

# HMX350 Series

## Multifunctional Industrial Transmitter for Humidity / Temperature / Dew Point / Absolute Humidity / Enthalpy

HUMITRON® HMX350 series is easy to apply various environment HMX350 is not only available to measure humidity and temperature, but also can measure various water data such as absolute humidity, dew point temperature, enthalpy, dry bulb temperature, wet-bulb temperature, water vapor pressure, water vapor saturation pressure, mixing ratio, water activity, water activity in oil, mass of water in oil, etc. It is equipped with stability and resolution at the same time by adopting VFD module suitable for industry environment at display part.



### Measurable Parameter

Relative humidity	RH
Temperature	T
Dew-point temperature	Td
Frost-point temperature	Tf
Wet-bulb temperature	Tw
Water vapour pressure	Pw
Absolute humidity	A
Mixing ratio	x
Enthalpy	h
Water activity	Aw
Water activity in oil	Aw
Mass of Water in oil	ppm

### Various installation method and protection filter

HMX350W : Wall mounting Type  
 HMX350R : Remote Sensing probe (sensor separated from main body)  
 HMX350P : Remote Sensing probe for high pressure (Maximum 30 bars)  
 Probe length is possible to select among 133mm/223mm/338mm  
 It is possible to select between mesh filter for high humidity and standard sintered alloy filter.



Stainless Flange (MF-500)

### It is easy to compose networking using RS485 communication and Ethernet.

Can do remote data monitoring and data recording etc. by composing network easily through RS485 communication and Ethernet (install conversion module on outside).

### Built-in strong self-logging function

Self logging function saves temperature, humidity and dew point according to time interval which designed by user in non-volatile memory installed on inside of HMX350's main body. So that it is easy to analyze in computer utilizing HMX data logging and analysis software.

### Built-in multi channel 4~20mA output

HMX350 has built-in 4~20mA output of 3 points, it allows user to select measurement item needed transmission output user want to. In addition, user can set up output range.

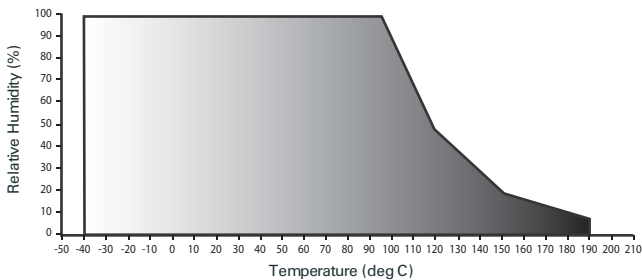
### Built-in relay output of 3 points

HMX350 has built-in relay output of 3 points, it allows user to select measurement item needed relay output user want to. In addition, user can set up contact output by various methods.

## Housing / Mounting Dimension

Relative humidity		
Working range	0...100%RH	
Accuracy (including hysteresis, non-linearity and repeatability)		
standard	±2.0%RH	±3.0%RH ( ≥90%RH )
special calibration	±1.0%RH	±2.0%RH ( ≥90%RH )
Response time with metal grid filter at 20°C / t90	≤ 15 Sec	
Temperature		
Working range	-40...190°C (Short term 200°C)	
Temperature sensor element	PT100 (Tolerance class A)	
Accuracy	±0.2 °C (Full Range)	
Transmission Outputs		
Three freely selectable and scaleable analogue outputs	4~20mA (3 points)	Load Resistance ≤ 500 ohm
Relay Outputs		
Three freely selectable relay outputs	contact (3 points)	
General		
Supply voltage	15...32V DC	
Current consumption	for 24V DC : type. 200mA	
Pressure range for pressure tight probe	0.01...30bar / 0.01...40bar	
System requirements for software	Windows 2000 or later, serial interface	
Housing / protection class	AI / IP65 (NEMA 4)	
Cable grand	Three M12(Aluminum)	
Electrical connection	screw therminals up to max. 1.5 mm <sup>2</sup> (AWG16)	
Working and storage temperature of electronics	-40...60°C	

