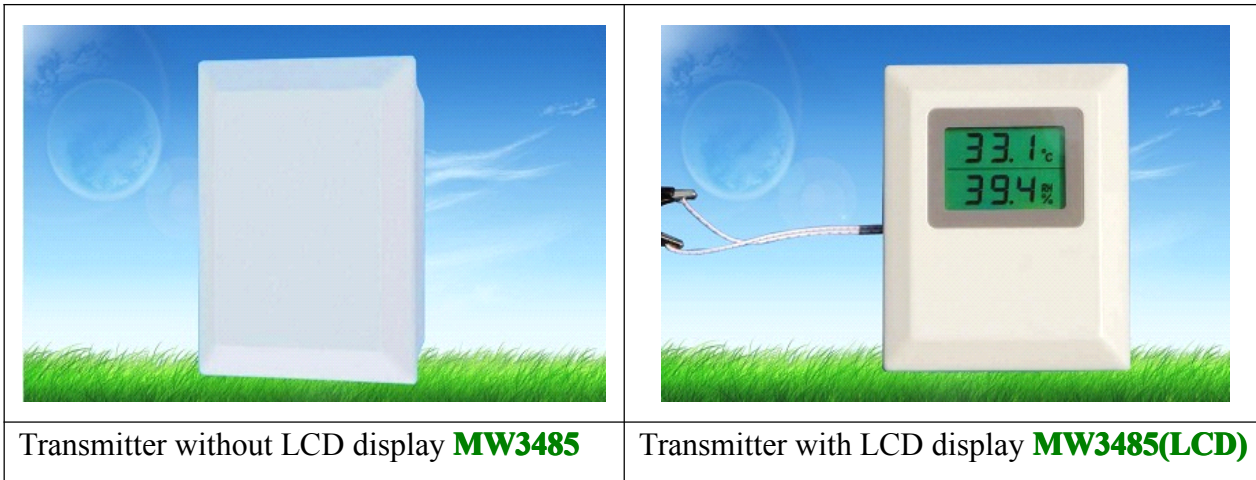


## Relative Humidity & Temperature Transmitter



### *Capacitive humidity & temperature transmitter for Wall Mounting*

#### 1. Description:

MaxDetect capacitive humidity element based humidity & temperature transmitters are ideal solution for detecting relative humidity and temperature in applications such as HVAC in residential & commercial buildings. The capacitance element based transmitter is one of the most stable transmitters available and no recalibration required, **transmitters are temperature compensated and calibrated.**

MaxDetect transmitters are problem-free and accurate with long-term reliability by apply unique HydroProbe® digital technology, our transmitters are developed for high-precision measurement of relative humidity & temperature and transmitters are available for wall & duct & outdoor mounting.

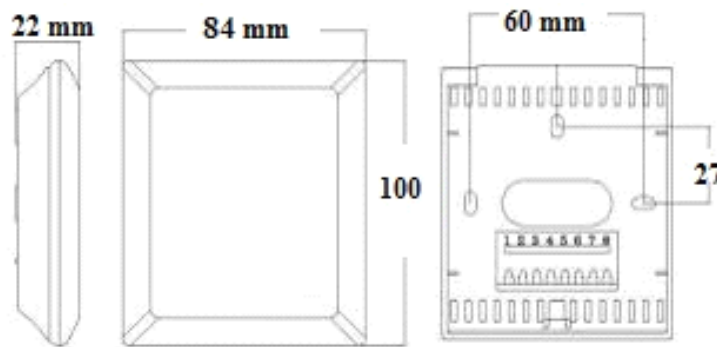
All MaxDetect transmitters can be equipped with industrial-class LCD display, LCD shows both humidity and temperature.

#### 2. Technical Specification:

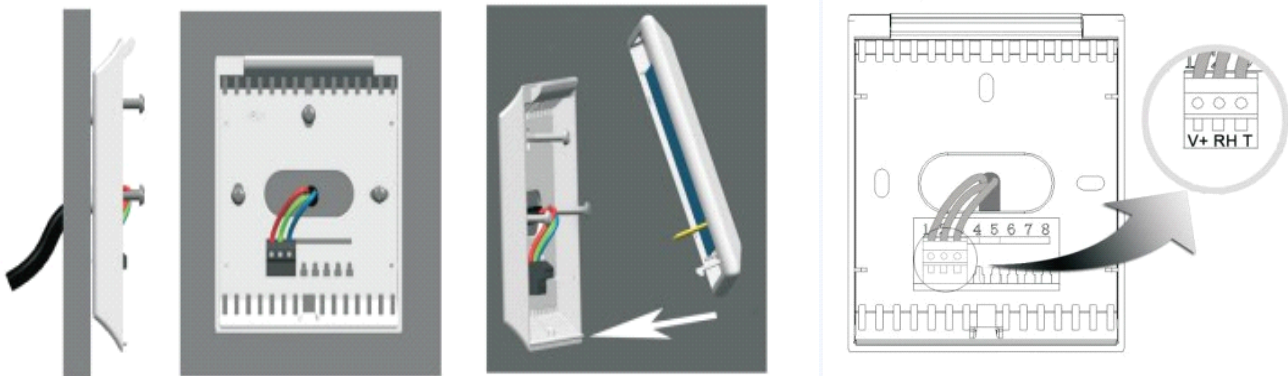
Power supply	12~36V DC
Humidity working range	0..100%RH
Humidity sensing element	Polymer humidity capacitor
Output for humidity	<b>RS485 signal</b>
Accuracy of humidity	+2%RH(10-95%RH, at 25Celsius); <+-5%RH(-40..80Celsius)
Repeatability	+0.3%RH
Hysteresis	+0.3%RH
Sensitivity for humidity	0.1%RH
Drift rate per year	+0.5%RH

