DLW-1000 Series

Mini weather station can measure weather information and air quality

Features

- Real-time measurement of outdoor weather information and hazardous gas decetion.
- Molding in one, can be matched with straight/ horizontal rod body, easy to install.
- Provide RS-485 and Ethernet (PoE) communication interfaces
- Support Modbus RTU/TCP, MQTT communication protocols
- Can be integrated with the WISE controller to set alarm notifications to keep you informed
- Combining with the ExoWISE, simple logic control settings

Introduction

Mini Automated Surface Observation Area:

The minimized sensors of gas/powder pollution are placed on PCB to help monitor the air quality index to identify the source of the contamination.

Positive and Negative Pressure Ventilation System:

Active ventilation produces the pressure difference between the inside and outside of the module, which causes airflow, creates turbulence, mixes the air evenly, and makes the data precise.

IP Protection Rating:

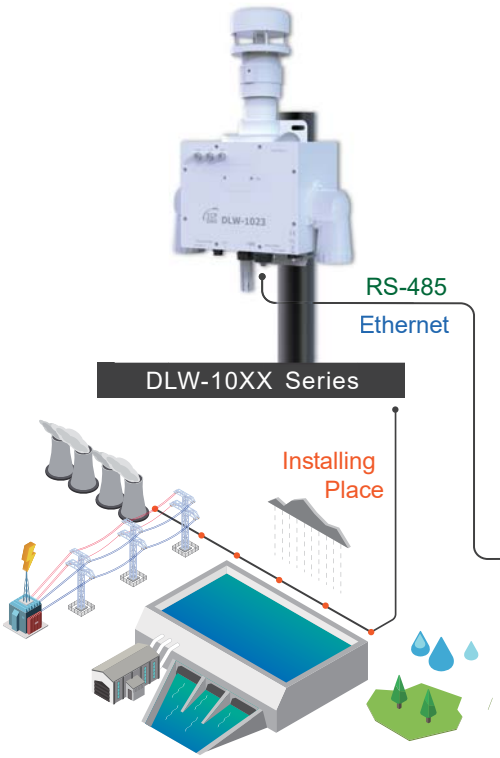
The system has an IP54 rating for the fan intake and output, which can withstand water ingress from a low angle during a storm. There is also a waterproof connector for RS-485 and Ethernet (supports PoE), to ensure the device will work in extreme conditions.

Replaceable Filter Patch:

The intake and output filters are replaceable. The 45ppi filter sponge prevents dust particles and cotton wool from entering, thereby extending the life of the gas sensor chips. It is only necessary to replace the filter patch by yourself during regular maintenance, which significantly reduces the repair times.

Applications

Outdoor Weather Information Visualization Solution



▲ Visualization Dashboard for Intelligent Monitoring

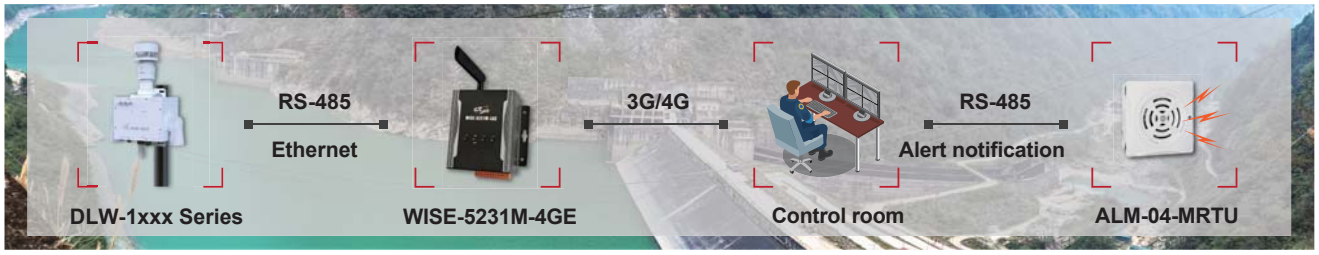
Edge Controller
WISE-5231M-4GE

• Combination of the IoT & agricultural technology

The minimized sensors of gas/powder pollution are placed on PCB to help monitor the air quality index to identify the source of the Smart greenhouses maintain the best growing conditions for plants through accurate data collection and a greenhouse temperature control system combined with an IoT system that automatically controls light, temperature, watering and CO_2 levels. In addition to providing gas and weather data for the green house IoT system , the DLW-1000 can be connected with PM-3133, a smart power meter that collects energy data, analyzes greenhouse energy consumption, and sends the data back to the control center via WISE-5231M-4GE, which realizes the combination between the IoT and agricultural technology.

• Data Management Solution for Multiple Stations

In India, since many tributaries of the Indus River Basin are separated by mountains, combined with a large territory of the country and poor communication infrastructure in some areas, domestic and industrial water use directly rely on pumping stations. Taking pumping stations in the drainage basin as a basis, ICP DAS uses WISE-5231M-4GE, equipped with edge computing and remote maintenance functions, to collect information on water quality, flow r ate, water level, and valve monitoring status in the pumping stations. Data can be sent back to the control center in Mumbai through the 4G, and users can simultaneously and remotely monitor and maintain their equipment. Besides this, adding a DLW-1000 to pumping stations enables users to notice climate changes in advance; coupled with the real-time data, the controlling center can evacuate the village before a heavy rainfall.



• Air quality and weather data collecting solution for marine affairs and ports

As marine transportation plays a critical role in international trade, marine affairs and ports have become indicators of productivity. For example, the Greenport Impact Assessment considers the air quality of a port in real-time. The monitored parameters are exhaust emissions from ships, machinery, and vehicles fueled by diesel or heavy fuel oil. The industrial DLW-1000 from ICP DAS can measure wind speed, wind direction, precipitation, illuminance, and collect data on H_2S, NOX, and PM2.5. We can implement air pollution reduction policies in commercial ports to improve air quality by combining weather data and A IS in adjacent seas surrounding Taiwan.

