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D Series

Contact GWR level measurement electronic module based on TDR

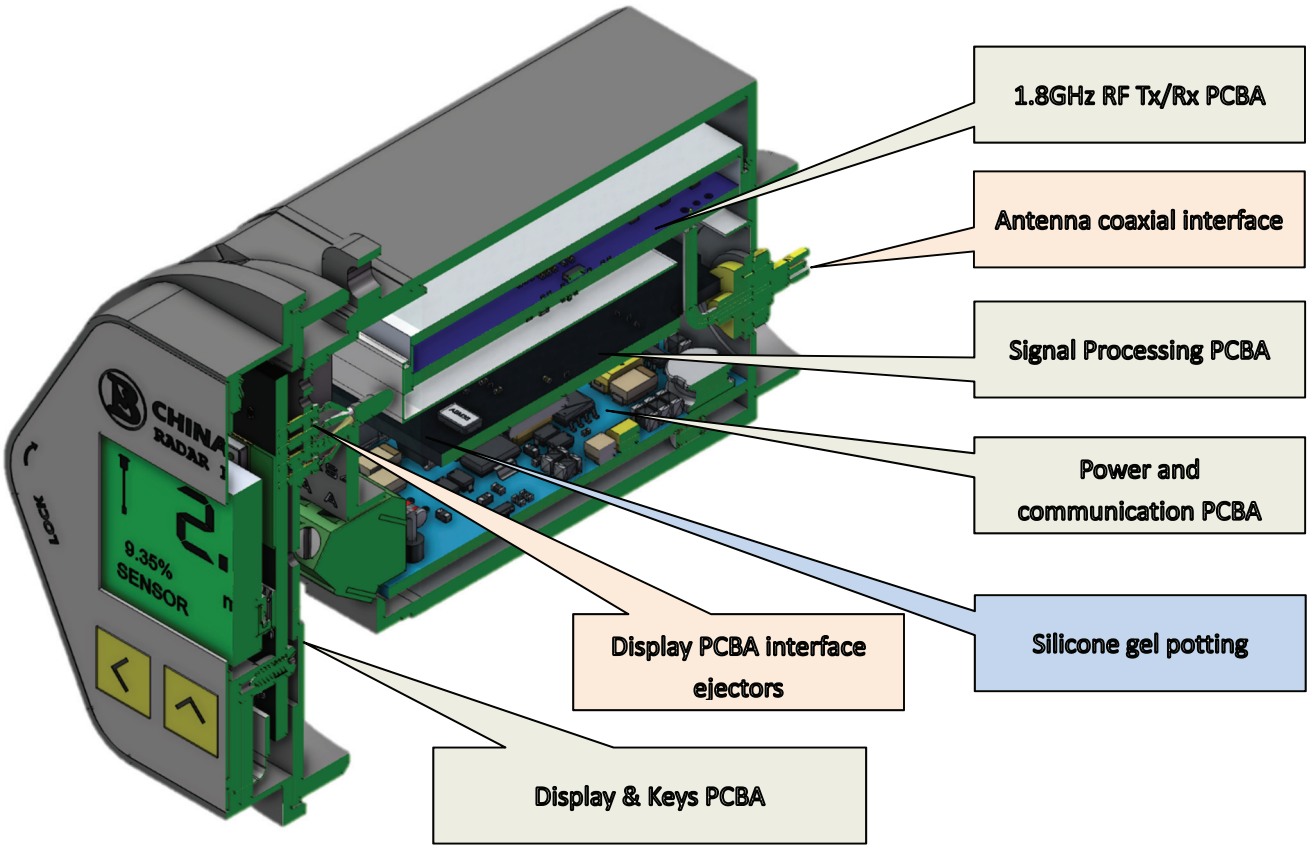
Features

- Level and interface measurement with minimum separation ≥80mm
- Level tracking and probe build-up monitoring
- Diagnostic indication meets requirements of NAMUR NE107
- Saturated steam compensation function
- Loop Resistance : 570 ohms @24 VDC
- Power switch-on phase current <3.6mA
- Programming via mobile APP (iPhone/Android/Harmony OS)
- LCD display/Bluetooth，Tank-Side LRD/RDM meter
- Digital Communication : HART 7.0 / MODBUS / PROFIBUS PA
- Low Temp Module (Orange color) Temp. range: -60℃ ~ 105℃

Application

- Time-of-flight technology produces reliable level readings even under changing process conditions.
- Application to contact, low power, fast response level continuous measurement.
- Suitable for very low dielectric (< 1.4), high temperature/high pressure water (steam) applications.

