# Dart Sensors WZ-S-K formaldehyde module

# Operation Manual

## ProSense Technologies Co., Ltd.

## Brief Introduction

WZ-S-K formaldehyde module from global detection expert DART SENSORS combines novel HCHO sensor with advanced electronic control technology, converting HCHO concentration into PPM directly. Once HCHO arrives at working electrode (anode) it is oxidized instantaneously to generate an electrical signal. The electrical signal is then acquired and processed by microprocessor into a PPM value and is output by standard digital signal. WZ-S-K HCHO module is pre-calibrated in the factory and can be integrated into your system directly.
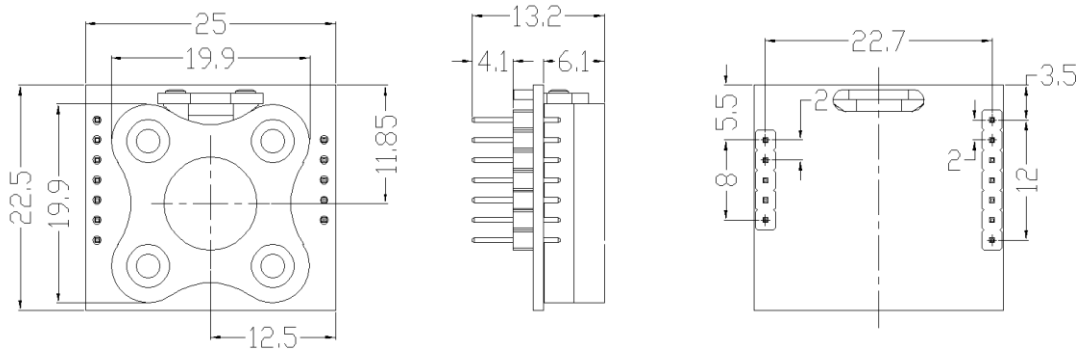
## Typical Applications

Smart home

Portable devices

Wearable devices

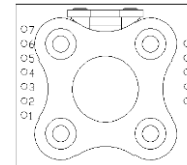Air conditioners

Air cleaners

... …

## Key Features

High precision

Fast response

Long service life

Low power consumption

High stability

Pre-calibrated

## Diagram

## Definition of Pins

| PIN | DEFINITION |
|------|------------|
| Pin1 | Vin(3.3 - 5V) |
| Pin2 | GND |
| Pin3 | RST |
| Pin4 | SW |
| Pin5 | NC |
| Pin6 | TXD |
| Pin7 | RD |

## Technical Specification

| MODEL | WZ-S-K |
|-------|--------|
| Detection Principle | Micro fuel cell |
| Detectable Gas | HCHO |
| Detection Range | 0-2ppm |
| Overload | 10ppm |
| Input Voltage | 5-7V |
| Warm up time | <3min |
| Response Time (T90) | <40S |
| Recovery Time (T10) | <60S |
| Resolution | 0.001ppm |
| Operating temperature range | -20℃～50℃ |
| Operating Humidity Range | 10％－90％RH（non-condense） |
| Lifetime | 5 years in air |
| Warranty Period | 12 months |
| Weight | 4g |

# Communication Protocol

> ## General Settings

Module makes use of serial communication.

Communication configuration parameters are:

| Baud rate | 9600 |
|-----------|------|
| Data bits | 8 bits |
| Stop bit | 1 bit |
| Parity bit | None |

> ## Communication Command

There are two communication types: active upload type and Q&A type. The default type is active upload and it sends gas concentration once every second. Commands are as follow:

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Start | Gas | Unit ppb | No decimal byte | Concentration (High byte) | Concentration (low byte) | Full range (high byte) | Full range (low byte) | Check sum |
| 0xFF | CH2O=0x17 | Ppb=0x04 | 0x00 | 0x00 | 0x25 | 0x07 | 0xD0 | 0x25 |

Gas concentration = concentration (high byte)*256 + concentration (low byte)

### Switch to Q&A mode：

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Start | Reserved | Switch command | Q&A | Reserved | Reserved | Reserved | Reserved | Checksum |
| 0xFF | 0x01 | 0x78 | 0x41 | 0x00 | 0x00 | 0x00 | 0x00 | 0x46 |

### Switch to active upload mode：

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Start | Reserved | Switch command | Active upload | Reserved | Reserved | Reserved | Reserved | Checksum |
| 0xFF | 0x01 | 0x78 | 0x40 | 0x00 | 0x00 | 0x00 | 0x00 | 0x47 |

### To read gas concentration：

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Start | Reserved | Command | Reserved | Reserved | Reserved | Reserved | Reserved | Checksum |
| 0xFF | 0x01 | 0x86 | 0x00 | 0x00 | 0x00 | 0x00 | 0x00 | 0x79 |

**To return:**

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Start | Command | Concentration (High byte) （ug/m3） | Concentration (low byte) （ug/m3） | Reserved | Reserved | Concentration (High byte) （ppb） | Concentration (low byte) （ppb） | Checksum |
| 0xFF | 0x86 | 0x00 | 0x2A | 0x00 | 0x00 | 0x00 | 0x20 | 0x30 |

Gas concentration = concentration (high byte)*256 + concentration (low byte)

# Checksum calibration

/*********************************************************************

*Function name：unsigned char FucCheckSum(uchar *i,ucharln)

*Function description：checksum calibration[Take Not(Byte1+Byte2+…Byte7) +1]

*Note：Take Not(Byte1+Byte2+…ByteX (X>2)

**********************************************************************/

```
unsigned char FucCheckSum(unsigned char *i, unsigned char ln)
{
    unsigned char j, tempq=0;
    i+=1;
    for(j=0; j<(ln-2); j++)
    {
        tempq+=*i;
        i++;
    }
    tempq=(~tempq)+1;
    return(tempq);
}
```

## Notes

➢ Avoid changing or moving sensor on the module.

➢ Avoid moving or changing electronic elements on PCB.

➢ Avoid exposure to organic vapour, organic solvent、high gas concentration.

➢ Protect from excessive vibration and shock.

No recommended for industrial safety/personal monitoring, refer to 2-FP5.

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