



AQUAS
Simple. Reliable. Intelligent.

HMI

Multiparameter Controller

- Water Quality
- Flow
- Velocity
- Level
- Pressure

Cellular/Ethernet Communication .
All-in-One Solution .



ISO9001 Certification

With the headquarter based in Neihu Technology Park, Taipei, Taiwan, AQUAS Inc provides core technology and international marketing strategies. Supported by our own R&D department, we specialize in manufacturing advanced water quality analyzers, open channel flow meters, multiparameter loggers and controllers, etc. We support various kinds of applications such as flood precaution, sewer, drinking water, effluent, wastewater plant monitoring, surface water, ground water, water use in construction, and more intelligent water management and solution. Most of the AQUAS's products have received patents, and the related technologies are in the leading position in the world. Our products are famous as accurate, reliable, and easy to use. After more than 20 years of research and development, tens of thousands of AQUAS Online water monitoring systems have been successfully installed in cities around the world. AQUAS has been the market leader in the world in technologies such as optical water quality analyzer, radar ow meter and level meter, mobile communication, battery power supply and solid technics on robust SGS IP68 submersible enclosure. AQUAS has distributors in more than 60 countries around the world. Each of our employees will provide customers with the most efficient and high-quality services with their continuous efforts and strong faith.

The HMI series is a highly reliable and cost-effective multiparameter controller for data collection, communication, logging, alarming, control and analysis applications. It supports built-in I/Os, cellular, Ethernet, Bluetooth, RS485 and GPS module. The RS485 port is able to connect maximum up to 8 SMR digital sensors includes free chlorine, PH, ORP, temperature, conductivity, resistivity, dissolved oxygen, turbidity, salinity, suspended solid, ammonium, flow, velocity, level, pressure etc.

Advantages



- Built-in Flow Calculation Functions, Connects up to 2 Level or Flow Sensors to Measure Flow
- Waste Fluxes Calculation Function (Concentration X Flow) to Monitor Pollution Load
- Plug and Play Sensors Ports, Auto Connects up to 8 Water Quality Sensors
- Built-in Data Logger, Store up to 2,000,000 Log
- Support Cellular, WiFi and Ethernet Hot Backup Redundant Communication
- Battery Backup for 7 Days Non-Stop Monitoring during Power Outages
- Auto Store and Delivery Incomplete Uploads to Ensure No Data Loss
- Alarm Log, SMS Messaging and Control Outputs
- Support FTP, MQTT, RESTful, Modbus TCP, HART Protocols
- Simultaneously Upload Log and Alarm Files to Two Data Servers
- Standard OPC Server Software to Seamlessly Connect SCADA Software and Database
- Remote Data Collection with AQLIB Library for Windows or Linux
- Cloud Based Platform for Configuration, Operation, Monitoring, Alarm, Control and Data Analysis

Benefits

Borderless deployment without standard cabin, signal transmitter, communication module, power supply, surge isolation and lightning arrester

Eliminate power/networking/sensor/IO cabling, software configuration, engineering and infrastructure cost

Seamless connection to public or private network and software solutions

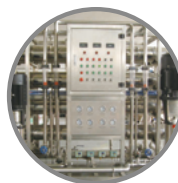
Easy to install, no need for calibration and quick connect within seconds. It is ideal for mobile operation

Low maintenance and troubleshooting. Minimizes running and operating cost

Applications



Water Treatment



Industrial Process



Wastewater Effluent



Drinking Water



Agriculture



Fishery



All-in-One, Autonomous Operation

- 4G/GPRS five band 800/850/1700/1900/2100 MHz cellular communication
- WiFi or Ethernet network communication
- Battery powered backup for 7 days non-stop monitoring



Robust Outdoor Construction

- IP66 or NEMA 4X protection enclosure
- Operating temperature: 0 to 65 °C
- Anti-corrosive IP68 connectors, ideal for harsh environment



Multiparameter Monitoring and Communication

- I/O modules: maximum 4 digital inputs, 2 relay outputs, 4 analog inputs, 2 analog outputs
- Sensors ports: connects MAX multiparameter water quality monitoring sonde, SMR digital sensors and I/O modules
- Multiple communication selections: cellular, WiFi, Ethernet, RS485
- Power supply: external power, internal battery, solar power and external battery box
- 2,000,000 log data storage capacity, including flow rate, flow volume, pressure, level, water quality...etc



