



Borewatch

Quick Start Guide



Models HBW-001, HBW-002

Date September 2026

The Borewatch is a self-contained bore monitoring logger. It records water level, water quality, and other sensor data. It sends that data over the mobile network, using 4G, or LTE Cat-M1 / NB-IoT, depending on the variant. This guide shows you how to install the unit and check that it sends data. It does not cover the settings that change from site to site. See the Borewatch User Manual for the full detail. You can download it from halytech.com.au/borewatch.

Suggested pre-site preparation

Do these steps in the workshop if you can. They are much easier there than in the field.

- Open case, install SIM, connect battery, close case
- Connect the LANlink cable or HLink dongle, then log in to the web interface
- Load a config from a similar site if you have one, or build a new one
- Configure inputs, outputs, alarms, and reports
- Test mobile signal and send a test SMS
- Save setup to disk

1. What's in the Box

Item	Qty
Borewatch unit	1
Battery pack (fitted inside unit, disconnected)	1
Halytech Comm Port sealing cap	1
Quick Start Guide	1

A new Borewatch ships without a SIM card and with the battery disconnected.

2. Before You Start

Get these things before you go to site:

- 2.5 mm hex driver (needed to open the enclosure)
- External antenna. See the modem variant table below
- LANlink cable or HLink dongle (required for initial configuration only)
- SIM card with mobile data and SMS enabled (disable the SIM PIN before inserting)
- M12 sensor cable. No cable ships with the unit. Buy the Borewatch M12 input cable from Halytech, or buy an 8-pin M12 connector or cable from another supplier

Antenna by modem variant:

Variant	Antennas required
4G	2 × SMA
Cat-M1	1 × SMA

APN: You need the APN for your SIM card during configuration. Ask your carrier or SIM provider for the correct value before you go to site.

iPhone SIM warning: Do not install a SIM that still has iMessage active. Apple keeps the SMS commands. The unit never receives them.

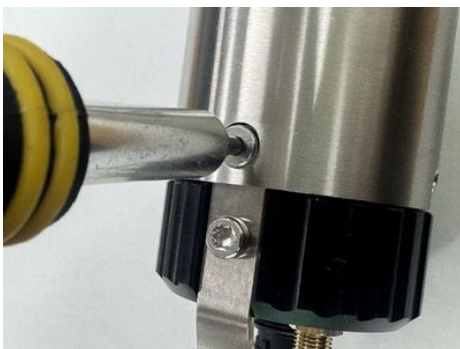
If the SIM was used in an iPhone, do one of these first:

- You still have the iPhone: turn off iMessage at **Settings** → **Messages** → **iMessage**.
- You no longer have the iPhone: remove the number at **selfsolve.apple.com**.

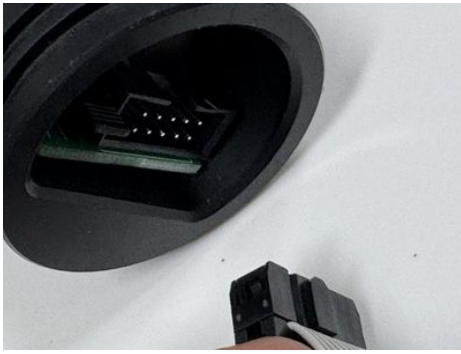
3. Open the Unit and Insert the SIM Card

The Borewatch needs a SIM card to send automatic reports and alarms over the mobile network. The SIM card sits on the PCB inside the tube. To reach it, you must open both end caps and slide the electronics assembly out.

1. Remove the hex locking screw from the sensor (bottom) end cap.
2. Twist the end cap to release the bayonet lock and remove it.



3. Unplug the ribbon cable from the end cap.



4. Slide the battery part way out of the tube to expose the battery connector. If it does not slide out, tap the unit gently.
5. Unplug the battery inline connector. Remove the battery.



