Groundwater Monitoring Selection Guide

Introducing the OTT Groundwater Sensors and Dataloggers:

Common attributes across all OTT groundwater pressure sensors and loggers include:

- Ceramic pressure measurement cell – robust and reliable, with 5 x burst pressure
- Compensated for barometric pressure, temperature, and water density
- High grade 904 L Stainless Steel – designed for use in harsh environments, like saltwater
- Simple maintenance – easily replace SIM card, and desiccant on-site without tools

All-in-one systems

OTT ecoLog 500/800

- For remote transmission of depth to water, water level, and temperature
- Conductivity measurement available with ecoLog 800
- Integrated programmable datalogger, stores up to 500.000 measurements
- Configurable alarm management for threshold monitoring
- Support data transmission via GSM/GPRS cellular using FTP, HTTP, SMS or e-mail (SMTP)

Groundwater Loggers

OTT CTD and Orpheus Mini

- For monitoring depth to water, water level, and temperature
- Available with high accuracy temperature or conductivity measurement
- Integrated programmable datalogger, stores up to 500.000 measured values
- Remote data transmission option available when paired with the OTT ITC

Pressure Level Sensor

OTT PLS

- For monitoring water level, depth to water, pressure, and temperature
- Simple integration into almost any datalogger or data collection platform
- Uses standard communication protocols like SDI-12

Shaft Encoders

OTT Thalimedes and SE200

- Continuous Measurement of water level using float-operated shaft encoder
- Available with an integrated datalogger or sensor-only for use with external dataloggers
- Integrated LCD display (Thalimedes only)
- Remote data transmission option available using the OTT ITC

Contact Gauges

OTT KL 010

- For manual measurement of depth to water
- Can be used for measuring water temperature (KL 010 TM) or conductivity (KL 010 TCM)
- Measuring Ranges: 15…750m, -1°…+70°C, 0…200mS/cm

Sensor Selection Table Part 1

		OTT PLS	OTT Orpheus Mini	OTT CTD	OTT ecoLog 500	OTT ecoLog 800	OTT Thalimedes	OTT SE 200
Parameters	Water Level/Depth	x	x	x	x	x	x	x
	Conductivity			x		x		
	Temperature	x (not with 4..20mA)	x	x	X	x		
Logging	Integrated datalogger		x	x	x	x	x	
Remote Communication	Cellular (GSM/GPRS)		In conjunction with OTT ITC	In conjunction with OTT ITC	x	x	In conjunction with OTT ITC (Only GSM)	
Output	SDI-12	x					x	x
	RS485 using SDI-12	x						
	4…20mA	x						x
	Local Wireless Communication (IrDA)		x	x	x	x	x	
	GSM/GPRS (FTP, HTTP, SMTP, SMS)		In conjunction with OTT ITC	In conjunction with OTT ITC	x	x		
Applications	Salt-water intrusion detection			x		x		
	Water pollution detection			x		x		
	Track movement of tracers and saltwater			x		x		
	Hydraulic fracturing monitoring	x	x	x	x	x	x	x
	Estimate groundwater recharge rates	x	x	x	x	x	x	x
	Aquifer storage and recovery	x	x	x	x	x	x	x
	Brackish water	x	x	x	x	x	x	x
	Corrosive conditions	x	x	x	x	x	x	x

