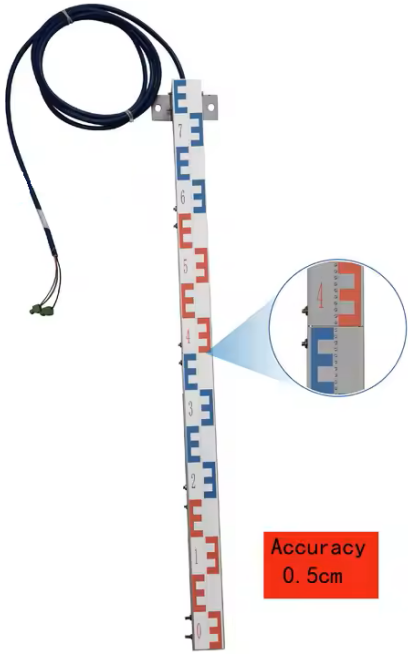


Technical Specification



Electronic Water Gauge

EL1-EWMF is a water level measuring device that integrates contact sensing sensor measurement and communication terminal. The electronic water level meter adopts Microsoft water conductivity principle to measure the water level data of the electrode, IP68 waterproof grade, support a variety of length splicing, the equipment has the characteristics of stable and reliable, easy installation, automatic measurement report, suitable for roads, culverts, reservoirs, rivers and lakes, agricultural canals, irrigation canals and other real-time liquid level measurement scenarios.

Measurement Method



Product Advantage

- ◆ Integrated molding: Integrated design, product molding, easy installation
- ◆ High stability: no mechanical moving parts, effectively prevent interference
- ◆ Long standby: Low power consumption design, long time online monitoring
- ◆ High precision: The expansion of the range does not lead to zero drift and temperature drift

Product Function

- ◆ Data acquisition: Collect water level information
- ◆ How it works: Water body is electrically conductive, stainless steel contacts
- ◆ Data storage: The collected data is processed, encoded, and stored
- ◆ LED linkage: It can control the early warning indication of the on-site LED guidance screen
- ◆ Image capture: It can control the on-site camera to take pictures and report
- ◆ Parameter settings: Support local parameter setting, remote parameter setting and Bluetooth wireless configuration
- ◆ Bluetooth communication: Built-in Bluetooth communication, which can realize on-site Bluetooth debugging
- ◆ Data reads: Remote and local historical data extraction is supported
- ◆ Remote control: Support local linkage and remote switch control output
- ◆ Communication method: It supports 2G/3G/4G and other communication modes, supports automatic switching of active and standby channels, and supports multi-center data transmission
- ◆ Communication module: Built-in full Netcom communication module
- ◆ power management: It has a solar charging control function
- ◆ Low-power operation: The operation supports low-power sleep operation mode
- ◆ Ingress protection: Protection level: anti-corrosion, pressure-resistant, watertight glue, IP68 protection level

Technical Parameter

Hardware System

Processor	32-bit ARM Cortex-M4 processor core
Data storage	16M

Water Level Parameters

Range	40cm、80cm、120cm、160cm、200cm、240cm、320cm、400cm、480cm、560cm - 960cm
Resolution	0.5cm
Accuracy	0.5cm

Wireless parameters

Module	Industrial-grade wireless modules
Standards and Frequency Bands	support: FDD-LTE, TDD-LTE, CDMA2000/EVDO, WCDMA, TD-SCDMA, GPRS/EDGE It can choose single-mode, multi-mode or network-wide communication
Theoretical bandwidth	FDD-LTE : downlink rate 150Mbps , uplink rate 50Mbps TDD-LTE : downlink rate 61Mbps , uplink rate 18Mbps WCDMA : downlink rate 42Mbps , uplink rate 5.76Mbps TD-SCDMA : downlink rate 2.8Mbps , uplink rate 2.2Mbps CDMA2000/EVDO : downlink rate 3.1Mbps , uplink rate 1.8Mbps GPRS/EDGE : 171.2kbps/384kbps
Transmit power	≤24 dBm
Receive sensitivity	≤-109 dBm