6. Open the top end the same way. Remove the hex locking screw. Twist the cap to release the bayonet lock. Remove the cap.
7. Slide the electronics assembly out slowly to expose the SIM card. Guide the ribbon cable as you go so it does not snag.



8. Install the Nano SIM card in the holder on the PCB. The holder is small, so work carefully.
 - Slide the metal cover a few millimetres until it clicks. Then hinge it open.
 - Place the SIM in the plastic tray. Match the notched corner of the SIM to the notch in the tray.
 - Hinge the metal cover back over the SIM. Slide it to lock.



9. Slide the electronics assembly back in. Refit the hex locking screw.

10. Go to Section 4 to reconnect the battery and close the unit.

4. Connect the Battery and Close

1. Position the battery connector and plug it into the inline connector.



2. Slide the battery back into the tube.



3. Reconnect the ribbon cable to the end cap.

4. Refit the end cap using the bayonet mechanism.



5. Refit and tighten the hex locking screw.



5. Connect the Antenna

1. Connect the SMA antennas to the connectors on the top end cap.

- 4G variant: 2 SMA connectors
- Cat-M1 variant: 1 SMA connector



2. Tighten by hand only. Do not use tools on SMA connectors.

3. Seal each connection with self-vulcanising rubber tape.

6. Connect to the Web Interface

You configure the Borewatch through a web browser. The Borewatch has a built-in web server. You do not need to install any software.

Option A — LANlink Cable (Ethernet)

1. Connect the LANlink cable between the Halytech Comm Port and your computer.
2. Open a browser and go to: `http://192.168.0.177`

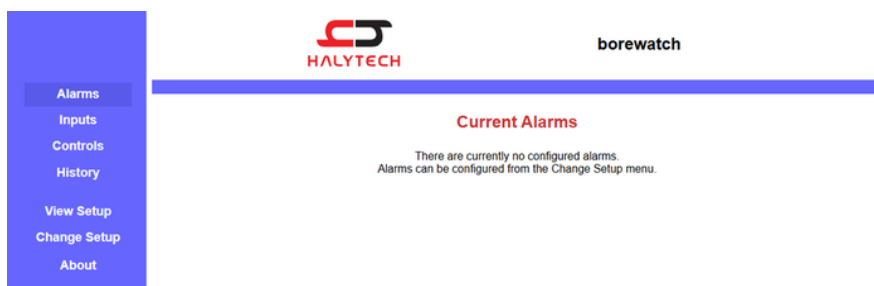
Option B — HLink Dongle (Wi-Fi)

1. Connect the HLink dongle to the Halytech Comm Port.
2. The HLink dongle creates a Wi-Fi network. Connect your device to it. The network name is `192.168.2.177_mS2_<serial>`. Replace `<serial>` with the serial number of your unit. The Wi-Fi password is `Halytech`.
3. Open a browser and go to: `http://192.168.2.177`

Default Credentials

Field	Value
Username	<code>user</code>
Password	<code>changeme</code>

Change the password on first login.



Use the menu on the left to reach every page in this guide. **Change Setup** holds all the configuration pages.

Note: The Borewatch takes power from three sources. It uses them in this order.

- **External power above 9V through the Halytech Comm Port.** The whole Borewatch runs from the external supply, including the modem. The internal battery is not used.
- **USB through the LANlink cable or HLink dongle.** This powers everything except the modem. You can run a long setup session without draining the internal battery.

- **Internal battery.** This is the normal source in the field.

7. Set the Clock

Set the clock before you configure anything else.

1. Navigate to **Change Setup** → **Time & Date**.
2. Click **Set from computer**. This copies the date, time and time zone from your computer.
3. Click **Save**.

HALYTECH borewatch

Home >> Change Setup >> Time / Date

Change Time and Date Settings

Time and Date

Current date 04/09/2026

Current time 10:50:33 (hh:mm:ss) - 24 Hour

Time zone +10:00 (Sydney is +10:00)

Set from computer

Time Synchronisation (NTP)

Automatic NTP ☒

NTP server time.google.com

Synchronise now

Note: daylight saving is not supported.