Sensor Selection Table Part 2

		OTT PLS	OTT Orpheus Mini	OTT CTD	OTT ecoLog 500	OTT ecoLog 800	OTT Thalimedes	OTT SE 200
Type of Measurement		Gauge Pressure Temperature	Gauge Pressure Temperature	Gauge Pressure Temperature Conductivity	Gauge Pressure Temperature	Gauge Pressure Temperature Conductivity	Float-cable-counterweight system	Float-cable-counterweight system
Sensor Type		Ceramic pressure cell	Ceramic pressure cell	Ceramic pressure cell & 4-graphite electrode conductivity cell	Ceramic pressure cell	Ceramic pressure cell & 4-graphite electrode conductivity cell	Shaft Encoder	Shaft Encoder
Measuring Range	Level	0-4 m (0-13 ft) 0-10 m (0-33 ft) 0-20 m (0-66 ft) 0-40 m (0-130 ft) 0-100 m (0-328 ft)	0-4 m (0-13 ft) 0-10 m (0-33 ft) 0-20 m (0-66 ft) 0-40 m (0-130 ft) 0-100 m (0-328 ft)	0-4 m (0-13 ft) 0-10 m (0-33 ft) 0-20 m (0-66 ft) 0-40 m (0-130 ft) 0-100 m (0-328 ft)	0-4 m (0-13 ft) 0-10 m (0-33 ft) 0-20 m (0-66 ft) 0-40 m (0-130 ft) 0-100 m (0-328 ft)	0-4 m (0-13 ft) 0-10 m (0-33 ft) 0-20 m (0-66 ft) 0-40 m (0-130 ft) 0-100 m (0-328 ft)	±199.99 m ±19.999 m ±199.99 ft	±30 m
	Temperature	-25° to 70°C (-13° to 158°F)	-25° to 70°C (-13° to 158°F)	-25° to 70°C (-13° to 158°F)	-25° to 70°C (-13° to 158°F)	-25° to 70°C (-13° to 158°F)		
	Conductivity			0 to 2000 µS/cm 0.1 to 100 mS/cm		0 to 2000 µS/cm 0.1 to 100 mS/cm		
Accuracy	Level	± 0.05% FS (SDI-12) ± 0.1% FS (4…20mA)	± 0.05% FS	± 0.05% FS	± 0.05% FS	± 0.05% FS	±0.0066 ft ±1 Digit ±0.002 m ±1 Digit	±0.003% of measurement range (SDI-12) ±0.1% of measurement range (4-20 mA)
	Temperature	± 0.5°C	±0.5°C (±0.1°C optional)	± 0.1°C	± 0.5°C (±0.1°C optional)	± 0.5°C		
	Conductivity			0 to 2000 µS/cm: ± 1 µS/cm 0.1 to 100 mS/cm: ± 0.01mS/cm		0 to 2000 µS/cm: ± 1 µS/cm 0.1 to 100 mS/cm: ± 0.01mS/cm		
Power Consumption / Estimated Battery Life	1 hr. sample interval with Lithium:	SDI-12 - Active: < 3.6 mA Sleep: < 600 µA	min. 5 yrs. (ITC option: > 2 yrs. at 1 SMS per day)	min. 5 yrs. (ITC option: > 2 yrs. at 1 SMS per day)	Approx. 10 year (one transmission per week)	Approx. 10 year (one transmission per week)		SDI-12 - Active: < 2.0 mA Sleep: < 400 µA
	1 hr. sample interval with Alkaline:		min. 1.5 yrs.	min. 1.5 yrs.	Approx. 2 years (one transmission per week)	Approx. 1 years (one transmission per week)	Approx. 15 months	
Installation	Well Diameter	≥1”	≥1” 2”-4” (ITC option)	≥1” 2”-4” (ITC option)	≥2”	≥2”	≥4”	≥4”
	Placement	Probe in-well	Probe and Logger in-well (optional ITC in top cap)	Probe and Logger in-well (optional ITC in top cap)	Probe, Logger and Transmitter in-well (external antenna option)	Probe, Logger and Transmitter in-well (external antenna option)	Float, pulley and logger in-well	Float and pulley in-well

Determine what technology is best for your project?

Well:

Diameter: _____

Measuring point reference: _____

Maximum well depth: _____

Description of existing top cap or borehole lid:

_____

Depth-to-Water:

Minimum: _____

Maximum: _____

This information identifies the water level fluctuation and assists with selecting the ideal water level measurement range

Measurement parameters:

What data are you interest in measuring and collecting?

- Water level / Depth to water: ☐
- Water temperature: ☐
- Conductivity: ☐
- Salinity: ☐
- Total Dissolved Solids (TDS): ☐

Other information of interest?

- Power Supply: ☐
- GSM Signal strength: ☐

Data Collection:

Is remote communication of measured data required?

What are the benefits of remote communicate:

- Reduce the frequency of site visits by transmitting measured data direct to the office or a web server
- Transmit alarm messages to notify users of low battery voltage, quality assurance status messages, and user definable thresholds

In what Interval do you want to take measurements? _____

How often do you want to transmit the data? _____

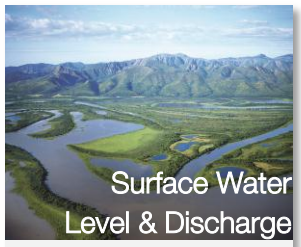
OTT Solutions

- Groundwater dataloggers
- Remote groundwater monitoring
- Groundwater level sensors

- Surface water sensors
- Groundwater sensors
- Multiparameter Sondes for surface and groundwater

- Software for communication and data management
- Web application for data management
- Tel-, Sat, GSM-, GPRS- and IP-Com

- All weather precipitation gauges
- Present weather sensors



- Pressure, radar, and bubbler level sensors
- Discharge
  - Spot measurement
  - Continuous measurement

Established technology in Groundwater Monitoring

OTT Hydromet has been developing and manufacturing groundwater loggers, sensors, and remote communication units for over 20 years. Known for their reliability and longevity, OTT groundwater products have been field proven in thousands of installations worldwide.

OTT groundwater loggers accurately measure parameters such as water level or depth to water, temperature, and conductivity. Collected data is stored to the internal datalogger and can be transmitted automatically from the well site back to the office, using GSM or GPRS cellular technology.

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