Electronic Module Structure



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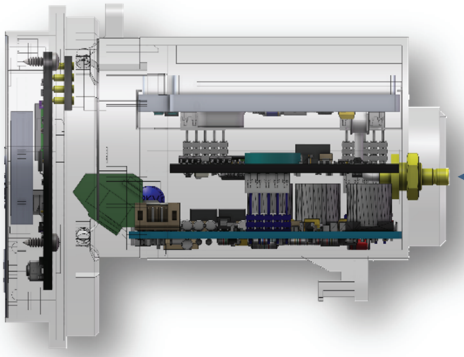
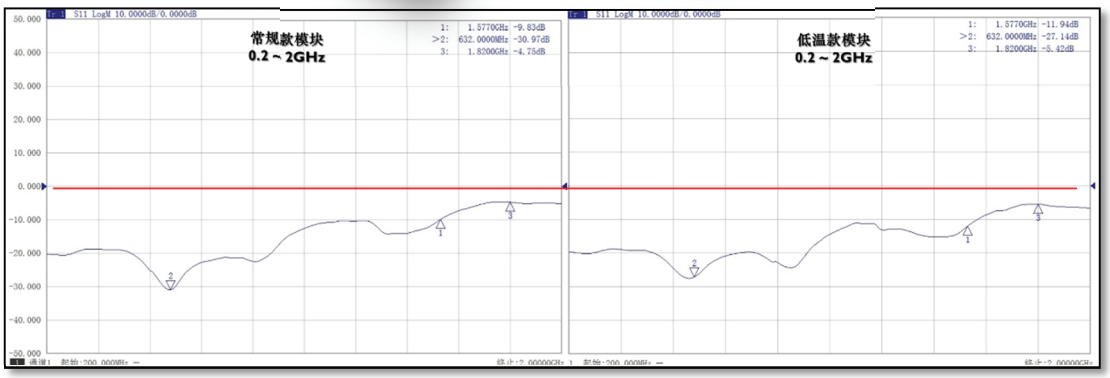
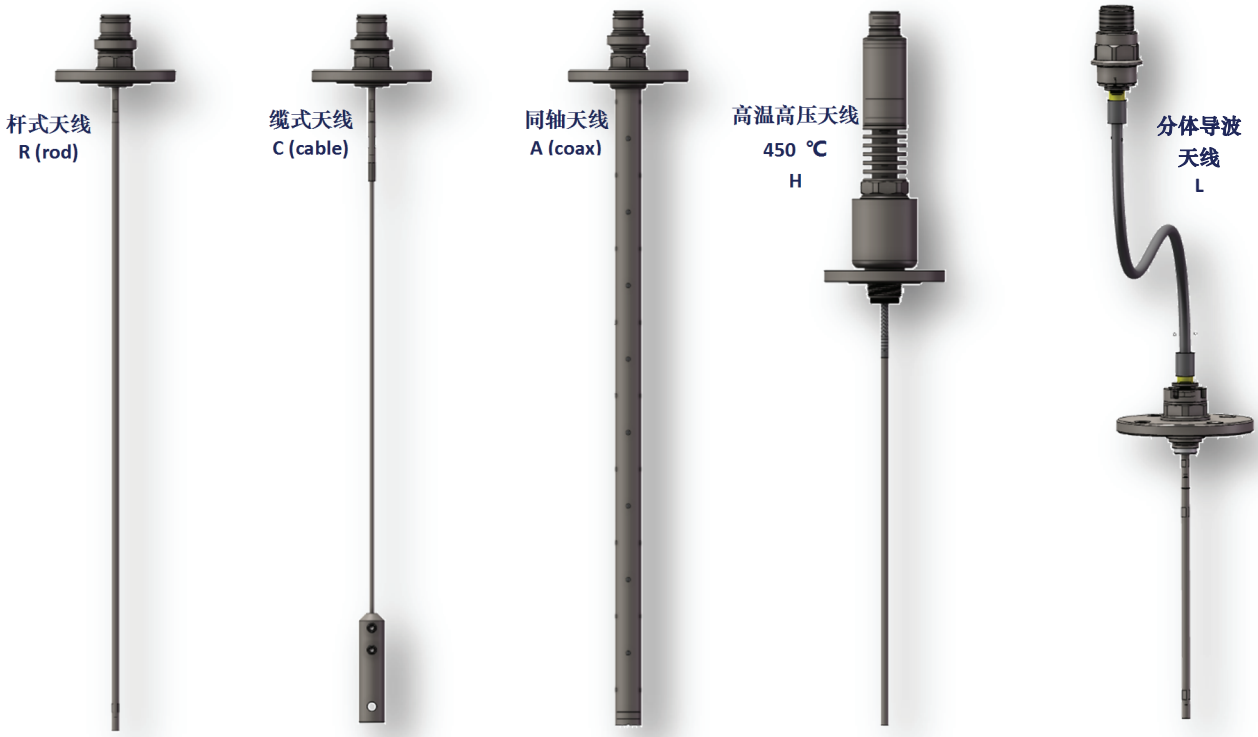
GWR Module RF interface S_{11} parameters