• Large scale farming

The DLW-1000 can collect data on temperature, humidity, precipitation, illumination, gas, wind direction and speed. The collected data helps to analyze the problem of planting, seedling, irrigation, fertilization of plants, protection from pests and diseases, and also helps to set up the traceability system to improve the quality of the crop. Meanwhile, the edge controller WISE-5231M-4GE, combined with the data acquisition monitoring module M-7000, can collect data from environmental sensors in remote areas where communication is poor. The combination of WISE-5231M-4GE and M-7000 integrates collection, transformation, and management of environmental data to demonstrate the convenience that smart farming brings.

• Industrial exhaust emissions monitoring

As the global trend of ESG becomes more and more popular, t o find a balance between energy and environmental protection, ICP DAS suggests strict control of exhaust emissions, together with the measurement and assessment of air quality. The DLW-1000 can be easily installed and used anywhere, for example, in smoke stacks with a height of 50 or 100m, as well as in storage tanks for raw materials in the petrochemical industry. In addition to temperature, humidity, pressure, illuminance, precipitation, wind direction and speed, the DLW-1000 also measures PM1/2.5/10, CO, CO_2 ,O_2 , NH_3 , H_2S, TVOC, HCHO and more. Combining the DL W-1000 with the edge controller WISE-5231M-4GE, you can perform logic control, data collection and transmission, device management, and problem reporting wirelessly.

System Specifications

Model		DLW-10XX/DLW-11XX/DLW-12XX/DLW-13XX	DLW-1000/DLW-1100/DLW-1200/DLW-1300
COM Ports			
Ports		1 x RS-485	
Baud Rate		1200 ~ 115200 bps	
Protocol		Modbus RTU	
Ethernet			
Ports		10/100 Base-TX, 8-Pin RJ-45 x1	
Security		Password and IP Filter	
Protocol		Modbus TCP and MQTT	
System			
Alarm		Weather Monitoring (Wind Speed, Wind Direction, Pressure, Illuminance, Sea Level, RH/T, Precipitation), Particulates, Gas Monitoring (CO, CO_2, HCHO, TVOC, NH_3, H_2S, O_2)	Weather Monitoring (Wind Speed, Wind Direction, Pressure, Illuminance, Sea Level, RH/T, Precipitation)
Real Time Clock		Yes	
Data Logger		Yes	
Relay Output		PhotoMOS Relay, Form A x 4, SPST 100 VDC@1A	
CPU Module			
Watchdog Timer		Yes, Module, Communication (Programmable)	
Power			
Powered from Terminal Block		+12 to +48 VDC	
Powered from PoE		IEEE 802.3af, Class 1 (48 V)	
Power Consumption	PoE	3.33 W Max	1.10 W Max
	Non-PoE	3.01 W Max	0.88 W Max
LED Indicators			
Status	PWR	Green for normal operation	
	Link	Green for the Ethernet-linked	
	Alarm	Red for an alarm condition	
Mechanical			
Installation		U-bolt or Wall Mounting	
Dimensions (mm)		288 x 122 x 389 (W x L x H)	190 x 134 x 389 (W x L x H)
Weight		2.45 kg	2.26 kg
Ingress Protection Rating		IP54	IP67
Environment			
Operating Temperature		-20 to +50°C	
Storage Temperature		-30 to +75°C	
Humidity		10% to 90% RH, Non-condensing	

DLW-1 0 X C

0 : Wind Speed, Wind Direction, RH/T, Pressure, illuminance, Sea Level

2 : PM1/2.5/10+Particle
3 : PM1/2.5/10+Particle+CO+CO_2
4 : NH_3
5 : O_2

1 : CO
2 : CO_2
3 : CO+CO_2
4 : HCHO+TVOC
5 : NH_3
6 : H_2S
7 : HCHO
8 : TVOC

DLW-10XX Series	Sensor												
	Weather Monitoring				Particulates	Gas Monitoring							
	Wind Speed Wind Direction Temperature Humidity	Pressure Sea Level	Illuminance	Precipitation	PM1 PM2.5 PM10 Particle	CO	CO_2	HCHO	TVOC	NH_3	H_2S	O_2	Mechanical
DLW-1000				-	-	-	-	-	-	-	-	-	A
DLW-1001				-	-	√	-	-	-	-	-	-	B
DLW-1002				-	-	-	√	-	-	-	-	-	
DLW-1003				-	-	√	√	-	-	-	-	-	
DLW-1004				-	-	-	-	√	√	-	-	-	
DLW-1005				-	-	-	-	-	-	√	-	-	
DLW-1006				-	-	-	-	-	-	-	√	-	
DLW-1007				-	-	-	-	√	-	-	-	-	
DLW-1008				-	-	-	-	-	√	-	-	-	
DLW-1020				-	√	-	-	-	-	-	-	-	
DLW-1021				-	√	√	-	-	-	-	-	-	
DLW-1022				-	√	-	√	-	-	-	-	-	
DLW-1023				-	√	√	√	-	-	-	-	-	
DLW-1024				-	√	-	-	√	√	-	-	-	
DLW-1025				-	√	-	-	-	-	√	-	-	
DLW-1026				-	√	-	-	-	-	-	√	-	
DLW-1027				-	√	-	-	√	-	-	-	-	
DLW-1028				-	√	-	-	-	√	-	-	-	
DLW-1034				-	√	√	√	√	√	-	-	-	
DLW-1035	√	√	√	-	√	√	√	-	-	√	-	-	
DLW-1036				-	√	√	√	-	-	-	√	-	
DLW-1037				-	√	√	√	√	-	-	-	-	
DLW-1038				-	√	√	√	-	√	-	-	-	
DLW-1041				-	-	√	-	-	-	√	-	-	
DLW-1042				-	-	-	√	-	-	√	-	-	
DLW-1043				-	-	√	√	-	-	√	-	-	
DLW-1044				-	-	-	-	√	√	√	-	-	
DLW-1046				-	-	-	-	-	-	√	√	-	
DLW-1047				-	-	-	-	√	-	√	-	-	
DLW-1048				-	-	-	-	-	√	√	-	-	
DLW-1050				-	-	-	-	-	-	-	-	√	
DLW-1051				-	-	√	-	-	-	-	-	√	
DLW-1052				-	-	-	√	-	-	-	-	√	
DLW-1053				-	-	√	√	-	-	-	-	√	
DLW-1054				-	-	-	-	√	√	-	-	√	
DLW-1055				-	-	-	-	-	-	√	-	√	
DLW-1056				-	-	-	-	-	-	-	√	√	
DLW-1057				-	-	-	-	√	-	-	-	√	
DLW-1058				-	-	-	-	-	√	-	-	√	