Temperature sensor	DS18B20
Accuracy of temperature	+/-0.3Celsius(at 25Celsius)
Output for temperature	<b>RS485 signal</b>
Temperature working range	-40~80 Celsius
Storage temperature range	-40~80 Celsius
Case	ABS
Electrical connection	Screw connector( Max1.5mm <sup>2</sup> )

### 3. Dimensions:(unit---mm)

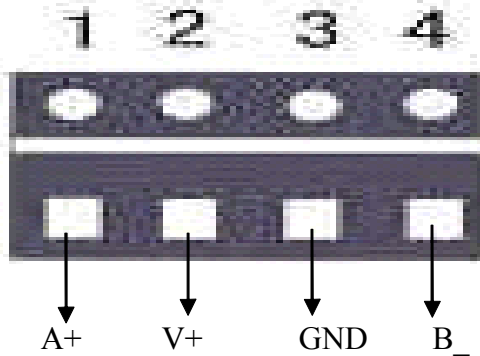


### 4. Wiring diagram

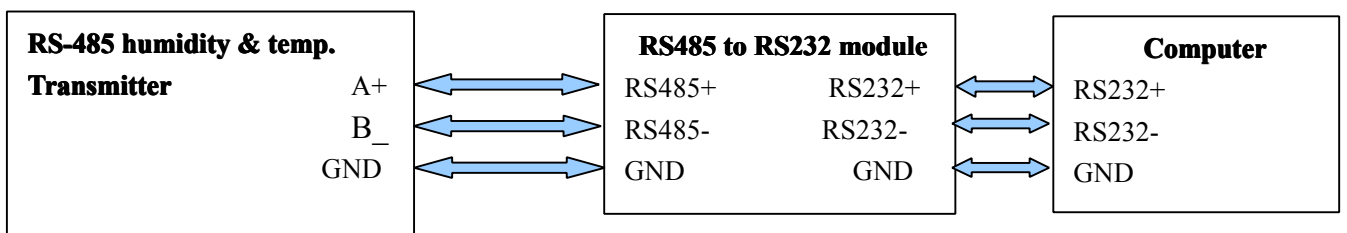


### 5. Electrical connection diagram

(1): Connection terminal



**(2): Connection diagram between humidity transmitter and computer(example diagram)**



## 6. Communication

(1). Set up Baud rate

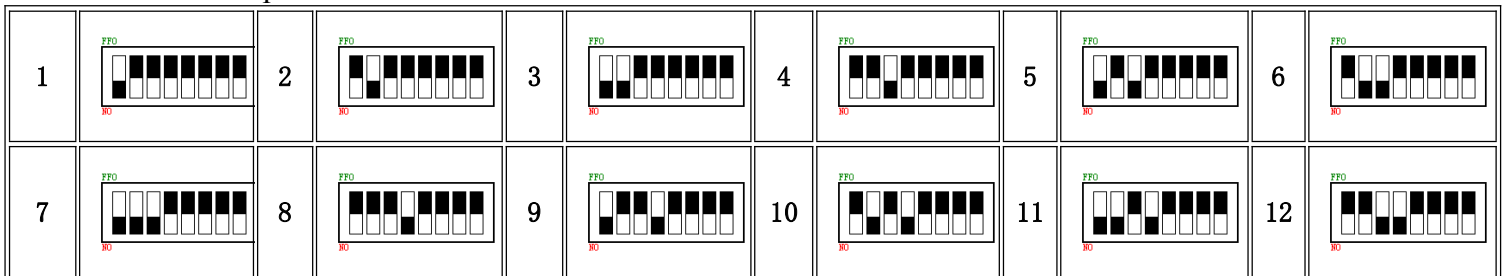
Set up Baud rate via dial switch located on humidity sensor's PCB board

1	2	bps
OFF/0	OFF/0	9600
ON/1	OFF/0	1200
OFF/0	ON/1	2400
ON/1	ON/1	19200

(2). Set up humidity sensor's address

Set up humidity sensor's address via dial switch located on humidity sensor's PCB board , from left side to right side, it's 8 7 6 5 4 3 2 1 on dial switch. Black color means to which direction the switch should be moved to

Below is example of address from 1 to 255.