Type of Probe Antenna that can be mated



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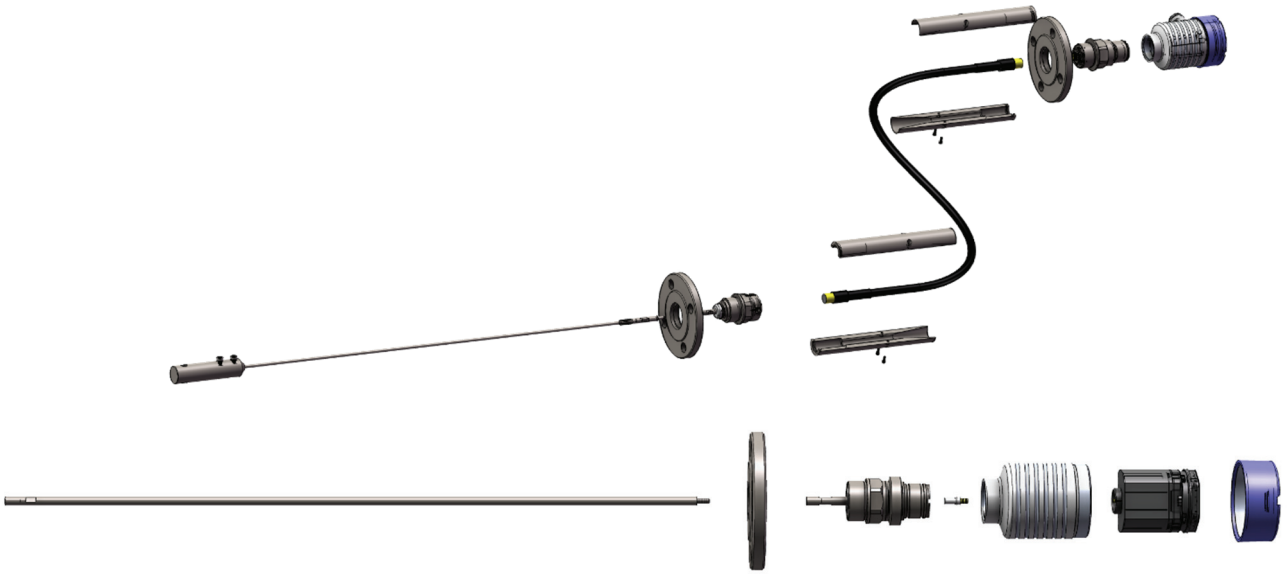
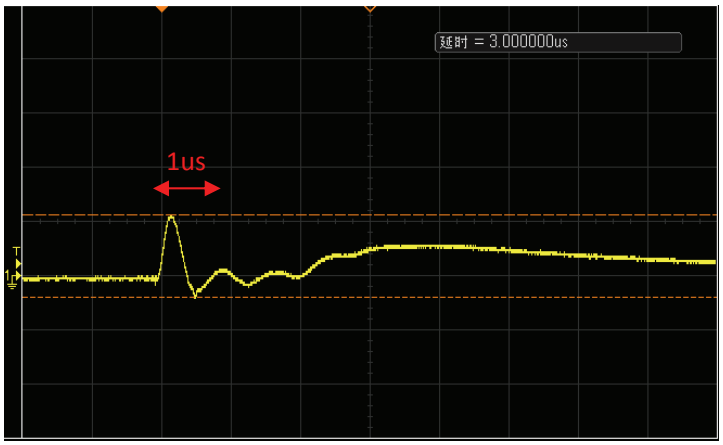
Probe Type	Minimum flange size available	Max. probe length (product for detailed)	Nozzle height @ Min. Diameter	Inherently adaptable process temperature range	Application Scenarios
R 杆式	≥DN50 or G1-1/2	6M	≤100mm @50mm	-60 ~ +100℃	Corrosive liquid, ordinary storage tank, metering tank, chemical water, pool, sink, hydrology and other liquid levels
C 缆式	≥DN50 or G1-1/2	70M	≤100mm @50mm	-60 ~ +100℃	Corrosive liquid, ordinary storage tank, metering tank, chemical water, pool, sink, hydrology and other liquid levels
A 同轴	≥DN80	6M	≤150mm @80mm	-60 ~ +100℃	Liquid storage tanks, high precision and high stability measurement applications