DLW-1 1 X C

1 : Wind Speed, Wind Direction, RH/T, Pressure, illuminance, Sea Level, Precipitation

2 : PM1/2.5/10+Particle
3 : PM1/2.5/10+Particle+CO+CO_2
4 : NH_3
5 : O_2

1 : CO
2 : CO_2
3 : CO+CO_2
4 : HCHO+TVOC
5 : NH_3
6 : H_2S
7 : HCHO
8 : TVOC

DLW-11XX Series	Sensor												
	Weather Monitoring				Particulates	Gas Monitoring							
	Wind Speed Wind Direction Temperature Humidity	Pressure Sea Level	Illuminance	Precipitation	PM1 PM2.5 PM10 Particle	CO	CO_2	HCHO	TVOC	NH_3	H_2S	O_2	Mechanical
DLW-1100					-	-	-	-	-	-	-	-	A
DLW-1101					-	√	-	-	-	-	-	-	
DLW-1102					-	-	√	-	-	-	-	-	
DLW-1103					-	√	√	-	-	-	-	-	
DLW-1104					-	-	-	√	√	-	-	-	
DLW-1105					-	-	-	-	-	√	-	-	
DLW-1106					-	-	-	-	-	-	√	-	
DLW-1107					-	-	-	√	-	-	-	-	
DLW-1108					-	-	-	-	√	-	-	-	
DLW-1120					√	-	-	-	-	-	-	-	
DLW-1121					√	√	-	-	-	-	-	-	
DLW-1122					√	-	√	-	-	-	-	-	
DLW-1123					√	√	√	-	-	-	-	-	
DLW-1124					√	-	-	√	√	-	-	-	
DLW-1125					√	-	-	-	-	√	-	-	
DLW-1126					√	-	-	-	-	-	√	-	
DLW-1127					√	-	-	√	-	-	-	-	
DLW-1128					√	-	-	-	√	-	-	-	
DLW-1134					√	√	√	√	√	-	-	-	
DLW-1135	√	√	√	√	√	√	√	-	-	√	-	-	B
DLW-1136					√	√	√	-	-	-	√	-	
DLW-1137					√	√	√	√	-	-	-	-	
DLW-1138					√	√	√	-	√	-	-	-	
DLW-1141					-	√	-	-	-	√	-	-	
DLW-1142					-	-	√	-	-	√	-	-	
DLW-1143					-	√	√	-	-	√	-	-	
DLW-1144					-	-	-	√	√	√	-	-	
DLW-1146					-	-	-	-	-	√	√	-	
DLW-1147					-	-	-	√	-	√	-	-	
DLW-1148					-	-	-	-	√	√	-	-	
DLW-1150					-	-	-	-	-	-	-	√	
DLW-1151					-	√	-	-	-	-	-	√	
DLW-1152					-	-	√	-	-	-	-	√	
DLW-1153					-	√	√	-	-	-	-	√	
DLW-1154					-	-	-	√	√	-	-	√	
DLW-1155					-	-	-	-	-	√	-	√	
DLW-1156					-	-	-	-	-	-	√	√	
DLW-1157					-	-	-	√	-	-	-	√	
DLW-1158					-	-	-	-	√	-	-	√	