Cancel Save

The Borewatch stamps every logged reading with its own clock. A reading logged before you set the clock keeps the wrong time stamp, and you cannot correct it later. Wrong time stamps make the history useless when you need to diagnose a problem on site.

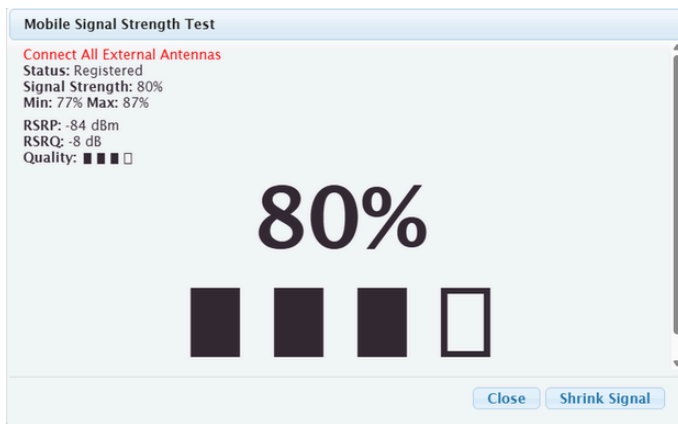
Daylight saving is not supported. Set the clock to non-daylight-saving time.

See also: *Clock and time synchronisation*

8. Test Mobile Connection

Connect the antenna before you start this test.

1. Connect your LANlink cable or HLink dongle to the Borewatch.
2. Log in to the web interface. See Section 6.
3. Navigate to **Change Setup** → **Modem Diagnostics**.
4. Click **Mobile Signal Test**.
5. Read the display. It shows two separate things. **Signal Strength** tells you how strong the signal is. **Quality** tells you how clean it is. Both must be good.
6. Click **Enlarge Signal**. The reading becomes large so you can read it from a distance while you move the antenna.



Signal strength reference:

Level	Rating	Action
Excellent	≥75%	No action
Good	≥50%	No action
Acceptable	≥40%	No action
Poor	<40%	Move the antenna

The **Quality** bar is a separate reading. It is not the signal strength. Three or four filled boxes is good. One or two boxes means you should move the antenna, even if the signal strength is high.

- Click **Close** to end the signal test. The SMS Test panel sits behind the test window. You must close the window to reach it.
- Enter your mobile number in the **Phone number** field.
- Click **Send Test SMS**. You should get an SMS. It shows the unit's location, serial number, signal strength, and date and time.

Strength and quality are different things. A signal can be strong and still be too noisy to use.

- Signal Strength** — shown as a percentage, and as RSRP in dBm. To show the percentage as dBm instead, go to **Change Setup** → **Network** and set **Signal strength format** to **Power (dBm)**.
- Quality** — shown as RSRQ in dB, and as a bar of four boxes. More filled boxes is better.

The modem may be off when you start a test. If it is off, it needs 30 to 60 seconds to start and find a signal. Wait at least 75 seconds before you decide a test has failed. This applies to the test SMS, the test email, and the test report.

9. Connect Sensors

The I/O connector is an 8-pin M12 socket at the bottom (sensor) end of the unit.

No M12 cable ships with the unit. Buy the Borewatch M12 input cable from Halytech, or buy an 8-pin M12 connector or cable from another supplier. See the Accessories table in Section 16.

