

C7355B In-Duct IAQ Monitor

QUICK START GUIDE

ABOUT

This air quality monitor is specially designed for monitoring multiple air quality parameters in the air duct. The sensor is installed in the outdoor or return air duct. Real time monitoring parameters are particles (PM2.5 and PM10), carbon dioxide (CO₂), TVOC, air temperature and relative humidity.

The intelligent control algorithms built into the device help to minimize the influence of ambient temperature and humidity on the measured values. The device is packaged with numerous presets suitable for most commercial building requirements that enable quick and easy initial setup.

The device, with pilot tube inlet and outlet design instead of common air pump, adapts to a wider range of air speeds and ensures a long lifetime of usage. It provides Modbus RTU (RS-485) communication protocol and easily integrates with the building management system.

INITIAL SETUP

The device will power on when voltage is connected.

NOTE: Upon first use or re-use after long time shelving, the device should be continuously powered-on for at least 48 hours to ensure stable output of all measured values.

LIGHT INDICATION

The bottom right side of the device is the indicator area. For this monitor (Part number: C7355B1052), only refer to the ON and SCALE indicators.

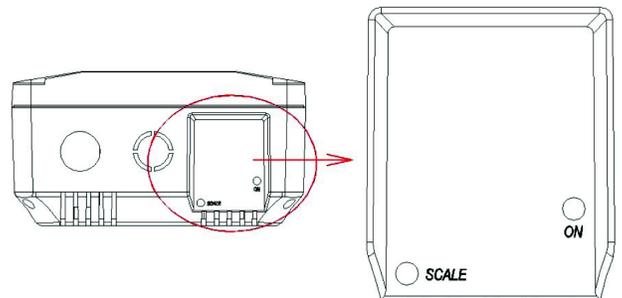


Fig. 1. Indicator Lights.

○ ON	When the power is on, it will illuminate to indicate the device is working. Otherwise, the device is faulty.
○ SCALE	This light indicates the one minute average value of PM2.5, and changes color depending on concentration. When PM2.5 < 35 µg/m ³ green light on 35–75 µg/m ³ yellow light on > 75 µg/m ³ red light on

COMMUNICATION SETTINGS

Wired communication (Modbus RS-485) is available for the device. The wiring terminals are shown below for detailed wiring and installation, please refer to Mounting Instructions.



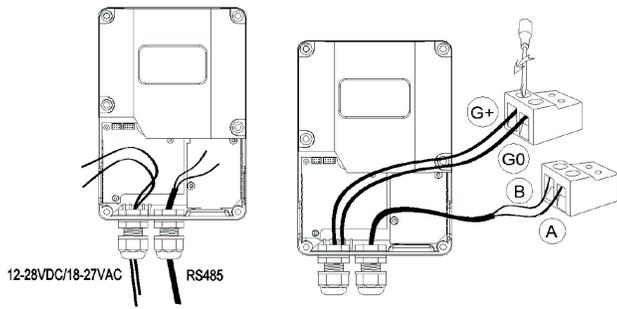


Fig. 2. Wiring Terminals.

SPECIFICATIONS

Part Number: C7355B1052

Detection Parameters: PM 2.5/PM 10, CO₂, TVOC, Temperature and RH

Operating Environment: 4 °F–140 °F (-20 °C–60 °C);
0–99%RH (non-condensing)

Storage Conditions: 32 °F–122 °F (0 °C–50 °C);
10–60%RH

Overall Dimension: 7.09 in x 4.92 in x 2.58 in
(180 mm x 125 mm x 65.5 mm)

Net weight: 1.87 lb (850 g)

Certification Standard: CE/FCC

Modbus Register Table

Mode: RTU (MSB First)

Baud Rate:

- 1-4800
- 2-9600
- 3-14400
- 4-19200
- 5-38400
- 6-56000
- 7-57600
- 8-115200
- default:** 2-9600bps

Start Bits: 1

Data Bits: 8

Stop Bits: 1 / 2
default: 1

Parity: None / Odd / Even
default: None

Register Map

Support Function code:

- 3 - Read Holding Registers
- 4 - Read Input Registers
- 6 - Write Single Register
- 16 - Write Multiple registers

Table 1. Modbus Register Table.