DLW-1 2 X C

2 : Wind Speed, Wind Direction, RH/T

2 : PM1/2.5/10+Particle
3 : PM1/2.5/10+Particle+CO+CO_2
4 : NH_3
5 : O_2

1 : CO
2 : CO_2
3 : CO+CO_2
4 : HCHO+TVOC
5 : NH_3
6 : H_2S
7 : HCHO
8 : TVOC

DLW-12XX Series	Sensor												
	Weather Monitoring				Particulates	Gas Monitoring							
	Wind Speed Wind Direction Temperature Humidity	Pressure Sea Level	Illuminance	Precipitation	PM1 PM2.5 PM10 Particle	CO	CO_2	HCHO	TVOC	NH_3	H_2S	O_2	Mechanical
DLW-1200		-	-	-	-	-	-	-	-	-	-	-	C
DLW-1201		-	-	-	-	√	-	-	-	-	-	-	D
DLW-1202		-	-	-	-	-	√	-	-	-	-	-	
DLW-1203		-	-	-	-	√	√	-	-	-	-	-	
DLW-1204		-	-	-	-	-	-	√	√	-	-	-	
DLW-1205		-	-	-	-	-	-	-	-	√	-	-	
DLW-1206		-	-	-	-	-	-	-	-	-	√	-	
DLW-1207		-	-	-	-	-	-	√	-	-	-	-	
DLW-1208		-	-	-	-	-	-	-	√	-	-	-	
DLW-1220		-	-	-	√	-	-	-	-	-	-	-	
DLW-1221		-	-	-	√	√	-	-	-	-	-	-	
DLW-1222		-	-	-	√	-	√	-	-	-	-	-	
DLW-1223		-	-	-	√	√	√	-	-	-	-	-	
DLW-1224		-	-	-	√	-	-	√	√	-	-	-	
DLW-1225		-	-	-	√	-	-	-	-	√	-	-	
DLW-1226		-	-	-	√	-	-	-	-	-	√	-	
DLW-1227		-	-	-	√	-	-	√	-	-	-	-	
DLW-1228		-	-	-	√	-	-	-	√	-	-	-	
DLW-1234		-	-	-	√	√	√	√	√	-	-	-	
DLW-1235	√	-	-	-	√	√	√	-	-	√	-	-	
DLW-1236		-	-	-	√	√	√	-	-	-	√	-	
DLW-1237		-	-	-	√	√	√	√	-	-	-	-	
DLW-1238		-	-	-	√	√	√	-	√	-	-	-	
DLW-1241		-	-	-	-	√	-	-	-	√	-	-	
DLW-1242		-	-	-	-	-	√	-	-	√	-	-	
DLW-1243		-	-	-	-	√	√	-	-	√	-	-	
DLW-1244		-	-	-	-	-	-	√	√	√	-	-	
DLW-1246		-	-	-	-	-	-	-	-	√	√	-	
DLW-1247		-	-	-	-	-	-	√	-	√	-	-	
DLW-1248		-	-	-	-	-	-	-	√	√	-	-	
DLW-1250		-	-	-	-	-	-	-	-	-	-	√	
DLW-1251		-	-	-	-	√	-	-	-	-	-	√	
DLW-1252		-	-	-	-	-	√	-	-	-	-	√	
DLW-1253		-	-	-	-	√	√	-	-	-	-	√	
DLW-1254		-	-	-	-	-	-	√	√	-	-	√	
DLW-1255		-	-	-	-	-	-	-	-	√	-	√	
DLW-1256		-	-	-	-	-	-	-	-	-	√	√	
DLW-1257		-	-	-	-	-	-	√	-	-	-	√	
DLW-1258		-	-	-	-	-	-	-	√	-	-	√	

DLW-1 3 X C

3 : Wind Speed, Wind Direction, Sea Level, RH/T, Pressure,

2 : PM1/2.5/10+Particle
3 : PM1/2.5/10+Particle+CO+CO_2
4 : NH_3
5 : O_2

1 : CO
2 : CO_2
3 : CO+CO_2
4 : HCHO+TVOC
5 : NH_3
6 : H_2S
7 : HCHO
8 : TVOC

DLW-13XX Series	Sensor												
	Weather Monitoring				Particulates	Gas Monitoring							
	Wind Speed Wind Direction Temperature Humidity	Pressure Sea Level	Illuminance	Precipitation	PM1 PM2.5 PM10 Particle	CO	CO_2	HCHO	TVOC	NH_3	H_2S	O_2	Mechanical
DLW-1300			-	-	-	-	-	-	-	-	-	-	C
DLW-1301			-	-	-	√	-	-	-	-	-	-	D
DLW-1302			-	-	-	-	√	-	-	-	-	-	
DLW-1303			-	-	-	√	√	-	-	-	-	-	
DLW-1304			-	-	-	-	-	√	√	-	-	-	
DLW-1305			-	-	-	-	-	-	-	√	-	-	
DLW-1306			-	-	-	-	-	-	-	-	√	-	
DLW-1307			-	-	-	-	-	√	-	-	-	-	
DLW-1308			-	-	-	-	-	-	√	-	-	-	
DLW-1320			-	-	√	-	-	-	-	-	-	-	
DLW-1321			-	-	√	√	-	-	-	-	-	-	
DLW-1322			-	-	√	-	√	-	-	-	-	-	
DLW-1323			-	-	√	√	√	-	-	-	-	-	
DLW-1324			-	-	√	-	-	√	√	-	-	-	
DLW-1325			-	-	√	-	-	-	-	√	-	-	
DLW-1326			-	-	√	-	-	-	-	-	√	-	
DLW-1327			-	-	√	-	-	√	-	-	-	-	
DLW-1328			-	-	√	-	-	-	√	-	-	-	
DLW-1334			-	-	√	√	√	√	√	-	-	-	
DLW-1335	√	√	-	-	√	√	√	-	-	√	-	-	
DLW-1336			-	-	√	√	√	-	-	-	√	-	
DLW-1337			-	-	√	√	√	√	-	-	-	-	
DLW-1338			-	-	√	√	√	-	√	-	-	-	
DLW-1341			-	-	-	√	-	-	-	√	-	-	
DLW-1342			-	-	-	-	√	-	-	√	-	-	
DLW-1343			-	-	-	√	√	-	-	√	-	-	
DLW-1344			-	-	-	-	-	√	√	√	-	-	
DLW-1346			-	-	-	-	-	-	-	√	√	-	
DLW-1347			-	-	-	-	-	√	-	√	-	-	
DLW-1348			-	-	-	-	-	-	√	√	-	-	
DLW-1350			-	-	-	-	-	-	-	-	-	√	
DLW-1351			-	-	-	√	-	-	-	-	-	√	
DLW-1352			-	-	-	-	√	-	-	-	-	√	
DLW-1353			-	-	-	√	√	-	-	-	-	√	
DLW-1354			-	-	-	-	-	√	√	-	-	√	
DLW-1355			-	-	-	-	-	-	-	√	-	√	
DLW-1356			-	-	-	-	-	-	-	-	√	√	
DLW-1357			-	-	-	-	-	√	-	-	-	√	
DLW-1358			-	-	-	-	-	-	√	-	-	√	

