



Spider 2

User Manual

Model	HSP-050
Date	September 2026

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1. Introduction

1.1 Overview

Spider 2 is a compact, low power telemetry, logging and alarm system. It is designed for remote and battery-powered applications. It monitors inputs, controls relay outputs, raises alarms and logs data.

You set up and use Spider 2 with any standard web browser. No special software is needed. Connect locally by cable or WiFi, or remotely over the mobile network or a LAN.

Spider 2 is one self-contained unit. It has a built-in 4G modem, a WiFi hotspot and a 100,000-record non-volatile logger. Easy Connect makes the first setup simpler. The built-in battery charger accepts solar panels or mains power supplies.

The Spider 2 does not run Modbus. It cannot read Modbus meters or instruments, and it cannot serve its data over Modbus TCP/IP. Its RS-485 terminal is not used. Both Modbus functions are Spider 2 AMR features. If your application needs them, the Spider 2 AMR uses the same hardware and web interface, with Modbus added.

1.2 Package Contents

Item	Notes
Spider 2 logger (HSP-050)	Compact self-contained unit — Polymer enclosure with mounting points
Mobile whip antenna (main)	4G 5dB, 5m cable, SMA with pole/wall mount bracket.
Mobile puck antenna (diversity)	Low-profile IP67, 3m cable, SMA
LAN cable	For setup
Mating connectors	Plug-in connectors with screw terminals, for the inputs, outputs, RS-485, CHG and Batt
Current sense resistors	8 × 120Ω, one per input, for 4–20mA and 0–20mA loops
Protection diodes	8 × 1N4004, one per relay output, for DC relay coils

Note: Spider 2 batteries, solar panels and mains power supplies are available from Halytech

and its agents.

1.3 Typical Applications

Spider 2 is a general-purpose monitoring and control logger. Use it where you need to monitor inputs, schedule controls, log data or raise alarms. Typical applications are:

- **Trade waste monitoring** — continuous logging, scheduled compliance reports, and instant alarms for trade waste and environmental discharge monitoring
 - **Building monitoring** — monitor building services such as power, water, temperature, and access events without the cost and complexity of a full BMS system
 - **BMS and building system watchdog** — independent secondary monitoring layer that sends alarms when the primary system misses a fault
 - **Environmental monitoring and flood alert** — standalone remote monitoring with SMS and email alarms, no site infrastructure required
 - **Pump station monitoring** — monitor pump status, levels, and flows. Alert on fault conditions
 - **Rural and remote site monitoring** — low-power, solar-ready deployment with 4G reporting where there is no fixed infrastructure
 - **Water and waste water monitoring** — monitor flows, levels and quality across water and waste water sites. Log the data and raise SMS or email alarms when a threshold is crossed
 - **Irrigation monitoring** — monitor valve state, pump status and flow. Alarm on a fault
 - **Tank level monitoring** — send alerts to the services team for pump-out or top-up of the tank
-

2. System Overview

2.1 Inputs

Spider 2 has 8 user inputs, printed IN 1 to IN 8 on the case. Each one can be set as analogue or digital. The unit also has internal system monitor channels for battery voltage, charger status and enclosure temperature.

Set each **user input** to one of these modes. For the connectors and wiring, see section 3.3.

Mode	Description
Switch	Voltage-free contact, ON/OFF. Active state = terminals shorted. Must be stable for at least 3 seconds to register.
Analogue	Native input range 0–2.5V DC, connected direct. 0–5V, 0–10V, 4–20mA and 0–20mA all need external components on the input — see section 3.3. 12-bit resolution. All analogue inputs share a common ground. 2-point user calibration.
Counter	Increments on each terminal short. Up to 10Hz. Rolls over at 999,999.999.
Event	Records pulse occurrences. Minimum pulse width 100ms.
Daily Total	As Event, but counter resets at midnight.
Utility Meter	Records consumption during each logging period. Also records one cumulative meter reading per day as a separate channel (channel name suffixed with _reading). Typical use: water, electricity and gas meters.
Hydstra Rain	Tipping bucket rainfall recording (hydrographic software only).
Disabled	Input switched off. It does not appear on the Status page or in the setup lists.

Every input type can be logged and can trigger alarms.

2.2 System Monitors

Spider 2 has three built-in system monitors. They work like inputs. They can be logged and can trigger alarms.

Monitor	Description
System Temperature	Temperature inside the Spider 2 enclosure
Battery Voltage	Voltage of the connected external battery
Battery Charger Status	Charger ON / OFF

2.3 Controls

Spider 2 has 8 relay outputs, CN1 to CN8. For the connectors and the contact rating, see section 3.4.

A control can be switched in four ways:

1. From the Controls page in the web interface
2. By SMS command
3. By a programmed timer schedule
4. Automatically, by a programmed alarm

Each control has its own 7-day timer. The timer divides each day into 96 blocks of 15 minutes. You set each block to ON or OFF.

If a timer is enabled and a manual command arrives, the manual command overrides the timer. The override clears by itself when the timer reaches the matching state.

An alarm has the highest priority. It overrides both manual and timer control. If two alarms conflict on the same output, OFF overrides ON.

2.4 Alarms

Spider 2 can generate up to 16 alarms. On activation, an alarm can:

- Send SMS messages to up to 3 phone numbers
- Send email to up to 2 addresses
- Activate or deactivate a control output

Section 4.9 lists the settings for each alarm. It also explains how the unit sends SMS and email, and how to acknowledge an alarm.

2.5 Logger

Spider 2 has a 100,000-record data logger. It stores the records in non-volatile eMMC memory, so the data is kept through a complete power failure.

Each record has a date and time stamp, to a resolution of one second. When a network connection is available, the clock synchronises automatically by NTP.

The logger records:

- Input state changes (switch inputs)
- Analogue and counter values (significant-change logging)
- System monitor values
- Control state changes
- Alarm activations and acknowledgements
- SMS and email transmissions and outcomes
- System messages

Logged data is downloaded as a CSV file from the History page.

2.6 Display and Black Button

Spider 2 has a display and the black button. The display is a 16-character × 2-line backlit LCD. It shows input readings, alarm states, control states, battery voltage, signal strength and network settings. You do not need a computer to read them. Section 5.1 lists the screens.

2.7 Web Server

Every Spider 2 has a built-in web server. Use any standard web browser to reach it. You use the web interface for:

1. Initial setup and configuration
 2. Viewing inputs and system monitors
 3. Controlling outputs
 4. Viewing and acknowledging alarms
 5. Downloading logged data
 6. Software upgrades
-