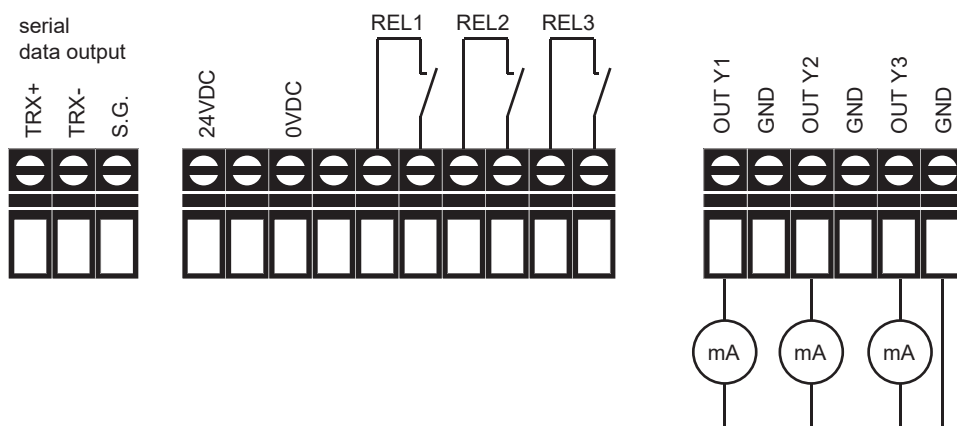
## Working Range



\* Gray area of graph in left is showing measurement area of humidity sensor.