Pin	Colour	Name	Function
1	White	Digital In	Switch / Counter input — active = short to Ground
2	Brown	PWR OUT	Switched 12V sensor power output, max 200 mA (Control 1)
3	Green	RS485 D–	RS-485 data –
4	Yellow	RS485 D+	RS-485 data +
5	Grey	OC / AIN	Open Collector output (Control 2) or Analogue input. An internal jumper selects which one
6	Pink	SDI-Data	SDI-12 data
7	Blue	GND	Ground
8	Red	LV OUT	Internal low voltage sensor supply — 3.3V or 5V (user selectable), ~20 mA

Input wiring notes:

- Switch, event, and counter inputs: connect between Digital In (pin 1) and Ground (pin 7)
- 4–20 mA sensors: connect directly between OC/AIN (pin 5) and Ground — no external resistors required. Set the channel type to **Analogue (4-20mA)**.
- Voltage inputs 0–2.5V: connect directly between OC/AIN (pin 5) and Ground
- Voltage inputs above 2.5V: connect through voltage divider resistors. See the User Manual for the values. Halytech does not supply these resistors.
- SDI-12 sensors: connect to SDI-Data (pin 6) and Ground (pin 7). Power the sensor from LV OUT (pin 8), PWR OUT (pin 2), or an external supply.
- Modbus RS-485 sensors: connect to RS485 D– (pin 3), RS485 D+ (pin 4) and Ground (pin 7). Power the sensor the same way.

Do not apply more than 2.5V directly to the analogue input. It may damage the input.

The sealing cap in the box is for the Halytech Comm Port, not for the M12 sensor connector. Fit it after you finish configuration. Remove the LANlink cable or HLink dongle first. See Section 13.

10. Connect External Power (Optional)

You can connect external power or a solar panel to the 6-pin Halytech Comm Port on the top end cap. Above 9V, the external supply powers the whole unit. This includes the modem. This is optional. The Borewatch runs on the internal battery alone.

- Input voltage: 12–22V DC

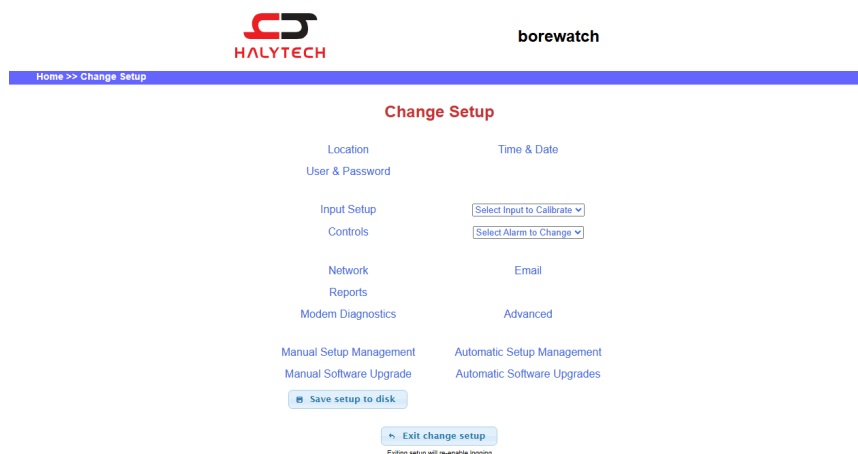
Use a 12V solar panel only. Connect a 12V panel directly. Do not connect a higher voltage panel, such as 24V, direct to the Borewatch. The input has only limited over-voltage protection, and a higher voltage will likely damage the unit. If you must use a higher voltage panel, run it through a regulated solar controller set to 12–22V.

The internal battery is not rechargeable. External power runs the unit, but it does not charge the battery.

See the Borewatch User Manual for the connector pinout and the solar wiring detail.

11. Configure the Borewatch

Do these steps in order the first time you set up the unit. Every page below is under **Change Setup**.



1. **Set location name and site ID** — navigate to **Change Setup** → **Change Location / Site ID**:

- **Location name:** up to 16 characters. It appears in SMS alerts, report filenames, and the web interface.
- **Site ID:** a second identifier. It appears in reports.
- **Modem phone number:** type the phone number of the SIM card. The unit does not read it from the SIM.

2. **Configure network** — navigate to **Change Setup** → **Change Network Settings**:

- Set **Method** to **Mobile Internet (Modem)**.