Illustration of the entire product assembly



Power supply start-up current waveform



模块启动电特性	可工作电压范围	启动瞬间峰值最大电流 MAX	启动电流稳定时间 @ ≤3.6mA
D-8010	11.0V ~ 38.0V	< 3us, 800mA @40V < 3us, 450mA @24V < 3us, 230mA @16V	≤ 35uS

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GWR Module electrical characteristic specifications

	1.8GHz Guided wave electronic module products			
Product images 8010D				
	Note : D0 integrated guided wave, D1 split guided wave, D2 level/boundary guided wave module; N60 cryogenic module			
	1.0 ~ 1.8GHz 2 Wired	1.0 ~ 1.8GHz 2 Wired PA	1.0 ~ 1.8GHz 2 Wired	1.8GHz 4 Wired
Technical data Version: 23Y0506	D0/D1/D2	D0/D1/D2	N60 D0/D1/D2	D0/D1/D2
1. Materials and weights				
Materials, wetted parts				
Antenna, process fitting	2GHz RF coaxial interface (bandwidth 500MHz ~ 5GHz)			
Process seals				
For the process conditions, please also note the specifications on the nameplate. The lowest value (am				
Flange nozzle length				
Process installation				
Process temperature				
Process pressure				
Materials, non-wetted parts				
Housing	尼龙 PA6(Polyamide), 玻纤强化(Fiberglass)			
Housing seals	壳体使用温度：-65 ~ 120 ℃			
Cable gland	Board insulating silicone gel (Dielectric Silicone Gel) potting			
Sealing, cable gland	Gel potting density/viscosity: 0.97g/cm3/800cPs			
Blind plug, cable gland				
Inspection window for the indication	Display module ejector: Material C3604 brass / Stretch: 80gF / Life >50000 times, Maximum current >1A, Contact resistance<0.03R			
Weight				
Product weight	< 0.3 kg (with gel filling weight)			
Contains package weight				
2. Torques				
Max. torque mounting boss				
Max. torque for NPT cable glands and Conduit tubes				
3. Input variable				
Measured variable	The measured value is the distance between the flange side of the sensor and the surface of the medium. The flange face is also the reference plane for measurement.			
Max.measuring range (Depending on application and medium)	≤ 6 ~ 70M (level, interface)			
Minimum measuring distance	Depending on the operating conditions and prob type			
mode 1, 2, 4				
mode 3				
4. Switch-on phase				
Run-up time for UB = 12 V DC, 18 V DC, 24 V DC	< 25 s			< 6 s
Starting current for run-up time	≤ 3.6 mA			≤ 15mA
Power consumption	The peak current duration at power-on instantaneous ≤ 5uS, and the current stabilization time is ≤50uS			
@ ≤ 3.6 mA	<45mW@12VDC; <65mW@18VDC; <90mW@24VDC (2 Wired)			
@ 4mA	<50mW@12VDC; <75mW@18VDC; <100mW@24VDC (2 Wired)			
@ 20mA	<245mW@12VDC; <370mW@18VDC; <485mW@24VDC (2 Wired)			
5. Output variable				
Output signal	4 ... 20 mA/HART			4 ... 20 mA/HART
Range of the output signal	3.8 ... 20.5 mA/HART (factory setup)			
Signal resolution	0.3 µA			
Resolution, digital	0.3 mm			
Fault signal, current output (adjustable)	≤ 3.6 mA, ≥ 21 mA , The latest applicable measurements			
Max. output current	23.5mA			
Starting current	≤ 3.6 mA ; ≤ 4 mA turn-on 10s			
load	当 24 V DC 时为 570 Ohm			
Damping (63 % of the input variable), adjustable	0 ... 999 s			
HART output values				
PV (Primary Value)	Linear percentage value			
SV (Secondary Value)	Distance / Level / Space			
TV (Third Value)	Measurement reliability			
QV (Fourth Value)	Electronic module temperature			
Fulfilled HART specification	HART V7.0 (可通过 PACTware/DTM 编程)			
Further information on Manufacturer ID, Device ID, Device Revision	参见 FieldComm Group 公司的网页			
Other optional output protocols (be arbitrarily selected)				
MODBUS (RS485)	Modbus RTU			
Profibus PA (Process Automation)	V3.02 过程自动化数据传送，可使传感器和执行机构联接于一根总线			
Profibus DP (Decentralized Periphery)	高速数据通信于设备级控制系统与分散式I/O前端传感器			
SDI-12	V1.3 应用在工农业多参数测控、江河湖海水文和气象等地球环境监测、养殖和食品行业，可远传送数据			
IO-link	IEC 61131-9			