\* If escape measurable area, we cannot guarantee for hygrometry accuracy

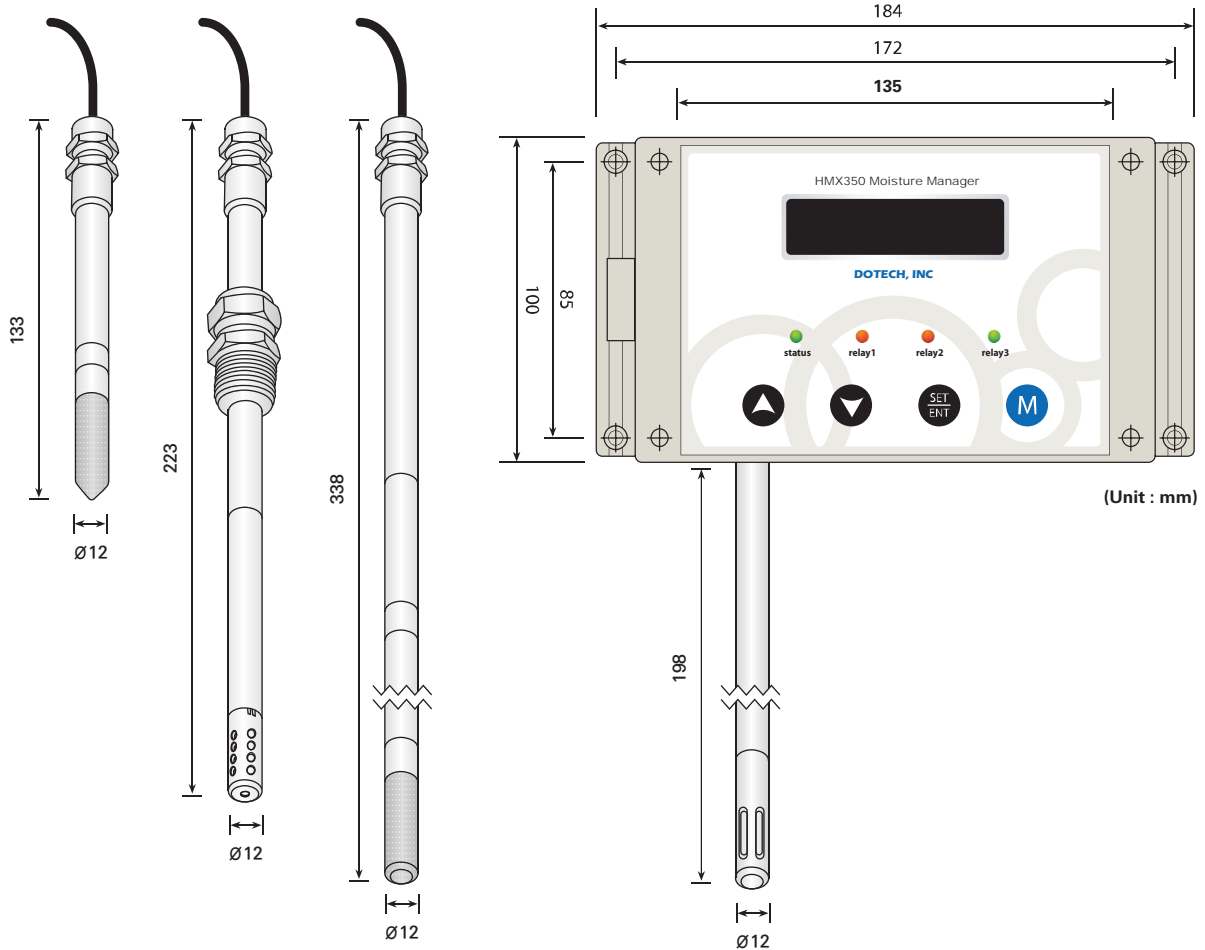
## Connection Diagram



## Ordering Guide

Series	Mount	Probe length	Cable length	Filter	Calibration	
HMX350	W					wall
	R					remote control sensing probe
	P					remote control sensing probe (pressure tight up to 40bar)
			-			for HMX350W type
			S			133mm
			M			223mm
			L			338mm
				2m		remote cable 2m
				5m		remote cable 5m
				10m		remote cable 10m
			20m		remote cable 20m	
				1		stainless steel sintered filter
				3		stainless steel mesh filter
				5		stainless steel grid filter
				7		stainless steel hole filter
					-	2% calibration standard
					CAI	1% calibration

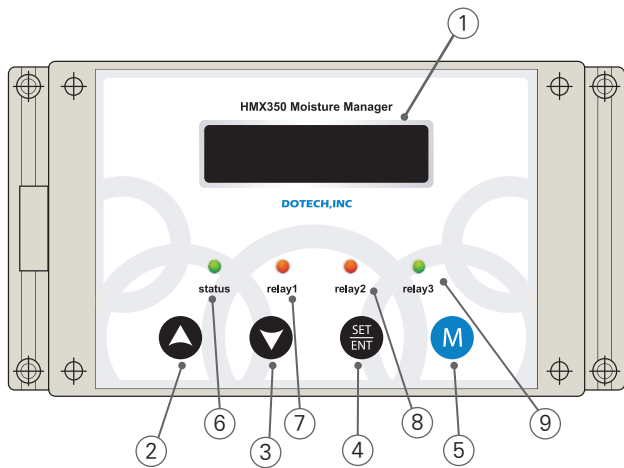
## Outline Dimension



## Parameter Table

*DISPLAY RELAY ANALOG LOG	DISPLAY *RELAY ANALOG LOG	DISPLAY RELAY ANALOG *LOG	*CAL. COMM TIME SETUP	CAL. COMM *TIME SETUP	CAL. COMM *SETUP	TIME SETUP
DISPLAY 1 upped rel-humidity	RELAY 1 source rel-humidity	ANALOG 1 source rel-humidity	TEMP Corrrrect 25.5°C 0.0	Date Set YEAR 09-04-26 09	Parameter Lock OFF	
DISPLAY 1 lower temperature	RELAY 1 type high active	ANALOG 1 4mA 0.0 %RH	RH Correct 50.0%RH 0.0	Date Set MONTH 09-04-26 04	Unit Set metric	
DISPLAY 2 upper dewpoint temp.	RELAY 1 above 70.0 %RH	ANALOG 1 20mA 100.0 %RH	TEMP Zero 25.5°C 00000	Date Set DAY 09-04-26 26	Ambient Pressure 1023hpa	
DISPLAY 2 lower data/time	RELAY 1 below 0.0 %RH	ANALOG 2 source temperature	TEMP Offset 25.5°C 0000	Time Set Hour 12:00:00 12	T-Sensor Filter 1 sec	
	RELAY 1 hysteresis 1.0 %RH	ANALOG 2 4mA -10.0°C	TEMP Span 25.5°C 00000	Time Set Minute 12:00:00 00	RH-Sensor Filter 1 sec	
	RELAY 2 source temperature	ANALOG 2 20mA 50.0°C	RH Zero < 30% 30.0% 00000	Time Set Sec 12:00:00 00	Analog Filter 001 sec	
	RELAY 2 type high active	ANALOG 3 source dewpoint temp.	RH Offset 50.0% 00000		Parameter Reset execution!!	
	RELAY 2 above 70.0°C	ANALOG 3 4mA -40.0°C				
	RELAY 2 below 0.0°C	ANALOG 3 20mA 60.0°C				
	RELAY 2 hysteresis 1.0°C					
	RELAY 3 source dewpoint temp.					
	RELAY 3 type high active					
	RELAY 3 above 70.0°C					
	RELAY 3 below 0.0°C					
	RELAY 3 hysteresis 1.0°C					