I/O Specifications

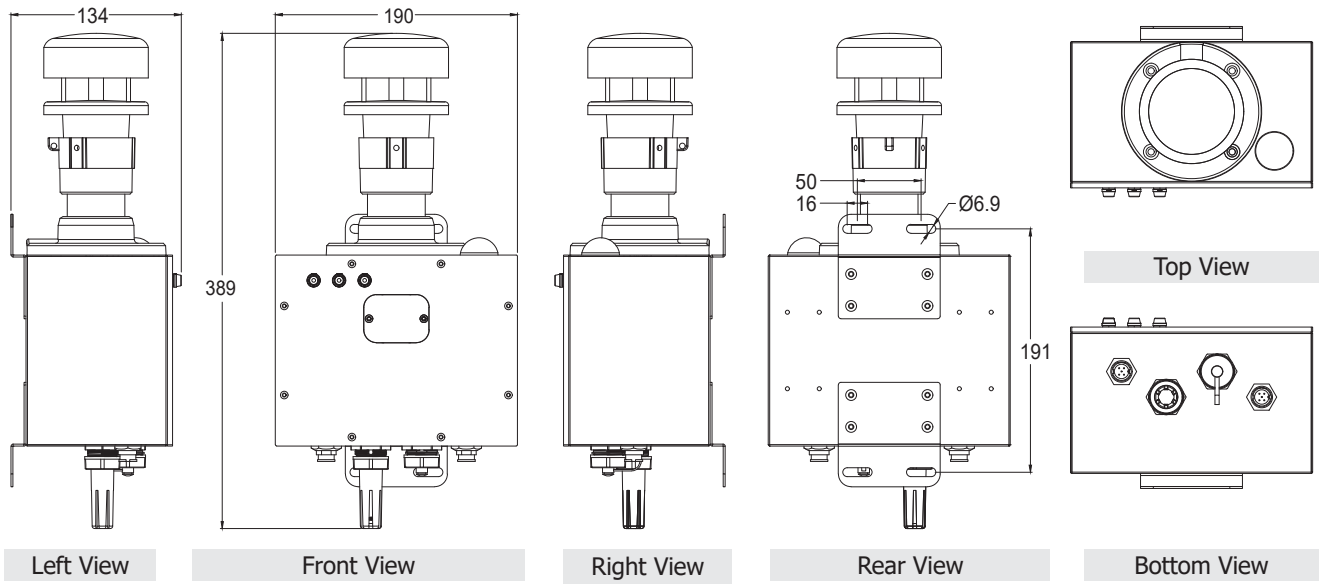
Mini Weather Station(Standard Specifications)						
Type of Sensor	**Range**	**Accuracy**	**Resolution**	**Response Time**	**Warn-up Time**	**Life Time**
Wind Speed	0 ~ 40 m/s	5%	0.01 m/s	-	-	-
Wind Direction	0 ~ 359°	<3°	1°	-	-	-
Pressure	300 ~ 1200 hPa	1 hPa	0.1 hPa	-	-	-
Precipitation	0 ~ 100 mm/hr	±10%	0.01 mm/hr	-	-	-
Sea Level	-50 ~ 9000 m	-	0.1 m	-	-	-
Temperature	-40 ~ +80℃	±0.5℃	0.1℃	-	-	10 years
Humidity	0 ~ 100%	±2%	0.1%	-	-	10 years
Illuminance	0 ~ 200,000 Lux	±5%	1 Lux	-	-	-
PM1.0/2.5/10 (Note1)	0 ~ 500 μg/m^3	±10%	1 μg/m^3	1 seconds	20 seconds	5 years

Note1 : The filter patch (FLT-C004) is replaceable

Mini Weather Station(Gas Sensor Optional Specifications)						
Gas Sensor	**Range**	**Accuracy**	**Resolution**	**Response Time**	**Warn-up Time**	**Life Time**
CO	0 ~ 1000 ppm (Electrochemical)	±5%	1 ppm	30 seconds	60 seconds	5 years
CO_2	0 ~ 9999 ppm (NDIR)	±3%	1 ppm	120 seconds	300 seconds	15 years
HCH0	0 ppb ~ 2000 ppb (Electrochemical)	±10%	1 ppb	≤ 60 seconds	180 seconds	3 years
TVOC	0 ppb ~ 60000 ppb (MEMS Metal Oxide)	±15%	1 ppb	60 seconds	180 seconds	5 years
NH_3	0 ~ 100 ppm (Electrochemical)	±5%	1 ppm	< 40 seconds	60 seconds	2 years
H_2S	0 ~ 100 ppm (Electrochemical)	±5%	1 ppm	< 30 seconds	60 seconds	2 years
O_2	0 ~ 25% (Luminescence for O2 sensor)	±2%	0.01%	< 30 seconds (typical)	120 seconds	5 years