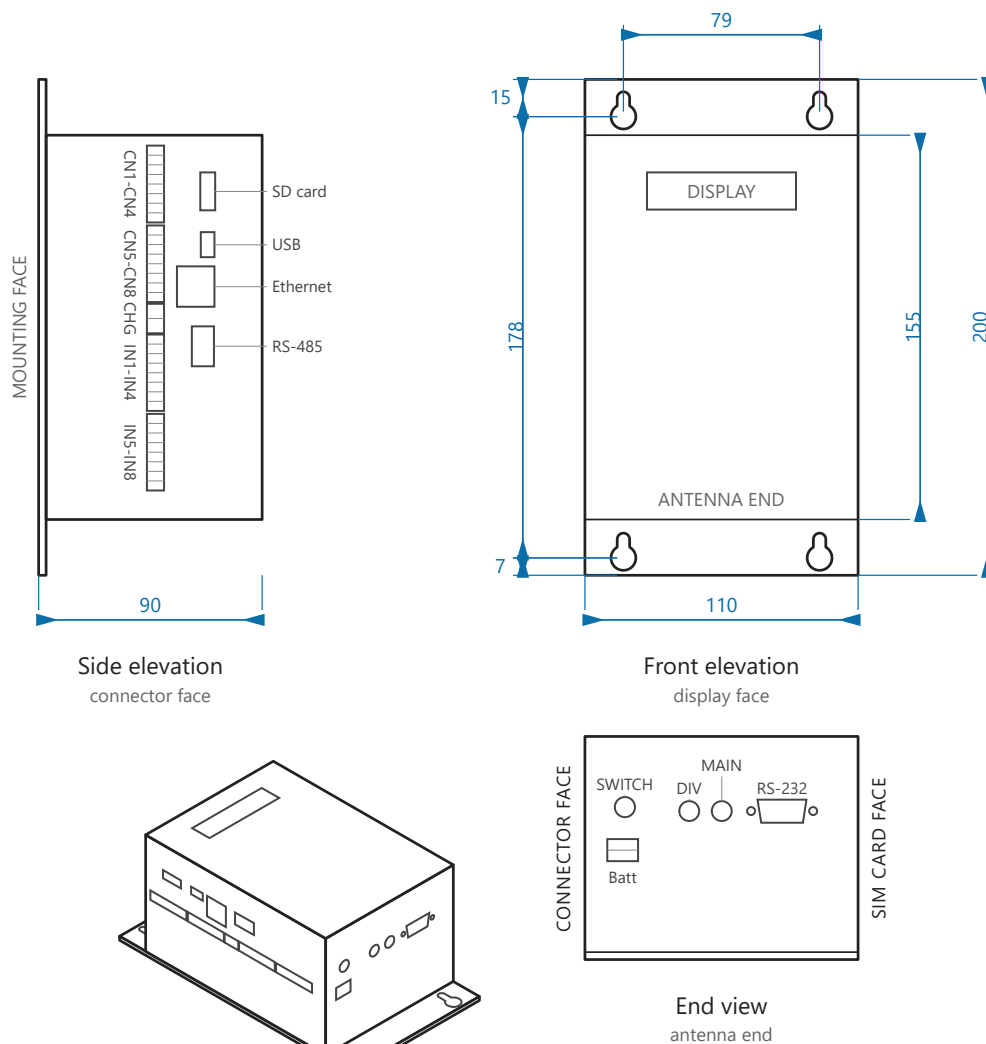
3. Installation

Audience: Installer

3.1 Mounting

Spider 2 uses a keyhole wall mount. Mounting centres: 79mm (W) × 178mm (H).

1. Mark and fix two screws to the wall at the mounting centres.
2. Hang the Spider 2 on the screws via the keyhole slots on the rear of the unit.



Keyhole: 10 dia head, 5 wide slot, 15 long.
Leave 75 clear for cabling on the left and at the bottom.

Dimensions in mm

Spider 2 has an IP-20 enclosure rating. Install it inside a suitable IP-rated enclosure, for protection against dust, moisture and physical contact.

Position the unit to allow:

- Cable entry from below where possible. In an external enclosure, this reduces the risk of water getting in
- Clear access to the black button and display for commissioning and status checks
- A clear path for antenna cables to an external mounting location for best mobile signal

3.2 Power Wiring

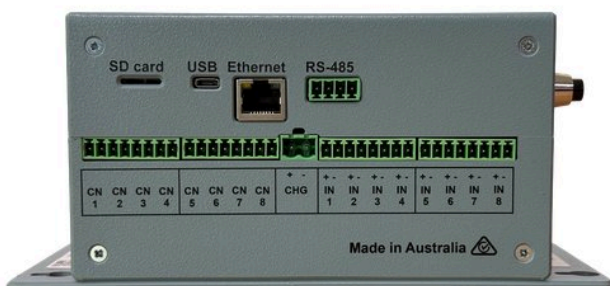
For what happens when power is connected, see section 3.9.

There are two power connectors:

- **Batt** (Battery) — connects an external 12V sealed lead acid battery (up to 10Ah). It is on the antenna end of the unit
- **CHG** (Charger) — connects an external solar panel or mains charger (16–24V DC, 3A minimum). It is on the connector end of the unit

Observe correct polarity when connecting the battery and charger.

Note: Spider 2 can draw up to 3A while the backup battery is flat. Size the charger or power supply for this.



Connector end



Switch and antenna end

Note: If you use a battery larger than 10Ah, or your own external charging system, connect the battery to the Batt connector only. Leave the CHG connector unconnected. Battery voltage monitoring and logging still work normally.

3.3 Native Inputs (IN 1 – IN 8)

The eight native inputs are on two multi-pole connectors, four inputs on each connector. Each input has two screw terminals. Use wire up to 1.5mm².

Note: There is no galvanic isolation between inputs or between inputs and internal circuitry.

Wiring by input type:

Switch, Counter, Event, Daily Total, Utility Meter, and Hydstra Rain inputs:

Connect the sensor between the input terminal (+) and system ground (–).

Analogue inputs — current loop (0–20mA or 4–20mA):

Fit a 120Ω resistor across the input terminals. Eight are supplied with the unit, one for each input.

2-wire sensors

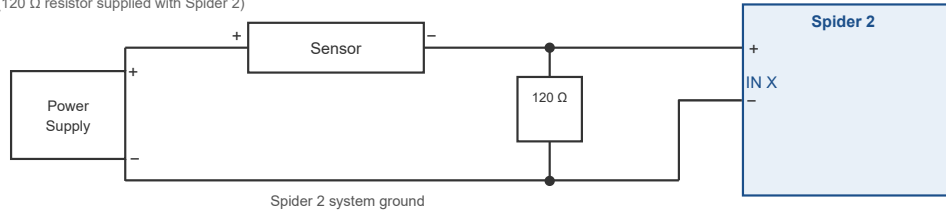
1. Connect the power supply positive to the sensor positive.
2. Connect the sensor negative to the input terminal (+).
3. Fit the 120Ω resistor across the input terminals (+ and –).
4. Connect the power supply negative to system ground (–).

4-wire sensors

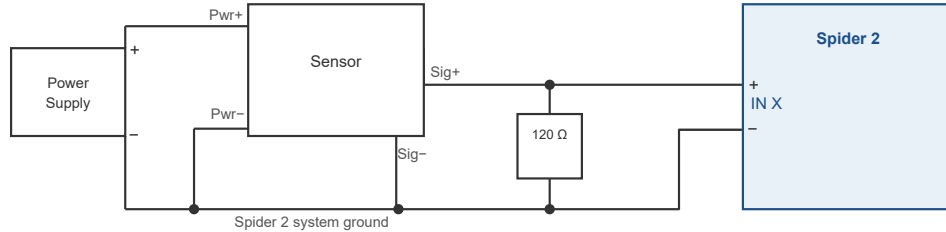
1. Connect the power supply to the sensor power pins.
2. Connect the sensor output positive to the input terminal (+).
3. Connect the sensor output negative to system ground (–).
4. Fit the 120Ω resistor across the input terminals (+ and –).

Analogue Input Wiring — Current Loop

2-wire — 0–20 mA / 4–20 mA
(120 Ω resistor supplied with Spider 2)



4-wire — 0–20 mA / 4–20 mA
(120 Ω resistor)



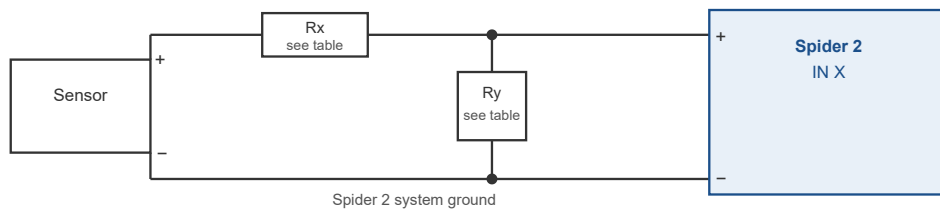
Analogue inputs — voltage (0–5V and 0–10V):

Inputs above 2.5V need voltage divider resistors. **These are not supplied with the unit.** Use the values below:

Sensor range	Rx	Ry
0–2.5V	None	None
0–5V	1k Ω ¼W metal film	1k Ω ¼W metal film
0–10V	3.3k Ω ¼W metal film	1k Ω ¼W metal film

Analogue Input Wiring — Voltage Input

Rx and Ry resistors may be required depending on sensor output range (see table below)



