



HydroMetrics – Nitrate GW50 Groundwater Optical Nitrate Sensor

Introduction 引言

Many countries around the world are in the process of adopting nitrate caps via nitrogen discharge allowances to manage nitrate losses into freshwater bodies and groundwater drinking supplies from agricultural production.

One area that remains unclear is how nitrate losses will be reliably measured to monitor and enforce these limits. Current approaches are principally based on modelling, rather than direct measurement of nitrate losses, as options such as regular physical sampling or real-time sensors are too expensive to be scalable. To address this, Lincoln Agritech has developed a low-cost sensor capable of measuring the concentration of nitrates in groundwater via monitoring wells.

农业生产活动产生的硝态氮淋失对淡水和地下水资源构成污染，许多国家都在通过制定硝态氮排放配额对氮淋失进行控制。然而，究竟哪种方法能对硝态氮进行稳定的监测以对配额进行监控和管理却不得而知。现有的测量方法大都以模型为基础，而不是对硝态氮进行直接检测，采用定期取样进行物理分析或实时传感测量的方式成本高昂。为解决这一难题，林肯农业科技有限公司开发的低成本测量仪只需借助地下水监测井便可测量地下水中的硝态氮浓度。



General Specifications 通用规格

- Groundwater deployment to measure nitrate nitrogen concentrations.
测量地下水中的硝态氮浓度。
- Deployment in low ionic strength groundwater means organic carbon or chloride interferences are minimal.
在碘离子浓度低的地下水层进行测量，将有机碳和氯化物所产生的影响最小化。
- Designed to allow installation in 50 mm wells. These are often able to be installed by low cost direct push technologies, reducing the overall installation cost.
适用于直径 50 mm 的地下水位监测井，可通过直接推进技术进行安装，降低了安装成本。
- Remote data-logging capability for real-time data.
遥控数据记录系统实时采集数据。
- A fit for purpose Nitrate Sensor at a low price point that enables feasible deployment across multiple sites at the catchment or farm scale.
为集水区或农场提供了低成本、多点监测的解决方案。
- Low power consumption (solar power installation possible).
降低能耗 (支持太阳能供电)。
- The sensor utilises optical sensor technology to extend the service interval when compared to other lower cost technologies such as Ion Selective Electrodes, which often suffer from significant calibration drift. This makes Lincoln Agritech's optical sensor more suitable for long term unattended deployment.

使用离子选择性电极分析法等一些低成本技术通常会产生较大的校准偏差，而光学传感测量仪适合在无人看管的条件下完成长时间的测量工作。

- Periodic cleaning rather than calibration required, reducing ongoing maintenance.
只需对设备进行定期清理，无需校准，降低了后期维护成本。
- Continuous monitoring as opposed to laboratory analysis is rapidly growing within the agricultural community due to increased data frequency.
随着数据采集频率的增加，实验室的数据分析已不能满足需求，农业生产过程中对硝态氮的持续监测不断增加。



Speed of Access Important 数据访问速度的重要性

Connectivity is key to data access 连接是关键

- Modern communication systems allow data to be accessed in real time with no delays.
现代化的通信系统可对数据进行实时访问无延迟。
- Makes reporting easy.
形成简易的报告系统。
- The Hydrometric Sensors can be connected to a wide range of communication devices to make accessing the data very simple and then it is easy to make available to people who require it via servers or internet websites.
水文传感测量仪可连接多种通讯设备，简化了数据访问流程，使数据在服务器和网站上即可被获得。
- Manual downloading or laboratory processing is expensive and time consuming.
手动下载数据或实验室数据处理成本高昂且耗时。

Local

从本地下载



or 或

Telemetry

访问遥测数据



Technical Specification 技术规格

Measurement technology (light source) 测量技术(光源)	Xenon flash 氙气闪光灯
Measurement principle 测量原理	UV Absorbance 紫外吸收光谱法
Measurement cell 测量单元	8 mm 直径 8mm 测量管
Parameter 参数	NO ₃ -N 硝态氮
Measurement range 测量范围	0 – 50 mg/L (without measurement cell alteration) 0 – 50 毫克/升 (无需缩小测量管直径)
Measurement accuracy 测量精度	+/- 5% +0.1 mg N/L (against standards) +/- 5% +0.1 毫克 当量/升 (相对于标准值)
Turbidity compensation 透射光补偿	Yes 包含
Data logger 数据记录容量	~ 16 GB internal storage ~ 16 GB 内部存储
Measurement interval 测量间隔	≥ 1 min ≥ 1 分钟
Housing material 外部材料	316 stainless steel 316 不锈钢
Dimensions (ø x L) 尺寸(ø x L)	42.2 mm x 455 mm 42.2 毫米 x 455 毫米
Weight 重量	3.44 kg (including 10 m of cable) 3.44 公斤 包括10 m的电缆
Interface 接口	SDI-12 / RS-232
Power consumption 能耗	< 100 mW < 100 毫瓦
Power supply 电源电压	11.5 - 15.5 V 11.5 - 15.5 伏
Guarantee 质保期	1 year 1 年

Specifications are subject to change without notification. 技术规格或有变动，不会预先通知。

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