## Main Construction



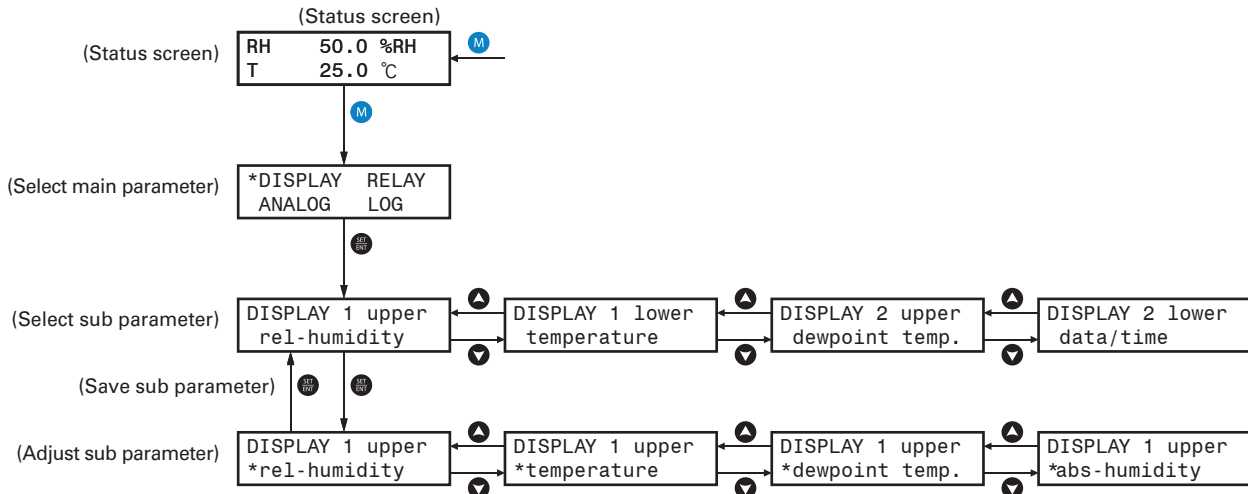
No.	Button & Lamp
1	VFD Display
2	Upward (Increase) Button
3	Downward (Decrease) Button
4	SET/ENTER Button
5	Mode Button
6	Status Lamp
7	Operation Lamp of Relay #1
8	Operation Lamp of Relay #2
9	Operation Lamp of Relay #3

## Measurable Parameter

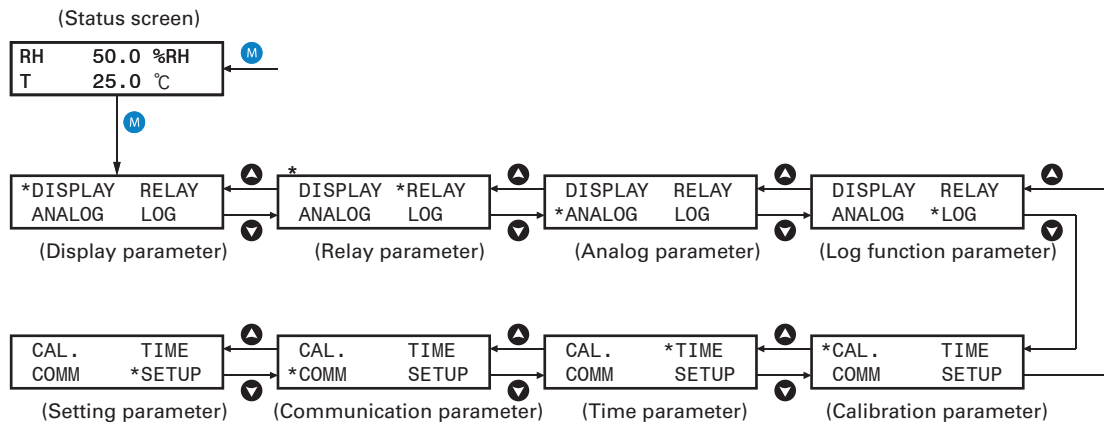
Symbol	Parameter	Measurement Range
RH	Relative Humidity	0 ~ 100%RH
T	Temperature	-50 ~ 200 °C
Td	Dewpoint Temperature	-40 ~ 120 °C
a	Absolute Humidity	0 ~ 700 g/m <sup>3</sup>
x	Mixing Ratio	0 ~ 999 g/kg
Pw	Water Vapor pressure	0 ~ 1100 mbar
Pws	Water Vapor Saturation Pressure	0 ~ 1100 mbar
h	Enthalpy	0 ~ 2800 kJ/kg
Aw	Water Activity	0.00 ~ 1.00 aw