Easy Setup and Installation

- Bluetooth cable-free operation and configuration
- Cellular/WiFi over the air cloud configuration, log data download and firmware update
- Setup operation parameters, monitor system, I/O, Sensors, battery voltage and capacity, cellular/GPS signal and calibrate sensor via AQCFG configuration software
- Cloud firmware upgrade via cellular, WiFi, Ethernet communication
- High gain antenna, ideal for water and wastewater monitoring applications



Smart Functions

- Scheduled and alarm communication: data collection, SMS, alarm notification, data upload, setting download, store and forward; accelerate upload frequency while alarming
- Log: periodical, event, alarm, transient pressure
- Configurable 4 levels alarm and actions including, SMS, alarm log and control outputs
- Programmable control functions: PID, Set Point, time table, alarm and manual ON/OFF
- Peer to peer communication for I/O and data exchange
- Intelligent battery power management and charge/discharge protection
- Forecast of battery operation days and early warning of low battery to avoid unpredicted breakdown



Auto Data Collection, Cloud Storage, WEB Operation and Monitoring

- Standard Modbus TCP protocol
- Central communication application programming library for field data collection and database integration
- Directly upload CSV format log files to user FTP servers
- Web configuration, operation, monitoring, alarm, control, Google Map display, statistical analysis, transient pressure analysis, trend, bar graph and tabular report functions
- Automatic registration and synchronization of device ID, serial number, alias, location and operation settings
- GPS and time logged together with I/O and sensor values
- SQL and MySQL database connection for development of application software
- Seamless SCADA software and database connectivity via OPC server
- Anytime and anywhere internet operation and monitoring
- Simultaneously upload data to 2 servers to build up dual database and operation centers



Security

- Battery is of the type proved to meet the requirements of UN38.3
- Login password access protection
- 128 bits cellular AES encryption to prevent unauthorized access
- GPS location deviation anti-theft alarm
- Secure cellular communication via virtual private network (VPN)

► Main Unit					
General					
CPU	32 bits, 600 MHz				
Dynamic Memory	128 MB				
Solids state memory	128 MB, expandable up to 64 GB; rotating, no log or setting data loss after power failure				
Real-time Clock	crystal controlled calendar clock with leap year adjustment; accuracy: 10 seconds per month; GPS and NTP server auto time synchronization, accuracy: 1 ms (GPS), 1~3 sec (NTP)				
Environment	protection: IP66 or NEMA 4X, operating temperature: 0~65 °C; operating humidity: 0~95% RH				
Safety	CE, FCC				
LCD Display					
Size	7"				
Resolution	800x480				
Colors	65536 colors				
Display	Sensor and I/O values, unit, system status, communication status, alarm				
Unit	Kgf/cm ² , mH2O, psi, KPa, bar, M, ft, in, CMH, CMS, M3, ft3, ppm, pH, °C, °F, µs/cm, ms/cm, NTU, ppm, ppt, ppb, %				
System Communication Port					
Function	configuration, diagnosis, data upload and download				
RS485 port (port 0)	15,200 bps, 8 bits, no parity, 1 stop bit, Modbus, RTU protocol				
Ethernet port	10/100 Mbps TCP protocol				
Housing					
Material	ABS				
Dimensions	144(W)×144(H)×122(D) mm (HMI1) ; 265(W)×234(H)×122(D) mm (HMI2)				
Weight	approx.0.8 Kg (HMI1) ; approx. 2 Kg (HMI2)				
► Function					
Data Collection	connects MAX multiparameter water quality monitoring sonde, SMR digital sensors and I/O modules				
Capacity	2 SMR digital sensors(HMI1); 8 SMR digital sensors(HMI2)				
Communication	data transmission; SMS alarm notification; data upload/download (interval: 5 secs~24 hours); store and forward; FTP				
Log	2,000,000 data values, rotating store; periodical, event, alarm				
Alarm	4 threshold levels; alarm action:relay output, SMS (up to 10 users at the same time), alarm log				
Control	time table, alarm output, manual ON/OFF, PID				
Security	login password, 128 bits cellular AES encryption				
► Power					
External Power					
Input Power	AC100-240 V, 50/60 Hz 1 A				
Power Consumption	20 W				
Internal Battery (BAT03-1S)					
Rechargeable 3.6 VDC 80AH lithium battery, Life: minimum 300 times charge/discharge cycles					
► Communication					
GPRS Module		Ethernet Module	4G Module		
Standard	GSM/GPRS	Data rate	10/100 Mbps	Standard	
Frquency	850/900/1800/1900 MHz	Isolation	1500 V DC	Frequency	800/850/900/1800/1900/2100/2400/2600 MHz
Antenna	3 dBi	Protocol	Proprietary or Modbus TCP	Antenna	1 dBi (internal); 1~3 dBi (external)
SIM Card	normal (15x25 mm)			SIM Card	Micro SIM (12x15mm)
Protocol	Proprietary or Modbus TCP			Protocol	Proprietary or Modbus TCP
WiFiModule		NBLoT Module			
Standard	IEEE 802.11b	Standard	LPWAN		
Data rate	Up to 11 M bps	Frequency	700/800/850/900 MHz		
Frequency	2.412~2.497 GHz	Antenna	1 dBi (internal); 1~3 dBi (external)		
Modulation	DSSS	SIM Card	Micro SIM (12x15 mm)		
Supported topologies	Star	Protocol	Proprietary or Modbus TCP		
Transmitter output	18 dBm				
Receive sensitivity	-83~-92 dBm				
Range	up to 1 Km				
Security	WPA/WPA2				
Protocol	Proprietary or Modbus TCP				