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6. Deviation (according to DIN EN 60770-1)			
	Reference conditions according to DIN EN 61298-1		
	Temperature	+18 ... +30 °C (+64 ... +86 °F)	
	Relative humidity	45 ... 75 %	
	Air pressure	860 ... 1060 mbar/86 ... 106 kPa (12.5 ... 15.4 psig)	
	Installation reference conditions		
	Distance to installations	> 200 mm @ flange (Standard 10,000mm steel cable)	
	Reflector	Diameter > 300mm straight pipe flat level	
	False reflections	The maximum interference signal is 20 dB smaller than the effective signal	
	Deviation with liquids		
	Measuring distance > 0.25 m/0.8202 ft	≤ 3 mm	
	Measuring distance ≤ 0.25 m/0.8202 ft	≤ 8 mm	
	Non-repeatability (already included in the meas. deviation)	≤ 1.0 mm	
	Deviation with bulk solids	The values depend to a great extent on the application. Binding specifications are thus not possible.	
7. Variables influencing measurement accuracy			
	Specifications apply to the digital measured value		
	Temperature drift - Digital value	< 1 mm/10K, max. 3 mm	
	Specifications apply also to the current output		
	Temperature drift - Current output	< 0.03 %/10K or 0.3 % max, for the 16.7 mA range	
	Deviation in the current output due to digital/analogue conversion	< 15 µA	
	Additional deviation through electromagnetic interference		
	According to NAMUR NE 21	< 80 µA	
	According to EN 61326-1		
	According to IACS E10 /IEC 60945	< 250 µA	
8. Characteristics and performance data			
	Measuring frequency	1.8GHz 导波脉冲技术	
	Measuring cycle time @With operating voltage UB ≥ 24 VDC	≤ 300ms	≤ 150ms
	Step response time @Time span after a sudden distance change from 1 m to 5 m until the output signal reaches 90 % of the final value for the first time (IEC 61298-2). Valid with operating voltage UB ≥ 24 V DC.	≤ 4 s	≤ 2 s
	Beam angle @Outside the specified beam angle, the energy level of the radar signal is 50% (-3 dB) less.	Depends on the configuration probe type	
	Dielectric constant (liquid)	> 1.2	
9. Ambient conditions			
	Ambient temperature device	-40 ... 85 °C (常规模块) -60 ... 105 °C (低温模块) N60	
	Ambient temperature display	-65 ...120 °C	
	Storage and transport temperature	-55 ... 80 °C	
10. Mechanical environmental conditions			
	Vibrations (oscillations)	符合 IEC 60271-3-4 的 4M8 级 (5g, 当4 ... 200Hz时)	