Table 1. Measurable Parameter

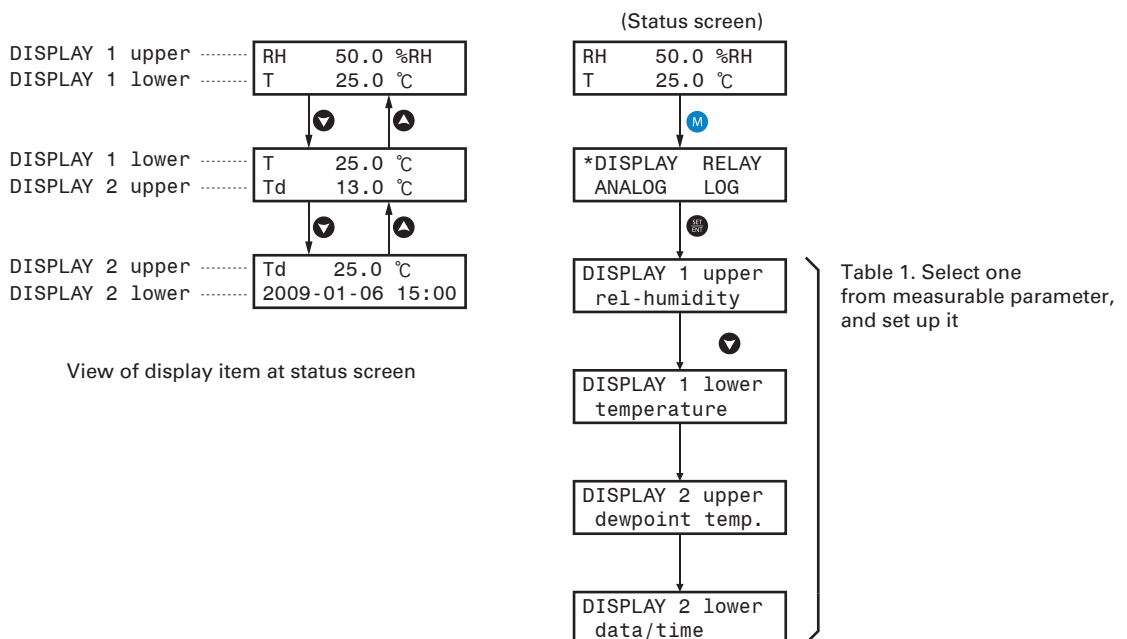
## Method of setting up parameter



## Construction of main parameter

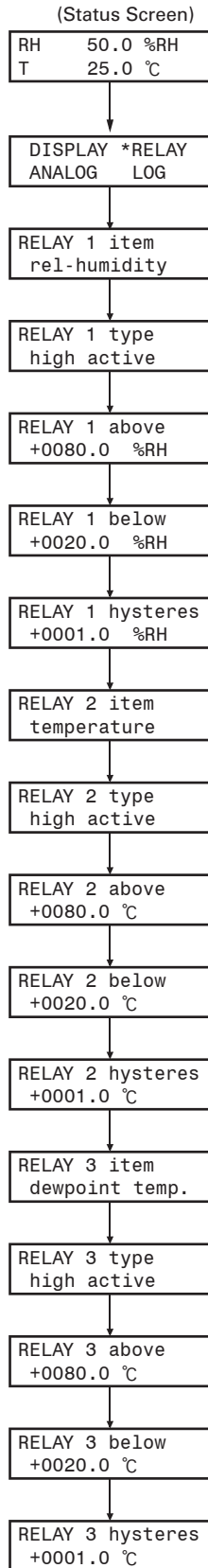


## Display parameter

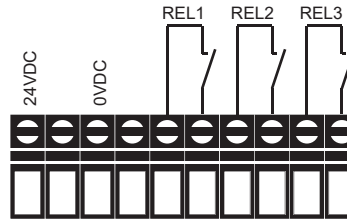


## Relay Parameter

A total of three (3) relays are available for HMX350, and user can use them by setting up relevant function on each of them. (But, the built-in relay should only be used as a signal of signal transmission purpose). - Please do not apply load directly.