Starting Register Decimal	Data Description	Function	Read/Write	Quantity of Registers (2Bytes/16bit)	Format	Decimals	Data Range, Data Description	Default
0/1050	PM2.5 hourly average measurement	4	R	2	Float-Big Endian	1	0–1000.0 µg/m ³	
2/1052	PM10 hourly average measurement	4	R	2	Float-Big Endian	1	0–1000.0 µg/m ³	
8/1058	CO ₂ hourly average measurement	4	R	2	Float-Big Endian	0	0–5,000 ppm	
10/1060	TVOC hourly average measurement	4	R	2	Float-Big Endian	3	0–4000 mg/m ³	
12/1000	PM2.5 one minute average measurement	4	R	2	Float-Big Endian	1	0–1000.0 µg/m ³	
14/1002	PM10 one minute average measurement	4	R	2	Float-Big Endian	1	0–1000.0 µg/m ³	
16/1004	Temperature real-time measurement	4	R	2	Float-Big Endian	2	-20.00 °C–60.00 °C	
18/1006	Humidity real-time measurement	4	R	2	Float-Big Endian	2	0–100.00% RH	
20/1008	CO ₂ real-time measurement	4	R	2	Float-Big Endian	0	0–5,000 ppm	
22/1010	TVOC real-time measurement	4	R	2	Float-Big Endian	3	0–4000 mg/m ³	
24/1100	PM2.5 24-hour moving average measurement	4	R	2	Float-Big Endian	1	0–1000.0 µg/m ³	

Table 1. Modbus Register Table.

Starting Register Decimal	Data Description	Function	Read/Write	Quantity of Registers (2Bytes/16bit)	Format	Decimals	Data Range, Data Description	Default
26/1102	PM10 24-hour moving average measurement	4	R	2	Float-Big Endian	1	0–1000.0 $\mu\text{g}/\text{m}^3$	
32/1108	CO ₂ 24-hour moving average measurement	4	R	2	Float-Big Endian	0	0–5,000 ppm	
34/1110	TVOC 8-hour moving average measurement	4	R	2	Float-Big Endian	3	0–4000 mg/m^3	
1300	Primary pollutant 24-hour average measuring value (One of PM2.5/PM10/CO ₂ /TVOC) (Calculated based on 24-hour or 1-hour moving average measurement)	4	R	2	Float-Big Endian		1300	
1302	Primary pollutant type (One of PM2.5/PM10/CO ₂ /TVOC) (Calculated based on 24-hour or 1-hour moving average measurement)	4	R	1	INT16		1-PM25, 2-PM10, 3-CO ₂ ; 4-TVOC	
1303	Index level of the primary pollutant (One of PM2.5/PM10/CO ₂ /TVOC) (Calculated based on 24-hour or 1-hour moving average measurement)	4	R	1	INT16		Level 1-Excellent Level 3-Light pollution Level 4-Medium pollution Level 5-Heavy pollution Level 6-Severe pollution	
1304	AQI value of the primary pollutant (One of PM2.5/PM10/CO ₂ /TVOC) (Calculated based on 24-hour or 1-hour moving average measurement)	4	R	1	INT16		0–500	
1320	PM2.5 AQI value (Calculated based on 24-hour moving average measurement)	4	R	1	INT16		0–500	
1321	PM10 AQI value (Calculated based on 24-hour moving average measurement)	4	R	1	INT16		0–500	
1322	CO ₂ AQI value (Calculated based on 24-hour moving average measurement)	4	R	1	INT16		0–500	
1323	TVOC AQI value (Calculated based on 24-hour moving average measurement)	4	R	1	INT16		0–500	

Table 1. Modbus Register Table.