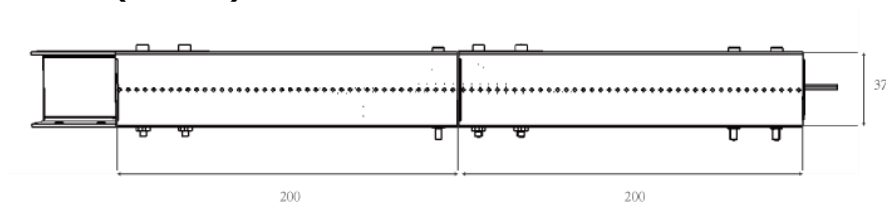
Interface type

Power connector	Industrial-grade terminal interface with built-in power supply reverse protection and over-current/over-voltage protection
Serial	1 RS232 interface and 1 RS485 interface Data bits: 5, 6, 7, 8 stop bits: 1, 1.5, 2 bits Check: no check, odd check, even check Serial port rate: 1200-115200bps
Application	1 set of analog input interface 12-bit AD, support 4-20mA current signal and 0-5V voltage signal
LED control	1 set of LED control interfaces
Camera interface	1 set of image camera data interface
Network	1 external RJ45 Ethernet interface (optional)
Bluetooth	Bluetooth communication: Built-in Bluetooth communication module
USIM card	Standard self-popping Micro Sim card holder, support 1.8V/3V USIM card, built-in 15KV ESD protection
Antenna	2 standard SMA female antenna interface with a characteristic impedance of 50 ohms

Mains supply

Standard power supply	DC 12V
Battery	Built-in 20000mAh lithium battery
Charge management	Built-in charging module, support solar panel (standard) floating charge power supply
Power supply range	DC 5-16V
Physical characteristics	
Enclosure protection	IP68 rating, enclosure and system safety isolation
Dimensions	Sensor: 45 × 37 × Measuring range (without mounting bracket) Mainframe: 206 × 174 × 66 mm (excluding antenna and mount)
Weight	Sensor: 20g/cm (range) + 500g (without mounting parts) Main unit: about 1250g (excluding antenna, mounting bracket and packaging)
Environmental parameters	
Operating temperature	-15°C ~ +55°C
Storage temperature	-35°C ~ +70°C
relative humidity	95%RH(no gel)

Product Size (mm)



Calculation Methodology



After installation, the channel is measured with a portable electromagnetic flow meter. This device detects water level and velocity. Other parameters (channel bottom width, top width, side slopes) are entered manually. The measured values are analyzed and averaged. The results are obtained. The EL1-EX-4G (Electronic Flow Meter) is then calibrated based on the results. All standart values are added to server. The ruler only gives water height and the EL1-EX-4G calculates discharge and stores it in the database.