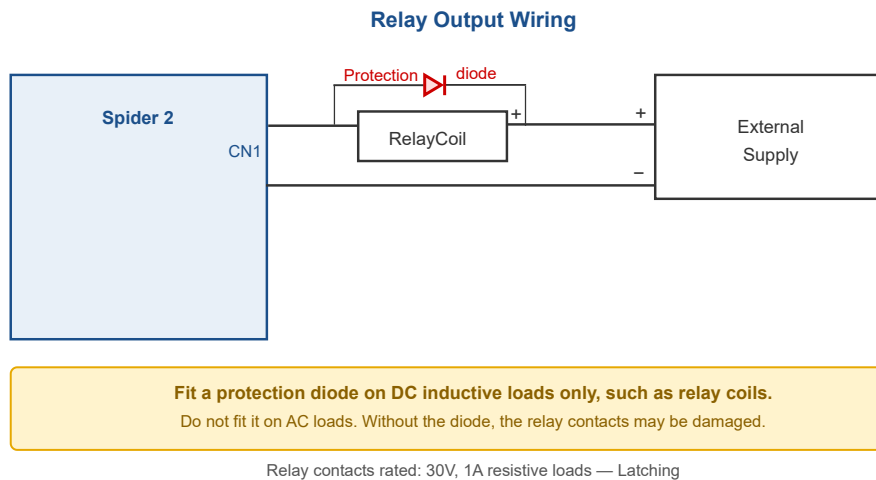
Sensor Range	Value of Rx	Value of Ry
0 – 2.5 V	None required	Leave out
0 – 5 V	1 k Ω ¼ W metal film	1 k Ω ¼ W metal film
0 – 10 V	3.3 k Ω ¼ W metal film	1 k Ω ¼ W metal film

Note: the 12V Output on RS-485 Pin 1 can power analogue sensors

Tip: The 12V Output on RS-485 Pin 1 can supply power to analogue sensors. See section

3.4 Relay Outputs (CN1–CN8)

The eight relay outputs, labelled CN1 to CN8, are on two multi-pole connectors, four on each connector. Each output has latching relay contacts rated at 30V AC or DC / 1A, non-inductive. Use them for low voltage, low current loads only.*



* Do not connect directly to mains loads, contactors, or motors.

For **DC** inductive loads, such as relay coils, fit the supplied flyback diode across the load. Without it, the switch-off voltage spike arcs the contacts and erodes them well below the 1A rating.

Flyback diodes work on DC only. **Do not fit them on AC loads.**

Mount intermediate relays and other inductive coils next to the unit. Keep CN-to-coil leads short. Fit the diode at the coil.

3.5 RS-485 and 12V Output

The connector printed **RS-485** is a 4-pin connector. It provides an RS-485 port and a 12V Output.

Pin	Function
1 (left, nearest LAN)	12V Output
2	RS-485 D+
3	RS-485 D-
4	Ground

Caution: The 12V Output on Pin 1 is unprotected. A short to ground may damage the unit. Do not route Pin 1 through any RS-485 cable run — it is intended for local sensor power only.

12V Output characteristics:

- Voltage: the larger of battery voltage or charger voltage
- Maximum current: 500mA
- The output is not software controllable. It follows the CPU board.
- In low power mode the unit sleeps between logging times. The output is off while it sleeps.

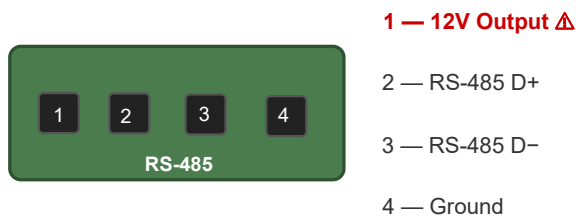
To power a 2-wire 4–20mA sensor from Pin 1, connect Pin 1 to the sensor positive. Connect the sensor negative to the input terminal (+). Fit the 120Ω resistor across the input terminals (+ and –).

Powering a 4–20mA sensor from Pin 1:

- The unit is a 12V system.
- Size a 2-wire loop on the battery voltage, about 12V. Do not rely on the higher voltage while the battery charges.
- The 120Ω resistor takes 2.4V at 20mA. About 9.6V is left, so a 2-wire sensor on Pin 1 must work from 9V or less.
- If the sensor needs more than about 9V, use the 4-wire version of the sensor. If there is no 4-wire version, power the sensor from an external 24V supply.

- Add up every sensor and other load on Pin 1. Keep the total well under 500mA.

RS-485 Connector Pinout



⚠ Pin 1 is unprotected — do not route into an RS-485 cable run

Note: The RS-485 port hardware can run Modbus RTU. The standard Spider 2 software does not offer Modbus at this stage. See section 1.1. If your application needs Modbus, contact Halytech.

RS-232

The DB9 connector printed **RS-232** sits on the antenna end. The standard Spider 2 software does not use it. Do not connect anything to it.

3.6 SIM Installation

Spider 2 needs a nano SIM card to communicate over the mobile network.

The carrier must enable four things on the SIM. Each one is separate. A SIM can have one and not the others.

Item	Why it is needed
SMS out	Alarm SMS and command replies
SMS in	SMS commands sent to the unit
Internet data	Email, automatic reports, and NTP time sync
The data APN name	You enter this in Change Setup, then Network. Get the name from the carrier. See section 4.10

Remote browser access needs a fifth item: a public dynamic IP address on the SIM.

- Most SIMs do not include one. You must request it from the carrier.
- Not every carrier offers it. Check with your own carrier **before** you order the SIM.

- The APN name for it is carrier-specific. Telstra uses **telstra.extranet**. Other carriers use their own name — ask the carrier.
- The address is dynamic, so it changes. This is why the **GPRS** SMS command asks the unit for its current address before each session. See section 5.8.

A standard data SIM without a public IP address still works for everything else, such as alarm SMS, alarm email and automatic reports.

Before installing the SIM:

Disable any PIN on the SIM card. To do this, put the SIM into an Android phone. Remove the PIN in the phone's SIM security settings.

Important — iPhone users: Turn iMessage off before you put the SIM into an iPhone to disable its PIN. Keep it off until you remove the SIM. If iMessage is active on the SIM number, an SMS sent to that number may reach the iPhone as an iMessage. It then never arrives at the Spider 2. See Appendix C for the test and the fix.

Installing the SIM:

1. Push the SIM tray button (on the side of the unit) to release the tray.
2. Place the nano SIM into the tray with the gold contacts facing the same direction as the display.
3. Push the tray back into the unit until it clicks into place.



Note: Do not insert or remove the SIM while the unit is powered on.

3.7 LAN Connection

The LAN port is a standard RJ-45 Ethernet connector. It is used for:

- Direct connection from a PC for local access and initial configuration
- Connection to a local area network (LAN) or wireless router

If the unit is standalone and not connected to a LAN, Easy Connect must be **enabled** (factory default). If the unit is connected to a LAN, Easy Connect must be **disabled**. See section 4.10.

For the connection procedures, see section 4.1.

3.8 Antenna Installation

The two SMA mobile antenna connectors are on the bottom of the unit.

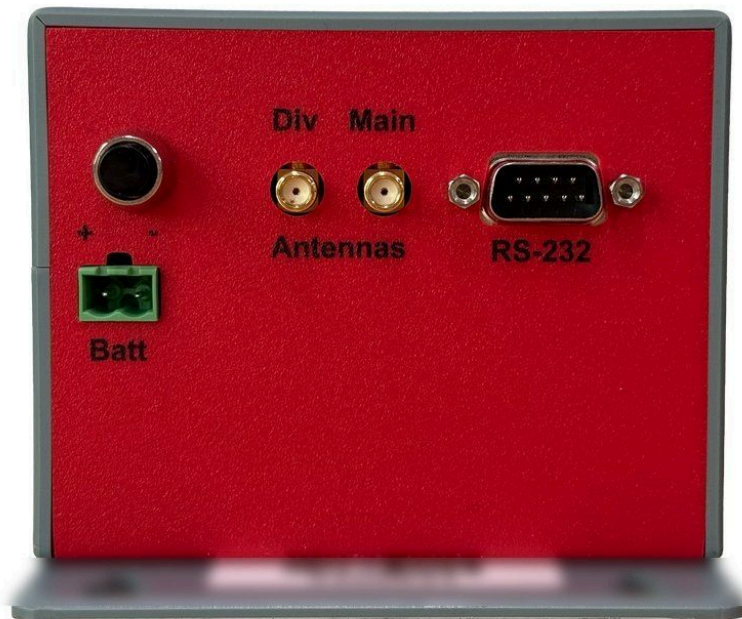
Mobile whip antenna (main)

Mount it externally for the best mobile signal. Tighten the SMA connector by hand only. Tools may damage antenna connectors and void the warranty.