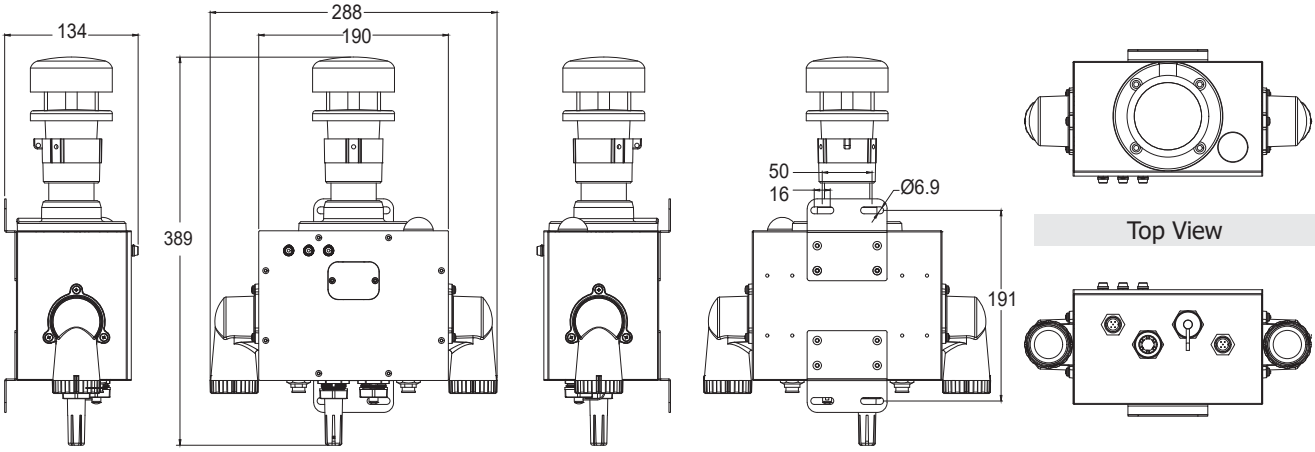
Dimensions (Units: mm)

DLW-1000/DLW-1100 **Type: A**



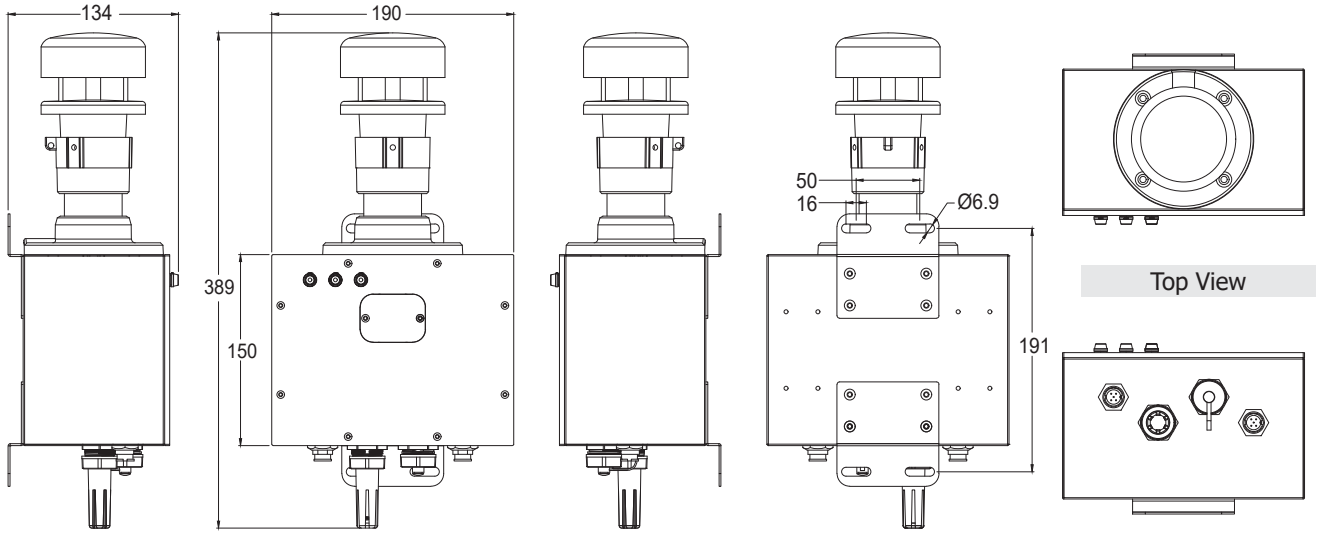
Dimensions (Units: mm)

DLW-10XX/DLW-11XX Type: B



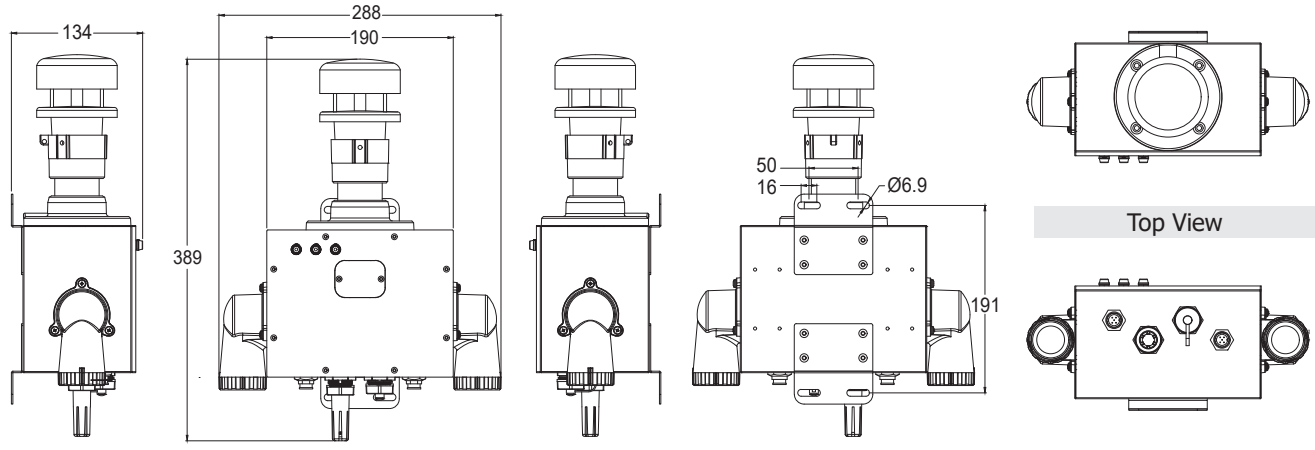
Left View | Front View | Right View | Rear View | Top View | Bottom View