Calculation Table									
Bottom Width(m) d	Water Depth(m) h	Side Slope m	Channel Slope j	Roughness Coefficients n	Wetted Area A=(d+2mh+d)/2*h	Wetted Perimeter C=d+2*SQRT((POWER(h,2)+ POWER((m*h),2)))	Hydraulic Radius R=A/C	Velocity V=1/nxPOWER(R,2/3) * SQRT(j)	Discharge Q=VxA
1	1	1.5	0.003	0.017	2.500	4.606	0.543	2.144	5.360
1	0.99	1.5	0.003	0.017	2.460	4.569	0.538	2.132	5.246
1	0.98	1.5	0.003	0.017	2.421	4.533	0.534	2.121	5.133
1	0.97	1.5	0.003	0.017	2.381	4.497	0.529	2.109	5.022
1	0.96	1.5	0.003	0.017	2.342	4.461	0.525	2.097	4.912
1	0.95	1.5	0.003	0.017	2.304	4.425	0.521	2.085	4.803
1	0.94	1.5	0.003	0.017	2.265	4.389	0.516	2.073	4.696
1	0.93	1.5	0.003	0.017	2.227	4.353	0.512	2.061	4.591
1	0.92	1.5	0.003	0.017	2.190	4.317	0.507	2.049	4.487
1	0.91	1.5	0.003	0.017	2.152	4.281	0.503	2.037	4.384
1	0.9	1.5	0.003	0.017	2.115	4.245	0.498	2.025	4.283
1	0.89	1.5	0.003	0.017	2.078	4.209	0.494	2.013	4.183
1	0.88	1.5	0.003	0.017	2.042	4.173	0.489	2.000	4.084
1	0.87	1.5	0.003	0.017	2.005	4.137	0.485	1.988	3.987
1	0.86	1.5	0.003	0.017	1.969	4.101	0.480	1.976	3.891
1	0.85	1.5	0.003	0.017	1.934	4.065	0.476	1.963	3.797
1	0.84	1.5	0.003	0.017	1.898	4.029	0.471	1.951	3.704
1	0.83	1.5	0.003	0.017	1.863	3.993	0.467	1.939	3.612
1	0.82	1.5	0.003	0.017	1.829	3.957	0.462	1.926	3.522
1	0.81	1.5	0.003	0.017	1.794	3.920	0.458	1.913	3.433
1	0.8	1.5	0.003	0.017	1.760	3.884	0.453	1.901	3.345
1	0.79	1.5	0.003	0.017	1.726	3.848	0.449	1.888	3.259
1	0.78	1.5	0.003	0.017	1.693	3.812	0.444	1.875	3.174
1	0.77	1.5	0.003	0.017	1.659	3.776	0.439	1.862	3.090
1	0.76	1.5	0.003	0.017	1.626	3.740	0.435	1.849	3.008
1	0.75	1.5	0.003	0.017	1.594	3.704	0.430	1.836	2.927
1	0.74	1.5	0.003	0.017	1.561	3.668	0.426	1.823	2.847
1	0.73	1.5	0.003	0.017	1.529	3.632	0.421	1.810	2.768
1	0.72	1.5	0.003	0.017	1.498	3.596	0.416	1.797	2.691
1	0.71	1.5	0.003	0.017	1.466	3.560	0.412	1.783	2.615
1	0.7	1.5	0.003	0.017	1.435	3.524	0.407	1.770	2.540
1	0.69	1.5	0.003	0.017	1.404	3.488	0.403	1.757	2.467
1	0.68	1.5	0.003	0.017	1.374	3.452	0.398	1.743	2.394
1	0.67	1.5	0.003	0.017	1.343	3.416	0.393	1.729	2.323
1	0.66	1.5	0.003	0.017	1.313	3.380	0.389	1.716	2.254
1	0.65	1.5	0.003	0.017	1.284	3.344	0.384	1.702	2.185
1	0.64	1.5	0.003	0.017	1.254	3.308	0.379	1.688	2.118
1	0.63	1.5	0.003	0.017	1.225	3.271	0.375	1.674	2.051
1	0.62	1.5	0.003	0.017	1.197	3.235	0.370	1.660	1.986
1	0.61	1.5	0.003	0.017	1.168	3.199	0.365	1.646	1.923
1	0.6	1.5	0.003	0.017	1.140	3.163	0.360	1.632	1.860
1	0.59	1.5	0.003	0.017	1.112	3.127	0.356	1.617	1.799
1	0.58	1.5	0.003	0.017	1.085	3.091	0.351	1.603	1.738
1	0.57	1.5	0.003	0.017	1.057	3.055	0.346	1.588	1.679
1	0.56	1.5	0.003	0.017	1.030	3.019	0.341	1.573	1.621
1	0.55	1.5	0.003	0.017	1.004	2.983	0.336	1.559	1.565
1	0.54	1.5	0.003	0.017	0.977	2.947	0.332	1.544	1.509
1	0.53	1.5	0.003	0.017	0.951	2.911	0.327	1.529	1.454
1	0.52	1.5	0.003	0.017	0.926	2.875	0.322	1.513	1.401
1	0.51	1.5	0.003	0.017	0.900	2.839	0.317	1.498	1.349
1	0.5	1.5	0.003	0.017	0.875	2.803	0.312	1.483	1.297
1	0.49	1.5	0.003	0.017	0.850	2.767	0.307	1.467	1.247
1	0.48	1.5	0.003	0.017	0.826	2.731	0.302	1.451	1.198
1	0.47	1.5	0.003	0.017	0.801	2.695	0.297	1.435	1.150
1	0.46	1.5	0.003	0.017	0.777	2.659	0.292	1.419	1.103