13		14		15		16		17		18	
19		20		21		22		23		24	
25		26		27		28		29		30	
31		32		33		34		35		36	
37		38		39		40		41		42	
43		44		45		46		47		48	
49		50		51		52		53		54	
55		56		57		58		59		60	
61		62		63		64		65		66	
67		68		69		70		71		72	
73		74		75		76		77		78	
79		80		81		82		83		84	

85		86		87		88		89		90	
91		92		93		94		95		96	
97		98		99		100		101		102	
103		104		105		106		107		108	
109		110		111		112		113		114	
115		116		117		118		119		120	
121		122		123		124		125		126	
127		128		129		130		131		132	
133		134		135		136		137		138	
139		140		141		142		143		144	
145		146		147		148		149		150	
151		152		153		154		155		156	

157		158		159		160		161		162	
163		164		165		166		167		168	
169		170		171		172		173		174	
175		176		177		178		179		180	
181		182		183		184		185		186	
187		188		189		190		191		192	
193		194		195		196		197		198	
199		200		201		202		203		204	
205		206		207		208		209		210	
211		212		213		214		215		216	
217		218		219		220		221		222	
223		224		225		226		227		228	

229		230		231		232		233		234	
235		236		237		238		239		240	
241		242		243		244		245		246	
247		248		249		250		251		252	
253		254		255							

### (3). Data format from host

	First byte	Second byte	Third byte	Fourth byte	Fifth byte	Sixth byte	Seventh	Eighth byte
Function explanation	Address code	Function code	High 8 bits of register's address	Low 8 bits of register's address	High 8 bits of register's quantity	Low 8 bits of register's quantity	Low 8 bits of CRC code	High 8 bits of CRC code
Example of data from host	0X01	0X03	0X00	0X00	0X00	0X02	0XC4	0X0B

### (4). Data format from humidity & temp.sensor

	First byte	Second byte	Third byte	Fourth byte	Fifth byte	Sixth byte	Seventh byte	Eighth byte	Ninth byte
Function explanation	Address code	Function code	Length of data	High 8 bits of humidity data	Low 8 bits of humidity data	High 8 bits of temperature data	Low 8 bits of temperature data	Low 8 bits of CRC code	High 8 bits of CRC code
Example of data from sensor	0X01	0X03	0X04	0X02	0XB1	0X01	0X00	0XAA	0X3C

## (5). Calculation formula for the value of relative humidity & temperature

Take how to calculate the value of relative humidity for example:

First step: transform hexadecimal humidity data received from sensor to decimal data, here we define this decimal data as XXX.

Second step: Value of relative humidity=XXX divided by 10.

Such as: 
$$\frac{0X02B1}{\text{Hexadecimal system}} \rightarrow \frac{689}{\text{Decimal system}}$$
$$\text{RH} = 689/10 = 68.9\% \text{RH}$$

**The Calculation formula for temperature value is same as above formula.**

## (6). Program for the calculation of CRC code

```
unsigned short crc16(unsigned char *ptr, unsigned char len)
```

```
{
    unsigned short crc=0xFFFF;
    unsigned char i;
    while(len--)
    {
        crc ^=*ptr++;
        for(i=0;i<8;i++)
        {
            if(crc & 0x01)
            {
                crc>>=1;
                crc^=0xA001;
            }
            else
            {
                crc>>=1;
            }
        }
    }
    return crc;
}
```



## (7). Illustration of communication parameters

Communication parameters	Baud rate	Data bits	Stop bits	Parity bit
Value of communication meters	Set up Baud rate via dial switch	8	1	None

Regarding parity bit, our standard product's parity bit is None, but we offer OEM services to our customers. If customer need even parity bit, we can change the parity bit in our program to even parity bit easily for you. If customer need odd parity bit, we can change the parity bit in our program to odd parity bit easily for you.

### Cautions:

Proper location of the room humidity sensor is important to ensure accurate measurement of representative air samples. Place the sensor in an area of room that has good air circulation. Install the sensor on a flat interior surface, approximately 1.4m from the floor.

Avoid locating the sensor:

- \* Near heat sources, such as radiant heat from the sun, heat from appliances, or from concealed pipe or chimneys
- \* In areas subject to draft
- \* Behind doors, draperies, or in corners
- \* On walls having excessive vibration
- \* In corrosive environments such as swimming pools or hospital rooms