For sites with fringe coverage, other antennas are available from Halytech.

Mobile puck antenna (diversity)

You can surface-mount the puck antenna on or near the enclosure. Tighten the SMA connector by hand.



3.9 Power On

Spider 2 has no ON/OFF switch. It starts as soon as power reaches the CHG or Batt connector.

1. Switch on the power supply.
2. Wait for the display to start.
3. If the display stays blank, press the black button. The unit is in low power mode.
4. Wait while the display shows **Please Wait...** Waking can take up to 30 seconds.

The unit now runs from the power supply and charges the battery.

4. System Configuration

Audience: Installer / advanced user

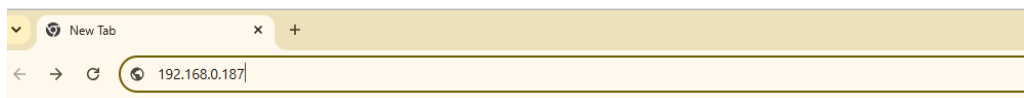
4.1 Connecting for the First Time

Connect to the Spider 2 with a web browser. There are two ways in, by cable or by WiFi.

First, wake the unit. Look at the display. If the backlight is off, press and hold the black button until it turns on. Waking the unit starts both the WiFi and the LAN port. A browser cannot connect to a sleeping unit.

Option A — Easy Connect (LAN cable)

1. Connect the supplied LAN cable between your laptop's LAN port and the Spider 2 LAN port.
2. Open a browser.
3. Go to **192.168.0.187** in the address bar.



The display also shows the unit's own address. To see it, press the black button until the address appears.

Note: The Spider 2 login page should open. If the browser shows an error page instead, see Appendix D.

Option B — WiFi

1. Press the black button briefly until the display shows the WiFi screen:

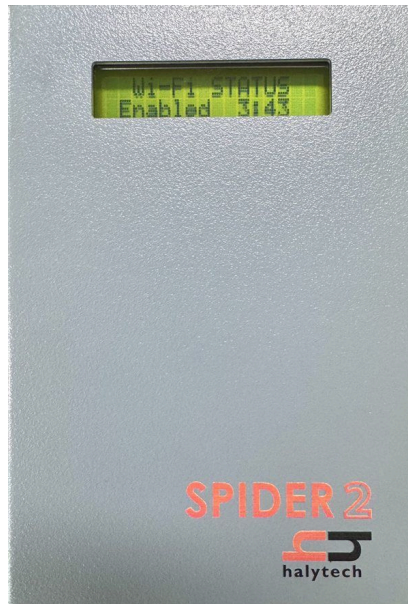
A screenshot of the Spider 2 display. It shows two lines of text in a simple, sans-serif font. The first line is 'Wi-Fi STATUS' and the second line is 'Enabled 4:05'. The text is white on a dark background.

Wi-Fi STATUS
Enabled 4:05

The countdown is the time the WiFi has left.

2. On your laptop or tablet, open the WiFi settings.

3. Select the network named **192.168.10.1_Spider2_[serial]**, where the serial is the unit's serial number. For example: **192.168.10.1_Spider2_2403002**.
4. Enter the password. The factory-set password is printed on the label on top of the unit.
5. Open a browser.
6. Go to **192.168.10.1** in the address bar. It is the address at the start of the network name.



Note: The WiFi times out. Wake the unit again to restart it.

Note: The Spider 2 login page should open. If the network is not in your WiFi list, the password is rejected, or the browser shows an error page, see Appendix D.

Then log in. From here the two methods are the same.

Log in with the default administrator credentials: username **user**, password **changeme**.

Spider 2 Log In

User Name:

Password:

After you log in, the Alarms page opens.

- Click **VIEW SETUP** to inspect current settings without making changes.
- Click **CHANGE SETUP** to enter configuration mode.

Change Setup

[Change User / Password](#) [Change Date / Time](#)

[Change Location / SMS PIN](#)

[Change Input Setup](#) [Select Control to Change](#)

[Select Input to Calibrate](#) [Select Alarm to Change](#)

[Change Network Settings](#) [Change Power Settings](#)

[Change E-mail Settings](#) [Save Setup to Disk](#)

[Select Report to Change](#) [Restore Setup from Disk](#)

[Advanced Settings](#) [Upgrade Software](#)

[Exit Change Setup](#)

Note: Entering Change Setup mode disables logging and alarm generation, and resets all active alarms. Exit as soon as configuration is complete.

If there is no activity for **10 minutes**, Change Setup mode exits by itself.

4.2 Setting Location Name

Each Spider 2 must be given a unique location name. This name is included at the start of every SMS and email to identify the unit.

1. In Change Setup, click **Change Location / SMS PIN**.
2. Enter a unique name of up to **16 characters**.
3. Click **Save**.

This page also sets the PIN that protects SMS control commands. To disable PIN protection, set the PIN to **0000**.

Change Location / SMS PIN

Location:

SMS PIN: (Enter 0000 to disable SMS PIN)

[Cancel](#)

4.3 Setting Date and Time

1. In Change Setup, click **Change Date / Time**.
2. Check the **Current Date** and **Current Time**, and correct them if needed.
3. To copy the date and time from the computer you are using, click **Set from computer**.
4. Set the **Timezone** for the installation location, in standard time.

Important: Do not add an hour for daylight saving. With daylight saving, the clock jumps forward one hour each spring and back one hour each autumn. This leaves a one-hour gap and a one-hour overlap in the logged data.

5. Enter the address of an NTP server in the **NTP Server** field.
6. Click **Set**.

An address in the NTP Server field turns NTP on. Always leave an address there, so the clock stays correct without manual adjustment.

Change Date/Time

Current Date:

Current Time:

Timezone:

NTP Server:

4.4 Setting Username and Password

There are two access levels:

Level	Default username	Default password	Permissions
Administrator	user	changeme	Full access
Normal user	user	user	View only — no changes

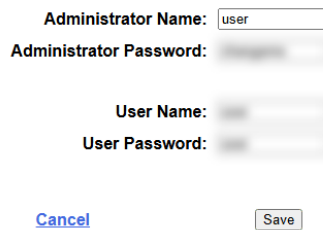
Important: Change both usernames and passwords before the unit goes into service.

Sessions time out after **10 minutes** of inactivity.

To change credentials:

1. In Change Setup, click **Change User / Password**.
2. Enter new usernames and passwords.
3. Click **Save**.

Change User / Password



Administrator Name:

Administrator Password:

User Name:

User Password:

[Cancel](#)

Note: If you forget your username or password, you cannot log in to the unit. Contact Halytech or your agent for help.

4.5 Configuring Native Inputs

1. In Change Setup, click **Change Input Setup**.
2. Set the type of each input. Section 2.1 lists the modes.
3. Enter a descriptive name for each active input (e.g. "Pump 3 status", "Tank level").
4. For analogue, counter and system monitor inputs, set the measurement units.
5. For the same inputs, set the logging period. This is the scan period, and all inputs share it.
6. For the same inputs, set the minimum change to log.
7. Click **Save**.

Change Input Setup

Input #	Type	Name	Units	ID	Warmup	Logging*	Min Change To Log*
1	Utility Meter	Main Meter	kL	01KN001223	-	☒	
2	Analogue	Tank Level	%	TK-101	☐	☒	5.000
3	Disabled				-		
4	Disabled				-		
5	Disabled				-		
6	Disabled				-		
7	Disabled				-		
8	Disabled				-		
Input #	Type	System Monitors	Units	ID	Warmup	Logging*	Min Change To Log*
	System	Battery Charger	-	Battery Charger	-	☒	0.5000
	System	Battery Voltage	V	Battery Voltage	-	☒	0.0000
	System	Unit Temperature	deg C	Unit Temperature	-	☒	0.0000

* Sensor Warmup Period - applies to all inputs with warmup enabled

30 sec

* Hydstra zero event will be recorded every day

0 hr after midnight

* Switch and Event Inputs are logged automatically when they change

* Analogue Inputs, Counter Inputs and System Monitors checked for change every 5 min

* Log modem signal: ☐ No

☒ Yes

Cancel

Save

Logging behaviour:

- Switch inputs are logged automatically on state change.
- Analogue, counter and system monitor inputs use significant-change logging. The unit checks them every scan period. It logs a value only if it has changed by at least the set minimum.
- All enabled inputs of these types are also logged once at midnight, whether or not the value changed.
- Utility Meter inputs are logged every scan period.