► Sensors Port (Port 1)

Functions	Device data collection, connecting MAX multiparameter water quality sonde, H2O water quality spectrometer, SMR digital sensors and I/O modules
Communication	RS485, 19,200bps, 8 bits, no parity, 1 stop bit
Surge protection	4000 VDC
Protocol	Modbus RTU

► I/O Port (Port 2) (HMI1)

Digital inputs		Digital outputs		Analog inputs	
Number of channels	2 counter or state inputs	Number of channels	2	Number of channels	2
Type	dry contact single ended input	Type	relay, 2 poles	Resolution	15 bits
Maximum operating frequency	100 Hz	Load	0.5 A 125 VAC; 1 A 30 VDC	Accuracy	0.025% FS
Minimum pulse width	2 msec	Maximum operating frequency	20 Hz	Signals	4 ~ 20 mA
Surge protection	4000 VDC	Surge protection	4000 VDC	Surge protection	4000 VDC

► I/O Port (Port 2) (HMI2)

Digital inputs		Digital outputs	
Number of channels	4 counter or state inputs	Number of channels	2
Type	dry contact single ended input	Type	relay, 2 poles
Maximum operating frequency	100 Hz	Load	0.5 A 125 VAC; 1 A 30 VDC
Minimum pulse width	2 msec	Maximum operating frequency	20 Hz
Surge protection	4000 VDC	Surge protection	4000 VDC

Analog inputs		Analog Outputs	
Number of channels	4	Number of channels	2
Resolution	15 bits	Resolution	12 bits
Accuracy	0.025% FS	Accuracy	0.1% FS
Signals	4 ~ 20 mA	Signals	4 ~ 20 mA
Surge protection	4000 VDC	Surge protection	4000 VDC
		Load resistor	500 ohms

Optional

► GPS Module

Frequency	1575.42 MHz
Position accuracy	5 m
Time accuracy	300 nsec
Antenna	28±3 dBi

► Barometer module

Measurement Range	0~1.3 Kg/cm ²
Operating temperature	-30 ~ 85 °C
Accuracy	± 0.0015 Kg/cm ²
Resolution	24 bits

► Solar Panel (PAN09)

Type	multi-crystalline silicon solar cell
Efficiency	17% (1000 W/m ² , 25 °C)
Max Power (Pmax)	20 Watts
Optimal operating voltage (Vop)	Max. 6 VDC±10%
Optimal operating current (Iop)	Max. 1 A ±10%
Open circuit voltage (Voc)	6.5 VDC ±10%
Short circuit current (Iss)	500 mA±10%
Operating temperature	-30 ~ 70 °C
Protection	IP67
Housing	Back - aluminum ; Front - reinforced glass
Dimension	540(W)x340(H)x35(D)mm

► Bluetooth Module

Functions	System configuration, diagnosis and data upload/ download
Standard	Standard Bluetooth 4.0
Data rate	up to 3 Mbps
Frequency	2.412~2.497 GHz
Range	up to 50 m
Antenna	1 dBi