- Enter the **APN** for your SIM card. Ask your carrier for the correct value.
- Leave **Authentication** off unless your SIM needs it.
- The **Primary network** carries reports, emails, NTP, and software updates. The **Secondary network** carries reports only, as a backup.

Primary Network	
Method	Mobile Internet (Modem) ▼
APN	
Authentication	☐
Data limit	1.000 MB/day
Report signal strength	☒
Signal strength name	Modem Signal
Signal strength format	Percentage (%) ▼
Modem phone number	

Secondary Network	
Method	None ▼

3. **Configure inputs** — navigate to **Change Setup** → **Change Input Setup**. For each channel set the **Type**, **Name**, **Units**, and **Logging period**:

- The cog icon opens extra options for that channel.
- The magnifying glass icon asks the sensor for a new reading. Use it to check your wiring.
- **General logging period**, at the bottom of the page, applies to every channel set to **General**.


borewatch

Home >> Change Setup >> Change Input Setup

Change Input Setup

? Help

	Type	Source	Name	User ID	Units	Logging
1	Disabled ▼					
2	Disabled ▼					
3	Disabled ▼					
4	Disabled ▼					
5	Disabled ▼					
6	Disabled ▼					
7	Disabled ▼					
8	Disabled ▼					
9	Disabled ▼					
10	Disabled ▼					
11	Disabled ▼					
12	Disabled ▼					
13	Disabled ▼					
14	Disabled ▼					
15	Disabled ▼					
16	Disabled ▼					
17	System (Moisture) ▼	Moisture	Moisture Internal	16		1h ▼
18	System (Voltage) ▼	External Power	Power In	17	V	1h ▼
19	System (Voltage) ▼	Battery	Battery1	18	V	1h ▼
20	System (Temperature) ▼	Temperature	Temp Internal	19	C	1h ▼

General logging period: 5m ▼

General fast logging period: 5m ▼

Logging offset: 00 hours 00 minutes

The Borewatch logs every channel at midnight each day. This happens whatever logging period you set.

SDI-12 sensors

Set the channel **Type** to **SDI-12**. Then click the cog icon on that channel to open its **Options** dialog. Set these fields there:

Field	What to enter
Device address	The address of the sensor. Range 0–9, a–z, A–Z. Every SDI-12 sensor on the line needs its own address.
Command	The SDI-12 command that reads the sensor. The Borewatch supports M, C, CC, R and RC. Read the sensor manual for the right one.
Parameter	Which value to log, counting from 1. A sensor that returns three values needs three channels, with Parameter 1, 2 and 3.

Click the magnifying glass icon to send a raw SDI-12 command to the sensor and read the reply. Use it to check the address and to see how many values the sensor returns.

Modbus RS-485 sensors

Set the channel **Type** to **Modbus-485**. Then click the cog icon on that channel to open its **Options** dialog. Set these fields there:

Field	What to enter
Device address	The address of the sensor. Range 1–255. Every Modbus sensor on the bus needs its own address.
Function	The read type. 1, 2, 3 or 4. Read the sensor manual.
Data address	The register to read. Range 0–65535. Read the sensor manual.
Data type	How the Borewatch reads the value. Integer in 16-bit or 64-bit. Float in 32-bit or 64-bit. Read the sensor manual for the right one.

Temperature Options
? Help

This channel's options have been changed from their defaults. Changed options are highlighted in orange.

Default ID
0

Log difference in reading over logging period
☐

Minimum change required to log
0.000

Warmup source
Low Voltage Out

Device address
1

Function
3 (Holding Register)

Data type
Float (32-bit, MSW)

Data address
8

Number of Retries
3

Retry Interval
5s

Test Sensor Configuration

Diagnostic Trace [+]

Sampling period
Same as logging

Cancel OK

Click **Test Sensor Configuration** in the same dialog to read the sensor once and check your settings.

Set the baud rate, parity and stop bits under **Change Setup → Advanced Settings**. They must match the sensor. The defaults are 19200 baud and Even parity.