4.6 Calibrating Analogue Inputs

There are three methods.

2-point calibration (recommended):

1. In Change Setup, select the input to calibrate from **Select Input to Calibrate**.
2. Select **2-point calibration** and click **Proceed**.
3. Follow the on-screen steps. The two calibration points must be at least half the sensor range apart.
4. Click **Save**.

Calibrate Tank Level

1. Set transducer to minimum value
2. Enter desired reading:
3. [Click here](#) to lock 1st point

4. Set transducer to maximum value
5. Enter desired reading:
6. [Click here](#) to lock 2nd point

[Cancel](#)

Offset change only:

This changes the offset of an input that is already calibrated. The scaler does not change. Use it to correct sensor drift or a known zero-point error.

Manual calibration:

Calibrated value = Scaler × Raw Value + Offset

Enter Scaler and Offset directly.

4.7 Calibrating and Scaling Counter, Utility and Event Inputs

Counter and Utility Meter inputs

There are two options:

- **Scaling:** Set a scaler to convert pulses to engineering units. Example: 1 pulse = 5 litres, so the scaler is 5 to read in litres.
- **Preset (offset):** Set the counter to a specific starting value, e.g. to match the existing meter reading.

A counter rolls over after 999,999.999, whatever scaler you set.

Event, Daily Total and Hydstra Rain inputs

These input types are scaled, not calibrated.

1. In Change Setup, select the input from **Select Input to Calibrate**.
2. Enter a scaler value. The scaled value = raw count × scaler.
3. Click **Save**.

If no scaling is required, leave the scaler set to 1.

Note: A scaled event input does not roll over at 999,999.999. The scaler changes the roll-over value.

4.8 Setting Control Names and Timer Schedules

Each control (CN1–CN8) has its own page. On that page you set the control's name and its 7-day timer schedule.

1. In Change Setup, select the control from **Select Control to Change**.
2. Enter a descriptive name for the control (e.g. "Valve 4 ON", "Main Pump").
3. Set the 7-day schedule using the timer grid — 15-minute resolution, 96 blocks per day.
4. Enable the timer for that control.
5. Click **Save**.
6. Repeat for each control in use.

You do not have to use the controls in order. For example, you can use CN1 and CN3 and leave CN2 unused.

Timer feature	Detail
Schedule resolution	15-minute blocks
Days	7-day grid (Mon–Sun)
Transitions per day	Unlimited ON/OFF transitions
Override	Manual command overrides timer. Override clears when timer reaches matching state
Enable/disable	Timer can be enabled or disabled per control

4.9 Setting Up Alarms

Each alarm has:

- Name
- Trigger source (any native input or system monitor)
- Trigger condition. The choices depend on the input type. A switch triggers on its ON or OFF state. An analogue input triggers above a level, below a level, or on a rate of change. The page shows the choices for the input you select.
- SMS text and up to 3 phone numbers (digits only — no spaces, brackets, or hyphens)
- Up to 2 email addresses
- Optional control action (continuous or pulsed)
- Send Report (YES/NO) — sends an automatic data report when the alarm triggers
- SMS acknowledge time (0–60 minutes, default 30 minutes)
- Auto-acknowledge: ENABLED or DISABLED, with a configurable auto-acknowledge time in minutes

To set up an alarm:

1. In Change Setup, select **Change Alarm 1** (through 16) from the alarm list.
2. Fill in all required fields.
3. Click **Save**.

Retiring an alarm you no longer need:

1. In Change Setup, select that alarm from the alarm list.
2. Set the trigger source to **DISABLED**.
3. Set the name back to **Alarm** plus its number, for example **Alarm 7**.
4. Click **Save**.

Step 3 matters. A disabled alarm that keeps its old name still shows that name on the Alarms page. A reader then looks for a fault that the unit no longer monitors. Resetting the name makes the free slot clear.

Change Alarm 1

Alarm Name:

Trigger Source:

Trigger Level:

Control Action:

Control Type: Continuous (default) ☒ 1 second pulse ☐

Send Report: YES ☒ NO ☐

Message:

Auto Acknowledge: DISABLED (default) ☐ ENABLED ☒

Auto Acknowledge Time: minutes

SMS		E-mail	
Send?	YES ☒ NO ☐	Send?	YES ☒ NO ☐
1st Phone Number:	04328765432	1st Address:	alarms@halytech.com.au
2nd Phone Number:	04328765432	2nd Address:	
3rd Phone Number:	04328765432		
SMS acknowledge time:	10 min		

Alarm SMS format:

The alarm SMS has this format:

Location: SMS text (Send 'RST ALx' to acknowledge)

Location is the location name (see section 4.2). **SMS text** is the alarm message. **x** is the alarm number (1–16).

Example: **Mudgee STP: Pump 1 has failed (Send 'RST AL1' to acknowledge)**

Alarm behaviour:

- When an alarm triggers, the unit sends an SMS to the first phone number.
- If the alarm is acknowledged within the SMS acknowledge time, sending stops.
- If it is not acknowledged, the SMS goes to the next number. The unit makes up to 3 attempts per number before it moves on. There are 3 numbers at most, so up to 9 SMS in total.
- After 3 attempts without acknowledgement, the unit stops sending and waits for the trigger to reset.
- Email is sent to up to 2 addresses at the same time. The unit makes 3 attempts, 3 minutes apart.

Acknowledging alarms:

- Click the alarm on the Alarms page.
- To reset all active alarm transmissions, click the **Click here** link on the Alarms page. The page reads "Click here to reset ALL ACTIVE ALARM transmissions".
- Reply to the alarm SMS with the message you received. You do not need to retype it.

- To acknowledge one alarm, send **RST ALx**, where *x* is the alarm number.
- To acknowledge all active alarms, send **RST ALL**.
- If auto-acknowledge is enabled, the alarm is acknowledged automatically when the auto-acknowledge time has passed since the alarm triggered.

Re-trigger behaviour:

After an alarm triggers, it does not trigger again until it is acknowledged. This is true even if the source goes inactive and then active again.

Note: If the trigger is still active when an alarm is acknowledged, the alarm does not re-trigger until the source goes inactive first.

4.10 Network Configuration

In Change Setup, click **Change Network Settings**.

Easy Connect

Setting	Use
Enabled	Use for direct PC connection — factory default
Disabled	Use where the Spider 2 is connected to a LAN

Easy Connect lets you connect a PC directly, without matching IP addresses by hand. When the Spider 2 is part of a network, disable Easy Connect.

LAN settings

Field	Description
IP address	The Spider 2 IP address on the local network. Also shown on the display.
Network mask	Subnet mask for the local network.
Gateway	IP address of the router providing internet access. Required for email/FTP via LAN. Only shown when Easy Connect is disabled.
Primary DNS	IP address of the primary DNS server. Required for email/FTP via LAN. Only shown when Easy Connect is disabled.
Secondary DNS	IP address of the secondary DNS server. Used if the primary does not respond. Only shown when Easy Connect is disabled.

Get the IP address, gateway and DNS values from your network administrator.

Changing the IP address with the black button

You can also change the IP address and mask with the black button. Before you start, get a static IP address and subnet mask from your network administrator.

1. Press the black button until the display shows the current IP address and mask.
2. Press and hold the black button for 3 seconds. The unit enters IP change mode.
3. Press and hold the black button again to start editing.
4. Set each digit. A long press, more than 3 seconds, adds one to the current digit. A brief press moves to the next digit.
5. After the last digit, go to **Save?**
6. Long-press the black button to save.
7. Power cycle the Spider 2. The new address takes effect after the power cycle.