► Accessories : SMR I/O Modules

Order No	Description	Order No	Description
SMR16-1	Analog input module (2 channels), 4~20 mA inputs	SMR18-1	Digital output module (8 channels), relay outputs
SMR17-4	Digital input module (8 channels), dry contact inputs	SMR19-1	Analog output module (2 channels), 4~20 mA outputs

► Accessories : Battery, Solar Panel, Cable, Antenna



Order No	Description
PAN09	IP67 6VDC, 20W Solar Panel
CAB06	Configuration cable (1.5 m, USB interface)
MSW01	Magnetic switch

Ordering Codes:

Mian Unit and I/O

4.3: LCD+ I/O Module (2 DI, 2 DO, 2 AI) _____ 1

7" LCD+ I/O Module (4 DI, 2 DO, 4 AI, 2 AO) _____ 2

Communication

RS485 _____ 0

GPRS _____ 1

WiFi _____ 2

Ethernet _____ 5

4G _____ 7

NB IoT _____ 8

Power

External Power (AC100-240 V, 0.5 A) _____ 0

Internal Battery (Rechargeable, 3.6 VDC 80 AH) _____ 1

Antenna

None _____ 0

External _____ 2

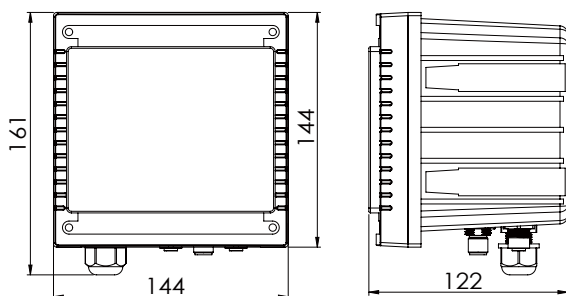
HMI □ - □ - □ - □

Optionals:

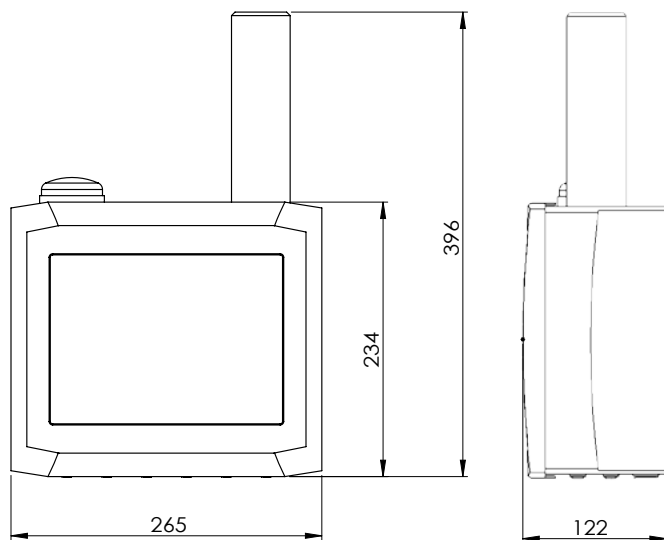
- GPS Module
- Barometer Pressure Module
- Communication redundancy: 2nd communication module for hot backup
- Alarm lamp

► Dimensions (unit: mm)

HMI1:



HMI2:



All performances are subject to the actual performance of the products sold by the company in the market, and are only applicable to the products of the company's brand sold by the company or its designated distributors. All the above data are from the internal test of Kaifa Water Resources, and the data may be biased due to different test environments. The manufacturer reserves the right to make changes to product performance, specifications, samples or designs without notice. All information has been carefully checked for accuracy. If there is any printing omission or there may be errors in translation, the company will not be responsible for the consequences.

AQUAS Inc.
 Taipei Office
 Add : 4F-2, No. 56, Ln. 321, Yangguang St., Neihu Dist.,
 Taipei City 11491, Taiwan. R.O.C.
 T : +886-2-8797-5358#240
 F : +886-2-2657-8926
 service@aquas.com.tw

Taichung Office
 Add : 5F, No. 190, Dadun 14th St., Nantun Dist.,
 Taichung City 408, Taiwan. R.O.C.
 T : +886-4-2326-8307