The water level channel

The Borewatch reports standing water level from a pressure sensor in the bore. The sensor measures head, which is the depth of water above the sensor. The Borewatch works out the level with this formula:

SWL = OFFSET – Head

You do not work out OFFSET yourself. The device calculates it during calibration.

1. Set up the pressure sensor as a channel. Name it, for example, `Head`. Set the **Units** to `m`.
2. Calibrate that channel so it reads head in metres. Navigate to **Change Setup** and pick the channel from the **Select Input to Calibrate** dropdown. For a 4–20 mA sensor, enter the real value at 4 mA and the real value at 20 mA. For other sensor types, see the User Manual.
3. Set up a second channel and set its **Type** to **SWL**. Name it, for example, `Water Level`. Set the **Units** to `m`.
4. Select the head channel as the input to the SWL channel.
5. Dip the bore and measure the standing water level by hand.
6. Calibrate the SWL channel. Enter your dipped measurement as the desired value. The device calculates OFFSET from that.

Calibrate the SWL channel once, when you commission the unit.

One sensor can fill more than one channel. Each value the sensor returns takes one of the 20 channel slots.

If a Modbus sensor returns an exception, subtract 1 from the data address and try again. Modbus counts registers from 0, but some sensor manuals count from 1.

See also: *SDI-12 and Modbus sensor setup · Standing water level · Input channel calibration*

4. **Configure outputs** — navigate to **Change Setup** → **Change Controls**. Name each control. Set the warmup time if the control powers a sensor

5. **Configure email** — navigate to **Change Setup** → **Email**:

- **"From" email address:** an address that identifies the unit, e.g. `your.borewatch@yourcompany.com.au`
- **SMTP mail server:** your preferred SMTP server, e.g. `your.preferred.smtp.server`
- Leave **Authentication** turned off. Most customers do not need it.
- Click **Save**, then enter your address and click **Send Test Email** to confirm delivery

The Borewatch does not support SSL or TLS. If you use a corporate mail server, check that it accepts connections on port 25 without encryption. If the server does not accept port 25, turn on **Authentication**. The unit then uses port 587. Gmail does not work with the Borewatch.

6. **Configure alarms** — navigate to **Change Setup** → **Change Alarm Setup**. The Borewatch holds up to 16 alarms.

Name your channels before you set up any alarm. The Trigger source dropdown lists channels by name. An unnamed channel appears as "New Channel" everywhere.

For each alarm, set these fields:

Field	What to enter
Alarm name	A name for this alarm. It appears in the alarm list and in the log.
Trigger source	A channel, or Date / Time, or Periodic, or Super Alarm. The page reloads after you pick one.
Trigger condition	Above, Below, or Change of.
Trigger level	The value that triggers the alarm, in the units of the channel.
Qualifying time	How long the condition must hold before the alarm goes active. It stops a brief spike from raising an alarm.
Message	The text sent in the SMS and the email.
Send alarm report	Disabled, Once only, Two times, or Repeat.
Fast logging	Turn this on to log faster while the alarm is active.
Auto acknowledge time	How long after triggering the device acknowledges the alarm by itself.
Phone numbers	Up to three numbers, for SMS alerts.
Email addresses	Up to three addresses, for email alerts.

Keep the message to 32 characters or fewer. The device cuts longer text when you save, and it gives you no warning.

A worked example — low battery

Replace the battery pack below 7.0 V. This alarm tells you before a site visit is due.

Field	Value
Alarm name	Low Battery
Trigger source	Battery1 — the battery voltage system channel
Trigger condition	Below
Trigger level	7.0
Qualifying time	3600 seconds
Message	Low battery - replace pack
Send alarm report	Once only
Email addresses	The person who orders the replacement pack

The alarm sends alerts only while it is active and unacknowledged. After it sends once, it will not send again until two things happen. Someone acknowledges it, and the voltage rises back above 7.0 V and then falls below again.