8. In the web interface, disable Easy Connect in Network Settings.

Connecting the Spider 2 to a LAN:

1. Disable **Easy Connect**.
2. Set the **IP address** to a unique address on the network.
3. Set the **Network mask**.
4. Set the **Gateway**.
5. Click **Save**.
6. Exit Change Setup.
7. Reconnect the LAN cable.

If the new settings need a reboot, the unit reboots to apply them.

WAN settings (4G LTE)

The main setting is the **Access Point Name (APN)**. Your SIM card supplier provides it. Confirm the correct value with your carrier before commissioning.

The **Remote APN** field is optional. You start a remote browser session with an SMS command. Spider 2 then switches to the Remote APN for that session. It returns to the standard APN when the session ends. If you do not need the Remote APN, leave it blank.

Warning: Never enter the Remote APN value in the **APN** field. The Remote APN gives the unit a public IP address. Used as the main APN, the unit sits on a public IP address all the time. That puts it on the open internet permanently, where search engines index it and attackers scan for it. The short session exists to keep that exposure brief.

The **Send Test SMS** button sends a test SMS to the nominated number. It confirms that the unit can send SMS. It does not confirm that the message arrived.

WiFi settings

Spider 2 works as a WiFi hotspot (access point). It creates its own wireless network, so no router or existing WiFi network is needed. Start the WiFi with the black button each session. For the network name and the factory-set password, see section 4.1.

To change the WiFi password, use the **Wi-Fi Settings** section of this page. To keep the factory-set password, leave the password field empty. After you change the password, reboot the unit for the change to take effect.

Network glossary

Term	Meaning
IP address	A unique number that identifies Spider 2 on the network, e.g. 192.168.1.100
Subnet mask	Defines which part of the IP address identifies the network and which identifies the device. Usually 255.255.255.0 for small networks.
Gateway	The IP address of the router that connects the local network to the internet. Required for email and FTP over LAN.
DNS	Domain Name System — translates domain names (e.g. mail.example.com) to IP addresses. Required for email over LAN.
SMTP	Simple Mail Transfer Protocol — the protocol used to send email. Configure the SMTP server address in email settings.
NTP	Network Time Protocol — used to synchronise Spider 2's clock automatically over the internet.
APN	Access Point Name — identifies the mobile data network gateway. Provided by your SIM card supplier.

4.11 Email Configuration

In Change Setup, click **Change E-mail Settings**.

Field	Description
SMTP mail server	Address of the email relay server. Hostname or dotted IP address.
SMTP port	Port used by the SMTP server. Typically 25 (standard), 465 (SSL), or 587 (TLS).
"From" email address	The sender address used in all outgoing emails. Must be valid and acceptable to your mail host. Delivery failure notices are returned to this address.
Test email address	Address used when sending a test email.
Force SSL/TLS	Enable if your mail server requires an encrypted connection.
Enable authentication	Enable if your mail server requires a username and password. Enter the credentials provided by your mail host or network administrator.

Change Email Settings

SMTP mail server: 

SMTP port:

"From" email address: 

Test email address: 

Force SSL/TLS: ☒

Enable authentication: ☒

Username:

Password:

Note: Carrier SMTP servers (e.g. Telstra, Optus, Vodafone) are generally no longer supported for third-party use. Use your organisation's mail server or a dedicated relay service (e.g. SMTP2GO).

Testing email:

1. Exit Change Setup.
2. Press the black button until the **Send test email?** screen is displayed.
3. Hold the black button for more than 3 seconds. The display shows **Email sent OK!** on success, or **Email failed!** on failure.
4. If the test fails, re-enter Change Setup and check your network and email settings.

4.12 Saving and Loading Settings

Settings can be saved to a file on your computer as a backup or as a template for other units.

- **Save:** In Change Setup, click **Save Setup to Disk**.
- **Load:** In Change Setup, click **Restore Setup from Disk**, then browse to the settings file.

Load System Settings

Enter Filename: No file chosen

Warning: Restoring settings from disk overwrites all current settings.

4.13 Exiting Change Setup

Click **EXIT CHANGE SETUP** at the bottom of the Change Setup page. Logging, alarm generation, and all enabled timers restart immediately.

Note: Timer overrides active before entering Change Setup are not reinstated on exit.

4.14 Commissioning Checklist

Audience: Installer

Confirm every item below before you leave site.

- Mobile signal is 40% or better on the display. 50% or better is good.
- The APN is correct and the mobile connection is active.
- NTP is enabled, and the date and time are correct.
- Daylight saving is **not** enabled.
- The location name is set, and it is unique to this site.
- Every active input shows the reading you expect in the web interface.
- Every alarm is configured and tested.
- The administrator password is changed from the factory default.

- If reporting is enabled, an automatic report has arrived at its destination.
 - If SMS is used, a test alarm or a test SMS has arrived.
 - If email is used, the test email has arrived.
 - The settings are saved to disk. In Change Setup, click **Save Setup to Disk**.
-

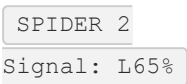
5. Normal Operation

Audience: End user

5.1 Display

Use the display and the black button for quick status checks without a computer.

The default screen shows the mobile signal strength:



The letter (**L** or **S**) shows the brand or model of mobile modem fitted. The percentage is the signal strength. It updates every 5 seconds.

Signal level	Threshold	Action
Excellent	≥75%	No action required
Good	≥50%	No action required
Acceptable	≥40%	No action required
Poor	<40%	Reposition antenna — connection may be unreliable

If the display shows **??** or **—**, there is no mobile coverage, no valid SIM, or the mobile module is not responding. Check that the antenna is connected.

Press the black button briefly to step through the screens:

Screen	Shows
1	Date and time
2	Current input readings
3	Battery charger status and battery voltage
4	System temperature
5	Alarm states 1–4
6	Alarm states 5–8
7	Alarm states 9–12
8	Alarm states 13–16
9	Control states CN1–CN4
10	Control states CN5–CN8
11	LAN IP address and subnet mask
12	Easy Connect status
13	Send test email (hold the black button to send — see section 4.11)

The sequence also includes a WiFi screen, showing whether WiFi is enabled or active.

5.2 Connecting via Web Browser

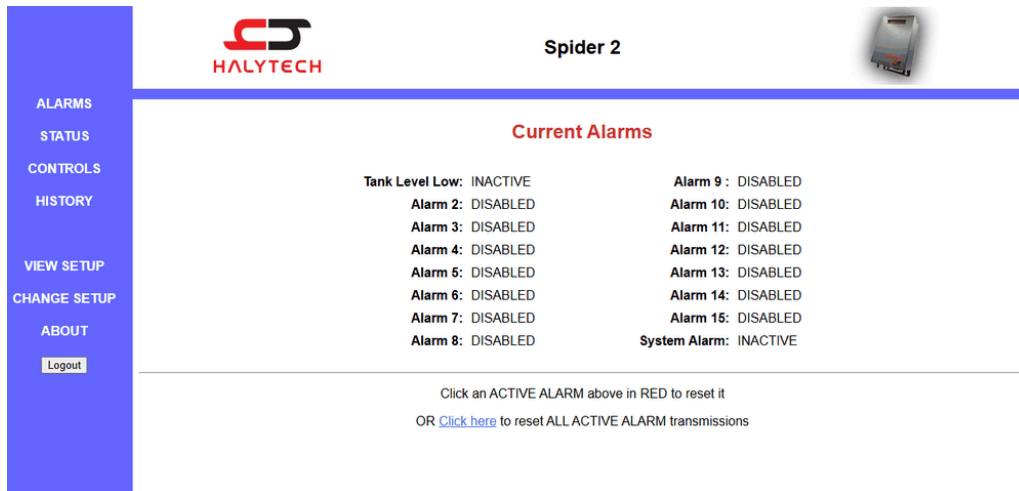
To connect with a web browser, follow section 4.1.

The menu has these links:

- **ALARMS** — view and acknowledge active alarms
- **STATUS** — view current input and system monitor readings
- **CONTROLS** — view and change control states
- **HISTORY** — download logged data
- **VIEW SETUP** — inspect current settings
- **CHANGE SETUP** — modify settings
- **ABOUT** — software version and unit information

5.3 Alarms Page

The Alarms page shows the current state of all configured alarms. The page refreshes automatically every 10 seconds.



