

GROUNDWATER / BORE HOLE MONITORING



APPLICATION BACKGROUND

Groundwater depth measurements (often called bore hole monitoring) help in the management of the important groundwater resource on which we depend for many purposes. In particular groundwater resources may be used up through agriculture or mining operations.

Instruments can easily measure the amount of water that resides in our groundwater so we can manage the resource better.

Measurements can deepen our understanding of the factors that influence groundwater recharge and lead to more effective water management.

APPLICATION DETAIL

Groundwater depth is measured with a small diameter sensor deep in an observation bore hole. Water depth can be measured with a pressure sensor lowered down the bore hole and immersed in the water. This is called hydrostatic depth method.

Alternatively a standard float-and-pulley sensor system with a small (50mm or 100mm) float and a pulley at the top of the bore hole can also be used to measure depth.

The hydrostatic depth method is widely used as it is convenient to install, however all pressure sensors have some drift which needs to be considered. The float and pulley method is less convenient, especially in narrow diameter bore holes of 100mm, however it is very accurate and is not subject to drift.

Unidata offers the 6542 Hydrostatic Water Depth and Temperature Probe which uses the hydrostatic pressure of water to measure water depths in various environments.

These systems are typically installed in existing bores, perhaps with a diameter of 100 to 200mm and a depth of 5 to 50 meters, with a bore head cap, often in a valve box / enclosure or some other form of bore head arrangement.

A data logger / RTU / NRL needs to be added at the top of the bore for data to be recorded and telemetered to a central location on a regular, perhaps 4 hourly basis.

There are generally two types of customers for these systems:

- A government authority which measures the groundwater levels for water table history generally.
- A mining or oil and gas company which has some mining or drilling activity in the area and has a need to ensure there is no change to the groundwater during their mining or drilling processes for compliance reasons.

The data collected can then be viewed, limits checked and alarms set in the event of a sudden change in the ground water level.

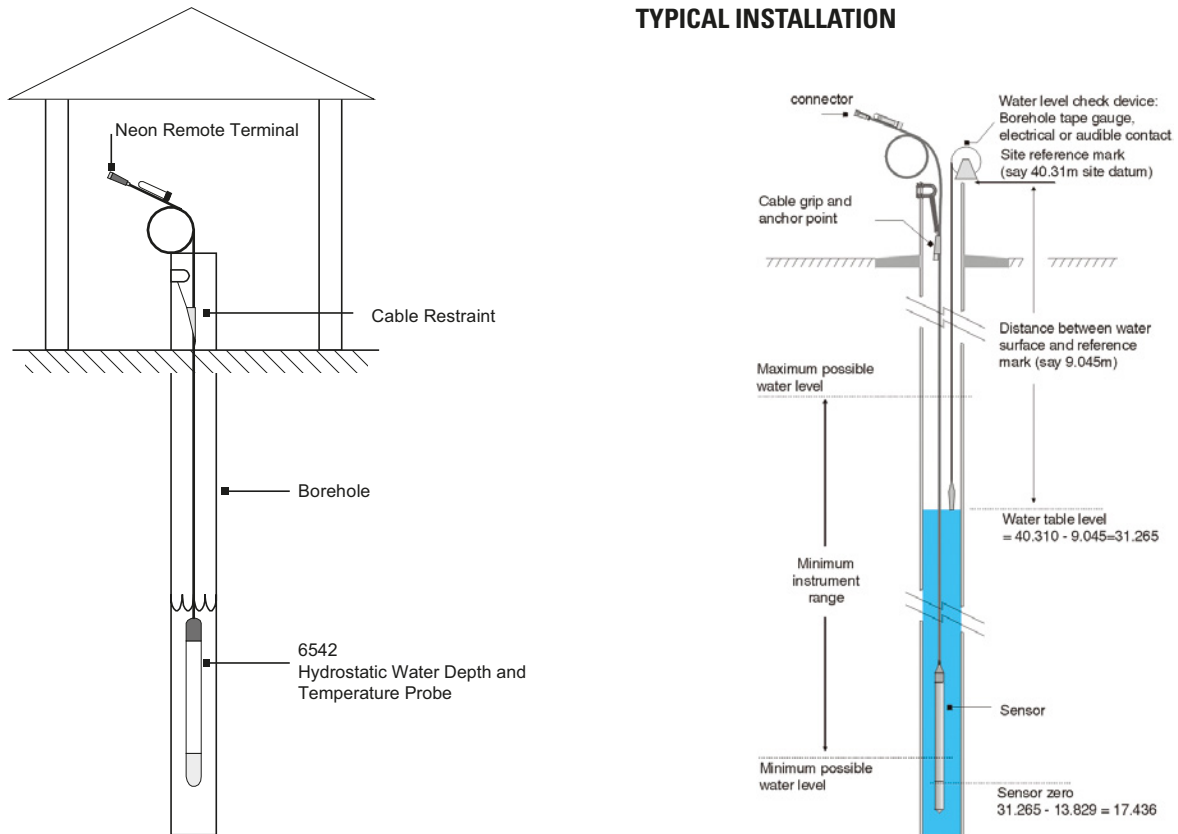
The data can then be passed to a statistical groundwater analysis software package for groundwater modeling purposes.