DLW-1200/DLW-1300 Type: C



Left View | Front View | Right View | Rear View | Top View | Bottom View

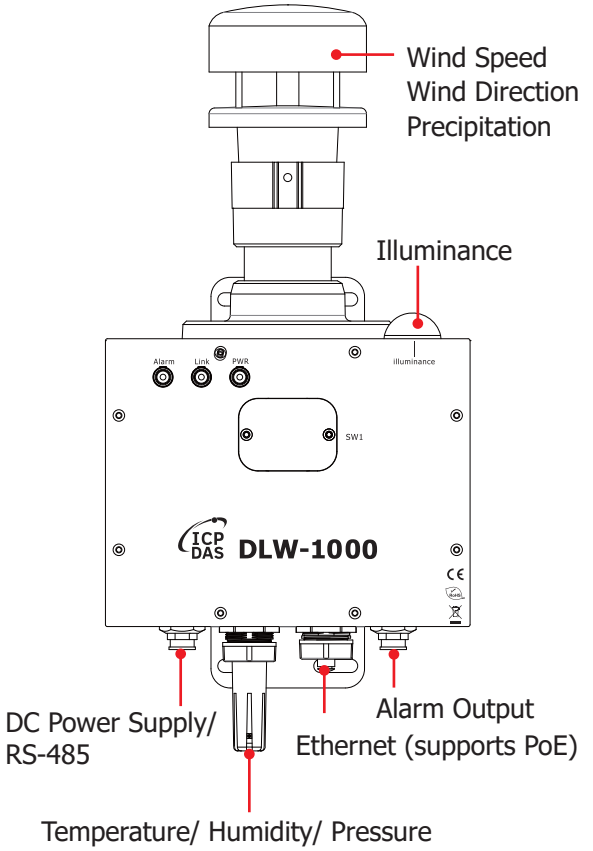
DLW-12xx/DLW-13xx Type: D



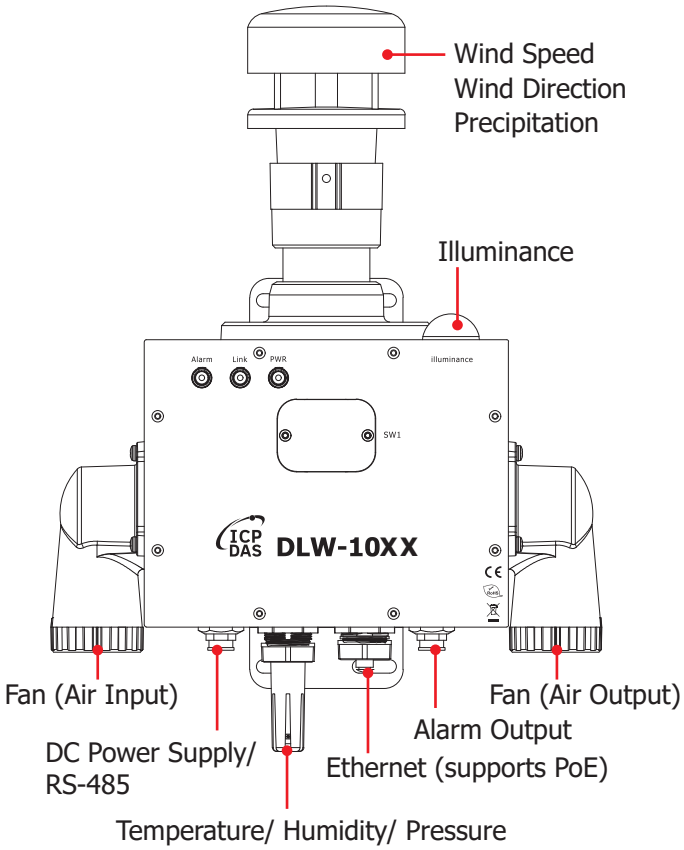
Left View | Front View | Right View | Rear View | Top View | Bottom View