### ● Wire connection of relay output part



### ● RELAY item (Select Relay Output Operation Source)

Table 1. Select one from measurable parameter, and set up it

### ● RELAY type (Select Relay Output Operation Type)

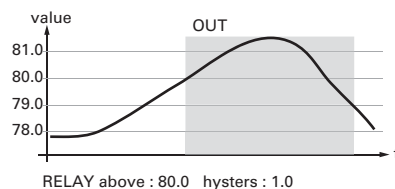
No.	Relay output operation type	Explanation of function
1	Always off	Not used (Always maintain in the off position)
2	High active	Maximum output
3	Low active	Minimum output
4	Inside active	Output when it remains within the range maximum and minimum
5	Outside active	Output when it remains beyond the range maximum and minimum
6	High latch	Maximum output (Manual return)
7	Low latch	Minimum output (Manual return)
8	Inside latch	Output when it remains within the range maximum and minimum (Manual return)
9	Outside latch	Output when it remains beyond the range maximum and minimum (Manual return)
10	Always on	Not used (Always remain in the on position)
11	Sensor fault	Output "On" at fault of temperature or humidity sensor
12	T sensor fault	Output "On" at fault of temperature sensor
13	RH sensor fault	Output "On" at fault of humidity sensor

- RELAY below : Input maximum value
- RELAY below : Input Minimum value
- RELAY below : Input hysteresis

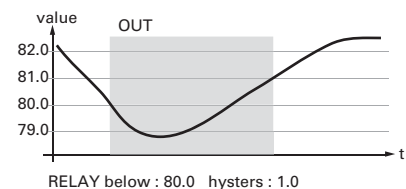
※ For reset of manual return output, please re-input the power.

### ● Explanation of the Relay operation

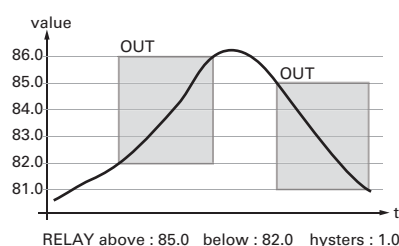
#### \* high active mode



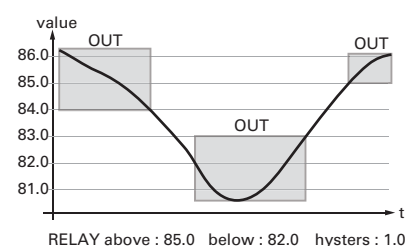
#### \* low active mode



#### \* inside active mode

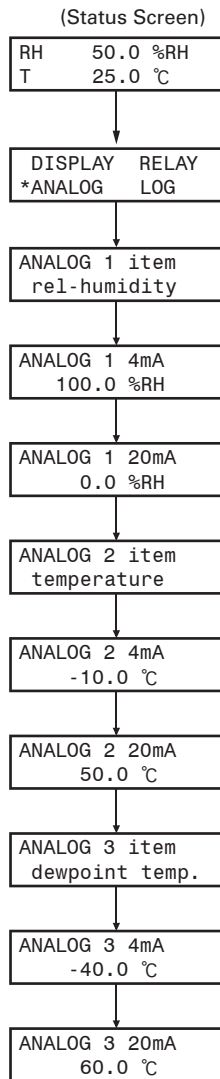


#### \* outside active mode

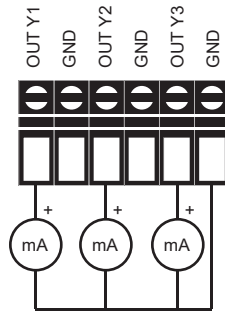


## Analog Parameter

HMX350 is prepared for transmission output of three 4-20mA in total, and user can use them by setting up relevant function on each of them.



### ● Wire connection for transmission output part



### ● ANALOG item (Select of transmission output source)

(Table 1. Select one from measurable parameter, and set up it)

### ● ANALOG 4mA (Select the range of transmission output : 4mA)

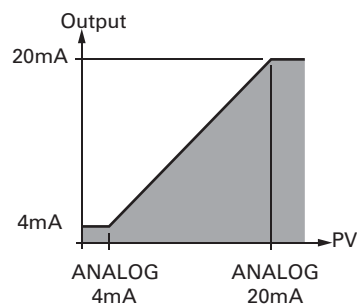
Input the transmission value when transmission output is 4mA.

### ● ANALOG 20mA (Select the range of transmission output : 20mA)

Input the transmission value when transmission output is 20mA.