Unidata offers the 3001M Borehole Logger that is designed for use in boreholes of 100mm internal diameter and above. It can be configured to use either Cellular, LoRa, Iridium or Microsatellite networks as its method of sending sensor data from the field to the Neon Server. A wide range of sensor types are supported, for example, analog sensors, frequency counters, digital inputs as well as Modbus and SDI-12.

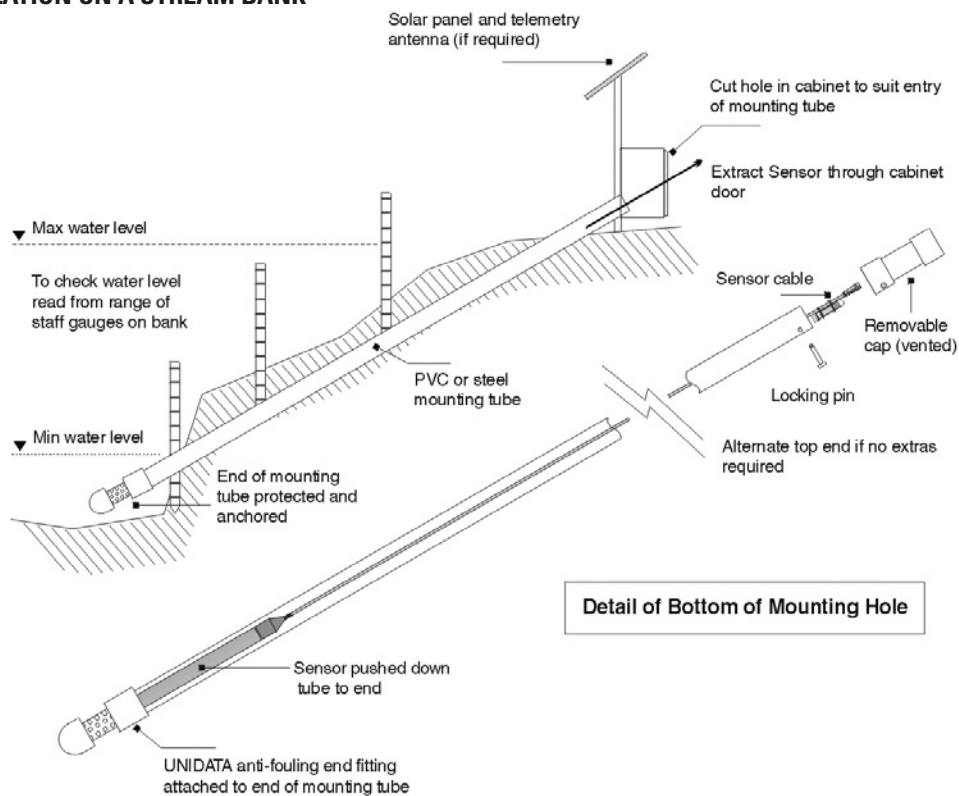
Sensors are connected to the logger via pluggable terminal blocks, SQL connector or a custom specified connector, allowing for easy removal of the logger if servicing is required.