Starting Register Decimal	Data Description	Function	Read/Write	Quantity of Registers (2Bytes/16bit)	Format	Decimals	Data Range, Data Description	Default
1350	PM2.5 Pollution index level (Calculated based on 24-hour moving average measurement)	4	R	1	INT16		1-6	
1351	PM10 Pollution index level (Calculated based on 24-hour moving average measurement)	4	R	1	INT16		1-6	
1352	CO ₂ Pollution index level (Calculated based on 24-hour moving average measurement)	4	R	1	INT16		1-6	
1353	TVOC Pollution index level (Calculated based on 24-hour moving average measurement)	4	R	1	INT16		1-6	
78	3 color LED status	4	R	1	INT16		0-OFF, 1-Green, 2-Yellow, 3-Red	
0	Modbus Address	3/6	R/W	1	UINT16		1-247	1
1	Modbus rate (bps)	3/6	R/W	1	UINT16		1-4800, 2-9600, 3-14400, 4-19200, 5-38400, 6-56000, 7-57600, 8-115200	2
2	Modbus Parity check bit	3/6	R/W	1	UINT16		1-NONE, 1STOP_BIT, 2-NONE, 2STOP_BIT, 3-Odd, 1STOP_BIT, 4-Even, 1STOP_BIT	1
4	Temperature correction value	3/16	R/W	2	Float-Big Endian	2	-3.0-3.0 °C/ -6.0-6.0 °F	-2.0
6	Humidity correction value	3/16	R/W	2	Float-Big Endian	2	-5.0-5.0%RH	0
14	CO ₂ compensation value	3/16	R/W	2	Float-Big Endian	0	-300.0-300.0 ppm	0

In order to reserve the decimal part, the measuring value with decimal will be magnified 10/100/1000 times, marked as x10/x100/x1000.

Starting Register Decimal	Data Description	Function	Read/Write	Quantity of Registers (2Bytes/16bit)	Format	Decimals	Data Range, Data Description	Default
50/1175	PM2.5 hourly average measurement x10	4	R	1	UINT16	1	0-10000 corresponding to 0-1000.0 µg/m ³	
51/1176	PM10 hourly average measurement x10	4	R	1	UINT16	1	0-10000 corresponding to 0-1000.0 µg/m ³	
54/1179	CO ₂ hourly average measurement x1	4	R	1	UINT16	0	0-5000 corresponding to 0-5,000 ppm	
55/1180	TVOC hourly average measurement x1000	4	R	1	UINT16	3	0-3575 corresponding to -4.000 mg/m ³	

Starting Register Decimal	Data Description	Function	Read/Write	Quantity of Registers (2Bytes/16bit)	Format	Decimals	Data Range, Data Description	Default
56/1150	PM2.5 one minute average measurement x10	4	R	1	UINT16	1	0-10000 corresponding to 0-1000.0 µg/m ³	
57/1151	PM10 one minute average measurement x10	4	R	1	UINT16	1	0-10000 corresponding to 0-1000.0 µg/m ³	
58/1152	Temperature real-time measurement x100	4	R	1	INT16	2	-2000-6000 corresponding to -20.00 °C-60.00 °C	
59/1153	Humidity real-time measurement x100	4	R	1	UINT16	2	0-10000 corresponding to 0-100.00% RH	
60/1154	CO ₂ real-time measurement x1	4	R	1	UINT16	0	0-5000 corresponding to 0-5,000 ppm	
61/1155	TVOC real-time measurement x1000	4	R	1	UINT16	3	0-3575 corresponding to 0-4.000 mg/m ³	
62/1200	PM2.5 24-hour moving average measurement x10	4	R	1	UINT16	1	0-10000 corresponding to 0-1000.0 µg/m ³	
63/1201	PM10 24-hour moving average measurement x10	4	R	1	UINT16	1	0-10000 corresponding to 0-1000.0 µg/m ³	
66/1204	CO ₂ 24-hour moving average measurement x1	4	R	1	UINT16	0	0-5000 corresponding to 0-5,000 ppm	
67/1205	TVOC 24-hour moving average measurement x1000	4	R	1	UINT16	3	0-3575 corresponding to 0-4.000 mg/m ³	

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