	Impacts (mechanical shock)	符合 IEC 60271-3-6 的 6M4 级 (50 g, 2.3 ms)	
	Impact resistance	IK07 符合 IEC 62262	
11. Electromechanical data			
	Cable entry		
	• Options	M20 x 1.5; ½ NPT	
	• Cable gland	M20 x 1.5 (电缆直径 5 ... 9 mm)	
	• Closing cap	½ NPT	
	Wire cross-section (spring-loaded terminals)		
	• Stranded wire	0.2 mm² (AWG 24) ... 2.5 mm² (AWG 14)，最小绝缘层厚 0.5 mm 或更大	
12. Bluetooth interface			
	Bluetooth standard	V5.0 /or V4.2	
	Frequency	2.402 ... 2.480 GHz	
	Max. emitted power	+2.2 dBm	
	Max. number of participants	1	
	Effective range typ.(Depending on the local conditions)	25 m (82 ft)	
13. Indication			
	Measured value and menu display		
	• Optional HMI	160x80 dot matrix LCD display with background illumination with bar chart showing level scale values	
	• Max. indicating range	-99999 ... 99999	
14. Adjustment			
	Optional HMI	4 buttons for operating menus	
	Tank side meter	LRD type tank side meter (serial digital communication), RDM type tank side meter (HART protocol communication)	
	Field DTM communicator	AiW-305 (Master Mode), AiW-315 (Slave Mode)	
	PC/Notebook	CHINASIMBA® PC Manager software	
	Mobile terminal equipment	CHINASIMBA® Radar Mobile Manager software	
15. Voltage supply			
	Operating voltage U_B		
	• at 4 mA	11 ... 40 V DC	9 ... 40 V DC
	• at 20 mA	9 ... 40 V DC	9 ... 40 V DC
	Operating voltage UB - illuminated display and adjustment unit	16 ... 40 V DC	9 ... 40 V DC
	Reverse voltage protection	Built in	
16. Overvoltage protection			
	Dielectric strength against metallic mounting parts	>10KV	
	Overvoltage resistance (test impulse voltages 1.2/50 µs at 42 Ω)	> 1KV	
	Insulation resistance	∞	
	Dielectric strength	≤ 5mA @500VDC	
	Power frequency magnetic field immunity	100A/m @X,Y	
	Electrostatic discharge immunity	> 4KV	
	Radiated immunity to radio frequency electromagnetic fields	10V/m @80MHz ~ 1000MHz	
	Electrical fast transient burst immunity	> 2KV	
	Additional overvoltage arrester	Due to the floating structure of the electronics and comprehensive insulation measures generally not necessary	
17. Electrical protective measures			
	Protection rating	IP66/IP67 符合 IEC 605294X 型，符合 UL 50	
	Altitude above sea level	5000 m (16404 ft)	
	Protection class	III	
	Pollution degree	4	

NOTE:

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