TYPICAL INSTALLATION



TYPICAL INSTALLATION ON A STREAM BANK



TYPICAL CONFIGURATION

APPLICATION SPECIFIC INSTRUMENTS / INPUTS

Options	Unidata Part Number	Description
Borehole Neon Remote Logger	3001B-MC / L / I / H	Cellular, LoRa, Iridium or Microsatellite
Hydrostatic Water Depth Probes	6542D-A / B / C	PT12 Pressure / Temperature Sensor SDI-12 3.5m, 10m or 20m
Hydrostatic Water Depth Probes Titanium	6542D-T-A / B / C	PT12 Pressure / Temperature Sensor SDI-12 3.5m, 10m or 20m
4-20mA Pressure Transmitter	6548A-B / C	Submersible Pressure Transmitter 4-20mA 5m or 10m

NEON TELEMETRY - NRL / RTU / FIELD UNITS

Options	Unidata Part Number	Description
Ethernet	3016A-000 / 3008A-000	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Ethernet & 3G / 4G	3016A-C00 / 3008A-C00	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Ethernet & 3G / 4G and LoRa	3016A-CL0 / 3008A-CL0	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Equatorial Orbit Satellite - Inmarsat	3016A-00I / 3008A-00I	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Equatorial Orbit Satellite - Inmarsat & 3G/4G	3016A-C0I / 3008A-C0I	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Low Earth Orbit Satellite - Globalstar	3016A-00G / 3008A-00G	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Satellite - Iridium Short Burst Data	3016A-00R / 3008A-00R	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Standalone RTU/NRL - Industrial	3004A-00 / 3004A-0L	Neon Remote Logger-4 Analog Ch with or without Touch Screen Display
Cellular RTU/NRL 3G/4G - Industrial	3004AC0 / 3004A-CL	Neon Remote Logger-4 Analog Ch with or without Touch Screen Display
M – Series Standalone RTU / NRL	3004B-M000 / 3004B-M0B0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series Cellular RTU / NRL 3G / 4G	3004B-MC00 / 3004B-MCB0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series LoRa RTU / NRL	3004B-ML00 / 3004B-MLB0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series Ethernet RTU / NRL	3004B-MEBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional
M – Series Microsatellite RTU / NRL	3004B-MHBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional
M – Series Iridium Short Burst Data RTU / NRL	3004B-MIBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional

NEON APPLICATION SOFTWARE - CUSTOMER SERVER

Options	Unidata Part Number	Description
Neon Applications Software	2302A	Neon Server Software Licence Incl 5 NAL
Neon Applications Software	2302A-10	Additional 10 NRT Access Licence
Neon Applications Software	2302A-20	Additional 20 NRT Access Licence
Neon Applications Software	2302A-50	Additional 50 NRT Access Licence

NEON HOSTING SERVICE - UNIDATA SERVER

Options	Unidata Part Number	Description
Neon Hosting Service	2301A	Neon Data Initial Subscription Setup Fee
Neon Hosting Service	2301A-01	Neon Data Service Fee for 1-50 NRT
Neon Hosting Service	2301A-02	Neon Data Service Fee for 51-100 NRT
Neon Hosting Service	2301A-10	Neon Data Service Fee Metering

DATALOGGER MANAGEMENT SOFTWARE

Options	Unidata Part Number	Description
Starlog V4 Management Software	6308A-AUE	STARLOG V4 Full Licence Key

AVAILABLE FROM: **Unidata Pty Ltd** | 40 Ladner Street, O'Connor, 6163 Western Australia | Tel: +61 8 9331 8600 | info@unidata.com.au