Each alarm shows its name and current state: **INACTIVE**, **ACTIVE** (shown in red — click to acknowledge), or **DISABLED**.

The page also shows a **System Alarm**. It indicates an internal fault condition.

An active alarm shows a numerical status code:

Code	Meaning
1	Sending SMS to first phone number
2	Sending SMS to second phone number
3	Sending SMS to third phone number
4	Maximum SMS attempts reached — waiting for reset
RST	Acknowledged but trigger still active — waiting for trigger to go inactive

Acknowledging alarms: Section 4.9 lists every way to acknowledge an alarm. It also shows the alarm SMS format.

5.4 Status Page

The Status page shows current readings for all enabled inputs and system monitors. Refresh the page to get the latest values.

Current Status

Battery Charger: OFF

Battery Voltage: 12.7 V

Unit Temperature: 28.1 deg C

[Cancel](#)

The page has two tables.

Native Inputs

Column	Description
Input #	Input number, IN 1 to IN 8
Name	User-assigned name for the input
Reading	Current value with units

System Monitors

Column	Description
Name	Monitor name (Battery Charger Status, Battery Voltage, System Temperature)
Reading	Current value with units

If the inputs fill more than one page, use the **Select page to view** dropdown to change page. Or click **Next** to step through the pages in order.

5.5 Controls Page

The Controls page shows the current state of each configured control. You can also switch controls ON or OFF from this page.

Current Controls

Control 1: ON ☒ OFF ☐
Control 2: ON ☒ OFF ☐
Control 3: ON ☐ OFF ☒
Control 4: ON ☐ OFF ☒
Control 5: ON ☐ OFF ☒
Control 6: ON ☐ OFF ☒
Control 7: ON ☐ OFF ☒
Control 8: ON ☐ OFF ☒

[Cancel](#)

Save

To change a control, click the ON or OFF button next to it. You can change several controls and then click **Save**. The unit applies all the changes together.

If a timer is active on the control, your command overrides the timer. Section 2.3 explains when the override clears.

5.6 History (Logged Data)

The History page shows logged data. You can download the data as a CSV file and open it in a spreadsheet.

Get History

End Date: 29 04 2022
End Time: 03 53 19
No. of Records: 25
Format: Raw
Direction: Decreasing

[Cancel](#)

Get History

Downloading logged data:

1. Go to the History page.
2. Set the **End Date** and **End Time** — the download works backwards from this point.
3. Set the **No. of Records** to include in the download.
4. Select the **Format**: Raw, Filtered, Alt Filtered, AMR, Wide Filtered, or Utility CAP. See section 5.7 for a description of each format.
5. Set the **Direction**. This orders the rows in the file. **Decreasing** puts the newest record first. **Increasing** puts the oldest first.
6. Click **Get History** — the browser saves the file to your PC.

CSV file format:

The column layout depends on the format you choose.

In the **Raw** format, each row is one logged record with four columns. They are date, time, a numeric identifier and a text description. For an analogue or counter input, the fourth column holds the input value instead. Appendix A lists every numeric identifier.

The **Filtered** format is simpler. Each row holds an input name, a date and time, and a value.

Note: All enabled inputs and system monitors are included in a single download file.

5.7 Automatic Reports

Spider 2 can send automatic reports by email and/or FTP. There are three report types:

Type	Schedule	Contents
Daily	Once per day at a user-set time	All data from the previous 24 hours
Periodic	Every 1, 3, 6, or 12 hours, aligned to real time	Data from the previous reporting period
Ad-hoc	On demand via SMS (RESEND REPr,p) or triggered by an alarm	Current day's data (or up to 7 days past)

The report formats are:

- **Raw** — every logged record: system events, input readings, control changes, alarm activity, and SMS, email, and report outcomes. Each record carries a numeric identifier — see Appendix A for the full list.
- **Filtered** — logged input values only. Each record is an input name, a date/time, and a value.
- **Alt Filtered** — input data only, uses Channel ID rather than Channel Name
- **AMR** — input data in custom format
- **Wide Filtered** — input data with both Channel Name and ID fields
- **Utility CAP** — input data in custom format

Daily reports can recover missed data. If a report fails to send, the next day's report includes the previous day's data, for up to 7 days.

The unit sends each report to up to 3 email recipients, or to an FTP server. It makes up to 3 attempts to send each report.

A report can list its records in ascending or descending time order. Choose the order in the report settings.

Report file naming

Report type	Filename format
Daily	Location_DDMMYY.csv
Periodic	Location_DDMMYY_HHMMp.csv
Ad-hoc (current day)	Location_DDMMYY_HHMM.csv
Ad-hoc (<i>n</i> days ago)	Location_DDMMYY_2359.csv

Location is the first 8 characters of the unit's location name. Spaces are replaced with -.

To set up a report, go to Change Setup and select it from **Select Report to Change**.

5.8 SMS Commands

Spider 2 accepts these SMS commands:

Command	Action
HELP	Returns list of supported commands
GET ST	Current reading of all native inputs (e.g. sensor values, switch states)
GET SYS	Current state of system monitors
GET CN	Current state of all controls
RST AL_x	Reset alarm <i>x</i> (1–16)
RST ALL	Reset all active alarms
ON CN_x	Activate control <i>x</i> (no PIN)
yyyy ON CN_x	Activate control <i>x</i> (PIN = yyyy)
OFF CN_x	Deactivate control <i>x</i>
yyyy OFF CN_x	Deactivate control <i>x</i> (PIN = yyyy)
PULSE CN_x	Pulse control <i>x</i> for 1 second
yyyy PULSE CN_x	Pulse control <i>x</i> for 1 second (PIN = yyyy)
RESEND REPr,p	Request a copy of report <i>r</i> , the one sent <i>p</i> periods ago. 0 means the most recent. Both numbers are required, with a comma between them and no space. Example: RESEND REP1,0.
GPRS n,email@address.com	Go online for <i>n</i> minutes. The unit sends its current public IP address to the email address given, and by SMS reply. No PIN is needed by default. If a PIN is set, send yyyy GPRS n,email@address.com instead. Spaces matter: one space after GPRS, no space around the comma.

Commands are not case-sensitive. Use a single space between words.

The unit replies to a valid command with this SMS: **Location: OK [command]**

5.9 Power Management

Low Power mode: The unit sleeps when it is not scanning, logging or communicating. It wakes for each scheduled task.

Always-on mode: The unit stays awake all the time. Use this mode where the LAN port must be reachable at all times, for example for continuous remote access. This mode uses more power. It is not recommended for battery or solar installations without enough charging capacity.

To change the mode, go to Change Setup and click **Change Power Settings**. Then select the mode you need.

Change Power Settings

System Power: LOW POWER ☐ ALWAYS ON (default) ☒

Modem Power: ALWAYS ON (default) ☒ CONTROLLED BY SCHEDULE ☐

[Cancel](#) [Save](#)

Modem scheduling: You can schedule the internal modem to power down during set hours. This saves more power. During the off periods, alarm SMS and email still work normally. Only remote access is unavailable.

5.10 About Page

The About page identifies the unit. Quote these details when you contact Halytech support.

Field	Shows
System status	OK, or a fault description
Software version	The software configuration code and version number
Hardware version	Main board version, then I/O board version
Installed options	Any paid software options on this unit, or none
Serial number	The unit serial number
MAC address	The LAN port hardware address
Modem model	The mobile module fitted
Modem firmware	The mobile module software version
Modem IMEI	The mobile module serial number

The page also carries the Halytech contact details and a link to the open source licence texts.

About This System

System status: OK

Software version: [REDACTED]

Hardware version: 1.0 / S02.02

Installed options: none

Serial number: [REDACTED]

MAC address: [REDACTED]

Modem model: TBA

Modem firmware: TBA

Modem IMEI: TBA

Designed and manufactured by:

Halytech

PO Box 6983

Baulkham Hills Business Centre

NSW 2153 Australia

Ph: +612 8814-5235, sales@halytech.com.au

www.halytech.com.au

Note: This product contains software components subject to open source licenses that can be viewed [here](#).
The source code for these components is available by contacting Halytech.