### ● ANALOG CAL 4mA : Calibration Mode of 4mA output

### ● ANALOG CAL 20mA : Calibration Mode of 20mA output

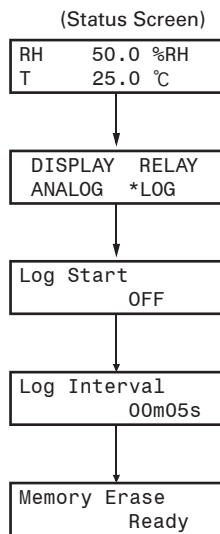




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## Log parameter

HMX350 is equipped with a high capacity nonvolatile memory, and it contains a data log function enabling for applying into various ranges and a long-term measurement.  
Stored all data can be analyzed installing the Dynaview HMX software which is provided separately to your PC.



- Log Start (Use the log function)

OFF : Stop the log function  
ON : Start the log function

- Log Interval (Log cycle)

00m00s : Set up log cycle at 00 minute and 00 second

Selectable log cycle

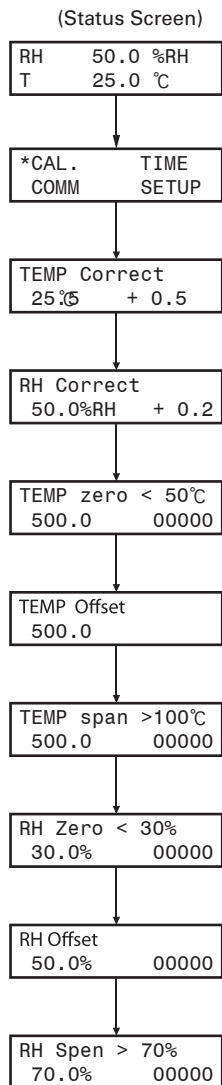
- 00m01s, 00m02s, 00m03s, 00m04s, 00m05s, 00m06s, 00m10s, 00m12, 00m15s, 00m20s, 00m30s
- 01m00s, 02m00s, 03m00s, 04m00s, 05m00s, 06m00s
- 10m00s, 12m00s, 15m00s, 20m00s, 30m00s, 60m00s

- Memory Erase

ready : Standby for memory erasure  
execution : Execution of memory erasure

## Correction parameter

As the product used for the environment where require high precision temperature and humidity measurement, HMX350 allows user to perform precision corrections easily as if we are having a dialog. These are the menus that can be used at the Correction Mode.



- TEMP Correct (Temperature Correction)

In case of an error has occurred in the temperature measurement value, it can be corrected by only inputting the error value. For example, if the error has occurred for +0.5, input -0.5 and have the error value makes at "0".

- RH Correct (Humidity Correction)

In case of an error has occurred in the humidity measurement value, it can be corrected by only inputting the error value. For example, if the error has occurred for -0.8%, input -0.8% and have the error value makes at "0".

- TEMP zero < 50°C (Correction For Low Temperature range)

It's used for making correction for the temperature ranges of lower than 50 °C. Carry out correction after maintaining it for 30 minutes in the environment where the temperature has been set at below 50 °C.

- TEMP offset (Temperature Correction Data Offset )

It's used for making correction by giving offset to the correction data when an error has occurred in the temperature measurement data. Carry out correction after maintaining it for 30 minutes in temperature environments of the fixed place

- TEMP span > 100°C (Correction For High Temperature range)

It's used for making correction for the temperature ranges of higher than 100 °C. Carry out correction after maintaining it for 30 minutes in the environment where the temperature has been set at higher than 100 °C.

- RH Zero < 30% (Correction For Low Humidity range)



It's used for making correction for the humidity ranges of lower than 30%. Carry out correction after maintaining it for 30 minutes in the environment where the humidity has been set at below 30 %.

- RH Offset (Humidity Correction Data Offset )

It's used for making correction by giving offset to the correction data when an error has occurred in the humidity measurement data. Carry out correction after maintaining it for 30 minutes in humidity environments of the fixed place.

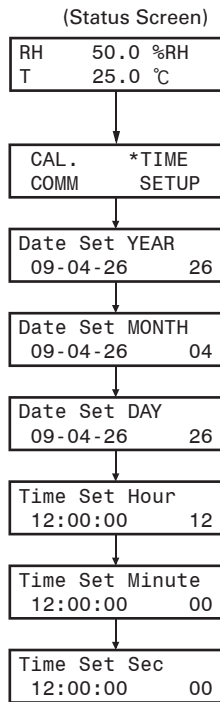
- RH Spen > 70% (Correction For High Humidity range)

It's used for making correction for the humidity ranges of higher than 70%. Carry out correction after maintaining it for 30 minutes in the environment where the humidity has been set at higher than 70%.