See also: [Alarms · Alarm status codes](#)

7. **Configure reports** — navigate to **Change Setup** → **Change Report Settings**. The Borewatch has two report slots. They work independently:
- **Reports to send:** Email, FTP 1, FTP 2, HTTP, or any combination.
 - **Period:** from 1 minute to 1 day.
 - **Offset:** the delay from the start of the period. For a daily report at 6:30am, set the offset to 6h 30m.
 - Turn on **Enable recovery**. Any data that failed to send goes in the next report.
8. **Set up automatic software upgrades** — Change Setup → Automatic Software Upgrades. This is off by default. Turn it on unless your site rules say otherwise.
9. **Save setup to disk** — navigate to **Change Setup** → **Manual Setup Management**. Click **Save setup to disk**. Keep the `.cfg` file as a backup. You can also load it into another unit at a similar site.
10. **Reset report starting point** — this marks all logged records as already sent. It keeps your test data out of the first real report

Some browsers warn that a `.cfg` file may be harmful. The warning is wrong. Dismiss it and save the file.

Most configuration pages have a help button.

12. Deploy in Bore

1. Hang the sensor cable from the support lug at the bottom of the Borewatch. You can also use a separate mounting point. Do not let the connector carry the weight of the cable.
2. Hang the Borewatch from the top suspension lug. Secure it. Mount it as high in the bore as is practical. Only the sensor goes down to depth on its cable.

Keep the Borewatch out of the water. A submersible level sensor has a vent tube or a reference port. That vent runs up the sensor cable to the Borewatch. If the Borewatch goes under water, the vent goes under water too, and the sensor gives a wrong reading. Mounting it high also makes it easy to reach for service.

3. Antenna placement:
 - If the bore extends above ground and uses plastic pipework, the antenna can be mounted inside the bore casing.
 - If not, run the antenna cable out of the bore. Mount the antenna outside.

13. Final Checks and Hand Over

Before you leave site, check:

- Mobile signal strength is Acceptable or better — see the table below
- Signal Quality shows at least three of the four boxes filled
- Location name and site ID set
- Date and time correct
- All inputs reading correctly
- Password changed from default
- APN configured and modem connected
- Test report sent and received
- Halytech Comm Port fitted with the supplied sealing cap (after removing the LANlink cable / HLink dongle)
- Setup saved to disk as backup

14. Site Visit Checks

On each site visit, check:

- **Battery voltage** — check it on the web interface. Replace the battery below 7.0V, or add external power
- **Signal strength and quality** — check both in Modem Diagnostics. Move the antenna if the strength is Poor, or if fewer than three Quality boxes are filled
- **Connectors** — check for corrosion or damage. Check the Halytech Comm Port sealing cap is fitted
- **Sensor readings** — check the readings. Fix any problems before you leave site

15. Troubleshooting

Symptom	Likely cause	Action
No signal strength shown	Antenna not connected, or SIM not activated	Check the SMA antenna connection on the top end cap. Check the SIM is activated with the carrier
Registration failed	Wrong APN, antenna fault, or SIM not activated	Check the APN matches your carrier. Check the antenna. Check the SIM is activated
Signal present but SMS send fails	The SIM plan does not allow SMS	Ask the carrier to enable SMS on the SIM
Signal present but email fails	Wrong APN, SMTP or email address, or mobile data not enabled on the SIM	Check the APN. Check the SMTP server settings. Check the To and From email addresses. Check mobile data is enabled with your carrier

16. Accessories

Item code	Description
HBT-001	Spare battery pack — 7.2 V Li-SOCl ₂ , 13 Ah
HBW-003	Borewatch M12 input cable — M12 connector on a 5 m lead

Order through your Halytech sales contact.

Borewatch Quick Start Guide — Halytech See the Borewatch User Manual for the full installation and configuration detail.



Halytech Pty Ltd

Unit 11, 22 Lexington Drive
Bella Vista, 2153
NSW, Australia
ABN 51 094 853 068

+61 2 8814 5235
support@halytech.com.au
halytech.com.au

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