Appearance

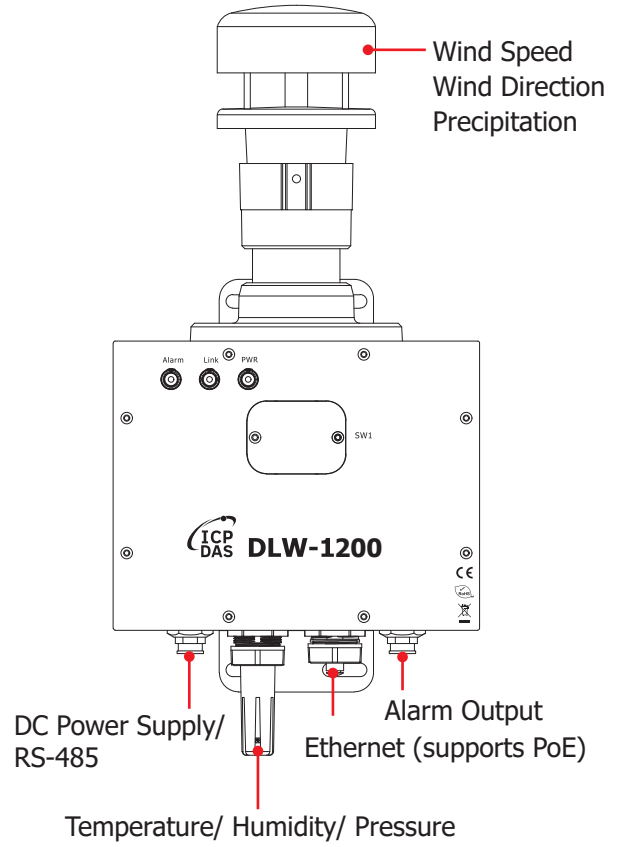
DLW-1000/DLW-1100 Type: A



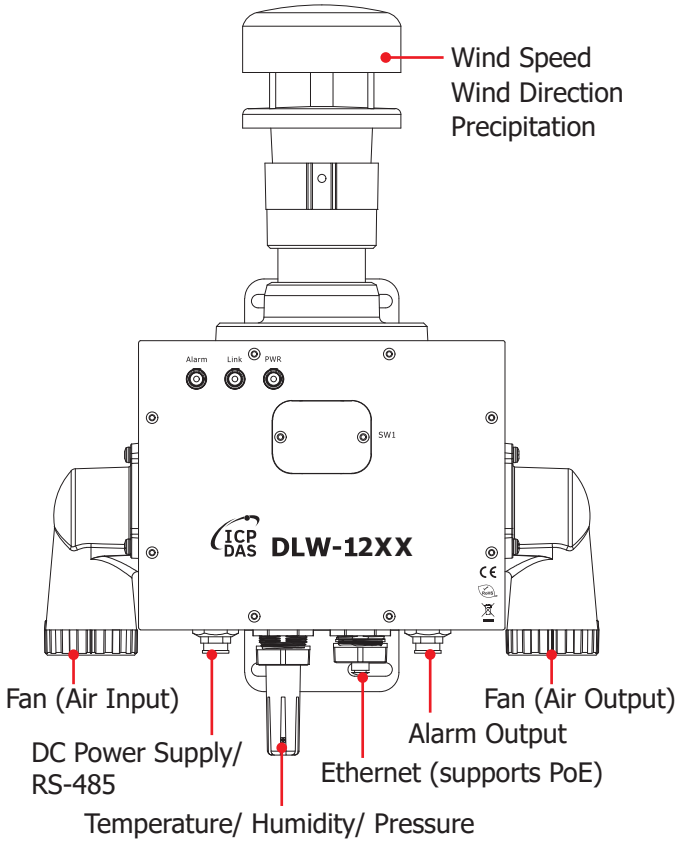
DLW-10XX/DLW-11XX Type: B



DLW-1200/DLW-1300 Type: C

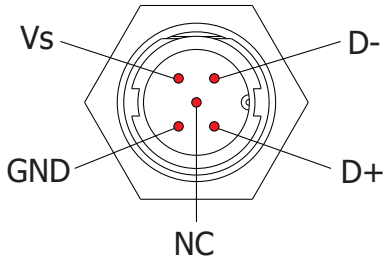


DLW-12xx/DLW-13xx Type: D

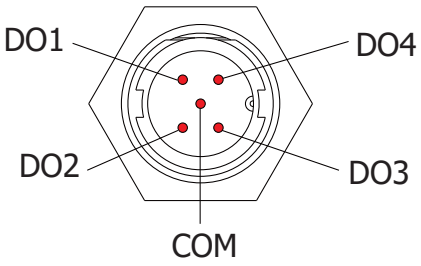


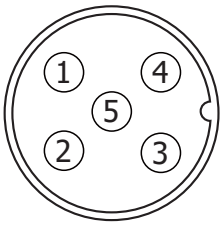
Pin Assignments

Power & RS-485

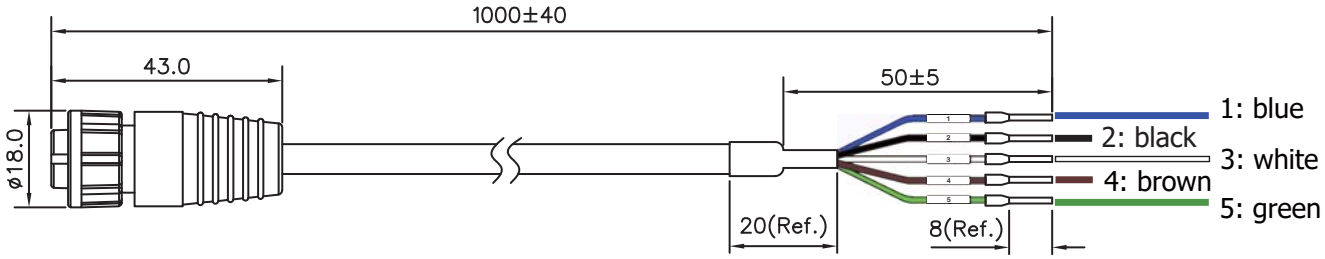


Alarm Output



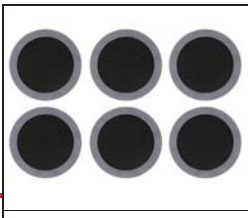


Standard Accessories



	CA-05BFFM-LL7A01
1m waterproof line	for Power & RS-485, Alarm Output

	4SASO-0001
IP67 RJ45 Plug	for Ethernet

	**FLT-C004**
Filter Patch	Replaceable Filter Patch (Circle) (1 Pack 6 Patches) Size: (OD :35.5 · ID:30.6)mm