※ In order to enter into the Correction Mode, press both  and  at the same time.

## Time Parameter

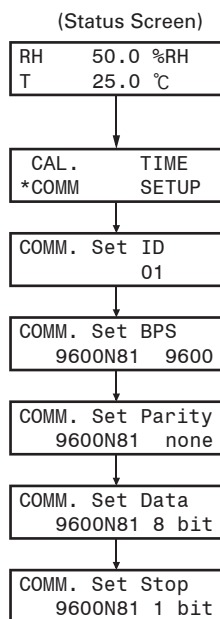
Even if the power for HMX350 itself is off, but the action of updating date and time is taken continuously, and the date and time is used as a basis for the data log function. The following is the menu used for setting up date and time.



- Date Set YEAR (Set up the current year)
- Date Set MONTH (Set up the current month)
- Date Set DAY (Set up the current date)
- Time Set Hour (Set up the current hour)
- Time Set Minute (Set up the current minute)
- Time Set Sec (Set up the current second)

## Communication Parameter

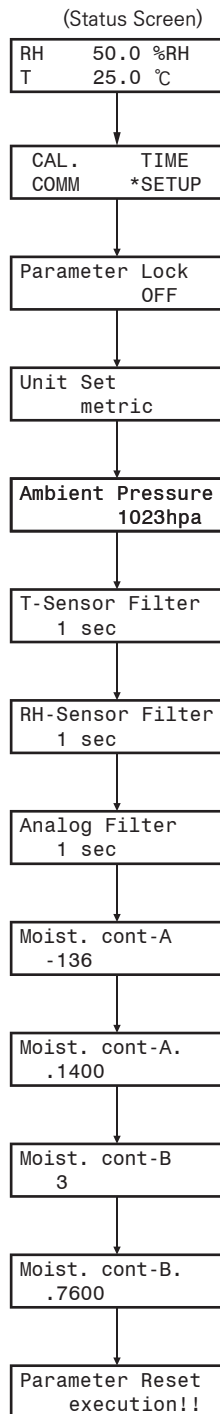
HMX350 applies basically with the RS485 Communication Interface, and for its protocol, it adopts the MODBUS RTU/ASCII method. In this menu, you can make sure and correct the parameter for communication function.



- COMM. Set ID (Set up communication ID)
  - COMM. Set ID (Set up communication ID)
- COMM. Set BPS (Set up communication BPS)
  - Select one among 4800, 9600, 19200, 38400, 57600, 11.5k(115200) BPS
- COMM. Set Parity (Set up communication Parity Bit)
  - Select one among none, odd, even
- COMM. Set Data (Set up communication Data Bit)
  - Select one among 7,8,9 Bit
- COMM. Set Stop (Set up communication Stop Bit)
  - Select one among 1,2 Bit

## SETUP (Set up parameter)

Even if the power for HMX350 itself is off, but the action of updating date and time is taken continuously, and the date and time is used as a basis for the data log function.  
The following is the menu used for setting up date and time.



### ● Parameter Lock (Parameter Locking Function)

OFF : Unlock  
ON : Lock

### ● Unit Set (Set up Unit Mode)

Set up the unit of the system.  
metric : Use the unit of metric  
non-metric : Use the unit of US

### ● Ambient Pressure (Set up the ambient pressure)

Set up the ambient pressure of sensor. In case of standby , input 1023hpa.  
Initial set value: 1023hpa

### ● T-Sensor Filter (Set up the temperature sensor input filter)

It is used when you set up input sensitivity of the temperature sensor,  
and the higher set value become more insensitive.  
Initial set value : 1 Sec

### ● RH-Sensor Filter (Set up the humidity sensor input filter)

It is used when you set up input sensitivity of the humidity sensor,  
and the higher set value become more insensitive.  
Initial set value : 1 Sec

### ● Analog Filter (Set up analog transmission output filter)

It is used when you set up the sensitivity of the 4-20mA transmission output ,  
and the higher set value become more insensitive.  
Initial set value : 1 Sec

### ● Moisture In Oil(ppm) Constant

$ppm = (aw * pow(10, A/T+B))$   
aw: Water Activity.  
T: Absolute Temperature(K)

### ● Parameter Reset (Parameter Initialization Function)

It is used when you make initialization of all the parameters those remain in the state at the time  
when the product released by the factory, except for the correction data.  
ready : Ready for parameter initialization.  
execution : Execution of parameter initialization