About the example above. The three modem fields read **TBA**. A field reads **TBA** until the unit has powered up its mobile module and read the details from it. Power the unit on with a SIM fitted. Wait for it to connect. Then open the page again. The three fields then show the module fitted, its software version and its IMEI.

The Software version, Serial number and MAC address are hidden in this example. They are different on every unit.

6. Maintenance

6.1 Battery Maintenance

Spider 2 supports 12V sealed lead acid (SLA) batteries up to 10Ah. The unit monitors the battery voltage all the time. The voltage is shown on the display (screen 3) and as a system monitor in the web interface. To get a warning when the voltage drops below a set threshold, set up a low battery alarm on the Battery Voltage monitor.

Checking battery health

Use the battery voltage reading to check the battery condition:

Voltage at rest	Condition
12.6–13.0V	Healthy, fully charged
12.0–12.5V	Partially discharged
Below 11.5V	Discharged or failing — investigate

Measure the resting voltage when the battery is neither charging nor under significant load. Check at dawn before solar charging starts, or 30 minutes after you disconnect the charger.

Battery replacement

SLA batteries typically last 2–5 years, depending on temperature, depth of discharge, and charge cycling. Replace the battery if:

- Resting voltage is consistently low despite adequate charging
- The unit cannot maintain operation through expected no-charge periods (e.g. cloudy days for solar installations)

To replace the battery:

1. If the unit is installed in an enclosure, open the enclosure to reach the battery.
2. Disconnect the charger (mains or solar) first.
3. Disconnect the battery.
4. Fit a 12V SLA battery that suits the installation. The standard replacement is a 12V 7.2Ah SLA from Halytech, or an equivalent up to 10Ah.
5. Check the polarity before you reconnect. Incorrect connection may damage the unit.

6. Reconnect the battery first.

7. Reconnect the charger.

7. Specifications

7.1 Hardware Specifications

Spec	Value
Power input (charger)	16–24V DC, 3A minimum
Battery	12V sealed lead acid, up to 10Ah
Operating temperature	–5 to +50°C
Power consumption	~20mA (low power mode) / ~100mA (always-on mode)
Connectivity	4G LTE Cat 1, Ethernet (LAN), WiFi (IEEE 802.11 b/g/n, hotspot/access point mode)
SIM	Nano SIM (push-release tray)
Bluetooth	Hardware present — not yet supported in software
SD card	Hardware present — not yet supported in software
USB	microUSB, high-speed
Antennas	1× whip (main) + 1× puck (diversity), SMA connectors
Enclosure rating	IP-20

Inputs

Spec	Value
Native inputs	8, printed IN 1 to IN 8, on two 8-pole connectors
Wire size	Up to 1.5mm ²
Analogue resolution	12-bit
Supported analogue types	4–20mA, 0–20mA (120Ω resistor across terminals, supplied). 0–2.5V (native, direct). 0–5V (1kΩ/1kΩ divider, not supplied). 0–10V (3.3kΩ/1kΩ divider, not supplied)
Counter / Utility Meter	Up to 10Hz. Rolls over at 999,999.999
Galvanic isolation	None between inputs or internal circuitry

Controls (Outputs)

Spec	Value
Relay outputs	8 (CN1–CN8), on two 8-way connectors
Contact type	Latching relay
Rating	30V AC or DC / 1A (non-inductive/resistive) — low voltage/low current loads only*
Inductive loads	DC only — fit the supplied flyback diode at the coil. Do not fit a diode on an AC load.

Alarms

Spec	Value
Number of alarms	Up to 16
SMS numbers per alarm	Up to 3
Email addresses per alarm	Up to 2
SMS acknowledge window	0–60 minutes (default 30 minutes)
Email retry	3 attempts at 3-minute intervals

Logger

Spec	Value
Capacity	100,000 records
Storage	Non-volatile eMMC
Time resolution	1 second
Time sync	Automatic via NTP
Download format	CSV

Display and Black Button

Spec	Value
Display	16 character × 2 line alphanumeric LCD with backlight
Button	One black button
Location name	Up to 16 characters

7.2 Physical Specifications

Spec	Value
Dimensions	200mm (H) × 110mm (W) × 90mm (D)
Weight	650g (approx)
Enclosure material	Polymer
IP rating	IP-20
Mounting	Keyhole wall mount — centres 79mm (W) × 178mm (H)
Origin	Designed and manufactured in Australia

For the dimensions drawing, see Section 3.1 Mounting.

8. Appendices

Appendix A — Logged Data Format

Spider 2 stores its logged data in a binary format. Before each download, the unit converts the data to a standard CSV (comma-separated values) file. Most spreadsheet and database programs can open this file.

This appendix describes the **Raw** download format. Each record (row) consists of four fields:

1. Record date — e.g. **14/05/03**
2. Record time — e.g. **12:34:15**
3. Record numeric identifier
4. Record text description — or, for analogue and counter inputs, the value of the input

The numeric identifier shows what the record represents. The table below lists the identifiers in common use. It is not a complete list. A download may hold an identifier that is not in the table. Where an identifier is a formula (e.g. **200 + AL#**), use the values in the decode key below the table.

Numeric identifier	Range	Text	Meaning
32768	32768	New File	New log file created
32769	32769	NORML ST	Normal program start
32770	32770	PHONE ST	Phone program start
32771	32771	MODM ON	Modem came on-line
32772	32772	MODM OFF	Modem went off-line
32773	32773	RING DTC	Incoming ring detected
32776	32776	MODM CFG	Modem configuration loss
32784	32784	NTP OK	NTP — no change needed
32785	32785	NTP +/- x.y	NTP time changed by x.y seconds
32786	32786	NTP NGx	NTP error x
0 + IN#	0–10	Numeric value of analogue / system input	Analogue / system input log record
20 + IN#	20–27	Numeric value of counter input	Counter input log record
50 + 2×IN# + STATE	50–65	STx=y	Digital input change
80 + IN#	80–87	Numeric value of event counter at the time of the event	Event input log record
100 + 2×CNT# + STATE	100–115	CNx=y	Control change
140 + IN#	140–147	Numeric value of event counter at midnight	Event input midnight check (no event occurred)
160 + IN#	160–167	Numeric value of daily rain total at the time of the event	Daily rain input log record
180 + IN#	180–187	Numeric value of daily rain total at midnight	Daily rain input midnight check (no event occurred)
200 + AL#	200–215	Alarm x	Alarm activation
240 + AL#	240–255	Alarm x	Alarm de-activation
280 + AL#	280–295	ALMx ACK	Alarm acknowledgement

Numeric identifier	Range	Text	Meaning
300 + 10×AL# + SEQ	300–459	SMSxy OK	SMS alarm transmission OK
500 + 10×AL# + SEQ	500–659	SMSxy NG	SMS alarm transmission failed
700 + AL#	700–715	SMS ALxK	SMS command — acknowledge an alarm
718	718	SMS ALLK	SMS command — acknowledge all active alarms
719	719	SMS AL?K	SMS command — acknowledge an invalid alarm number
720 + 2×CNT# + STATE	720–735	SMS CxOF / SMS CxON	SMS command — (de)activate a control
758	758	SMS BPIN	SMS command — (de)activate a control — invalid PIN
759	759	SMS C?OF / SMS C?ON	SMS command — (de)activate a control — invalid control number
760	760	SMS GTST	SMS command — get inputs
761	761	SMS GTCN	SMS command — get controls
762	762	SMS HELP	SMS command — get help
763	763	SMS GTSY	SMS command — get system inputs
764	764	SMS GTRP	SMS command — get daily report
797	797	SMS ROK	SMS command acknowledgement sent OK
798	798	SMS RNG	SMS command acknowledgement send failed
799	799	SMS ????	Unknown SMS command
800 + 2×CNT# + STATE	800–815	RMG CxOF / RMG CxON / RMG CxPL	Remote SMS command — (de)activate a control
820 + 2×CNT# + STATE	820–835	RMB CxOF / RMB CxON / RMB CxPL	Remote SMS command — (de)activate a control — outside allowable time
860 + CNT#	860–867	SMS CxPS	SMS command — pulse a control

Numeric identifier	Range	Text	Meaning
880 + IN#	880–887	REV IPx	Valid event log request via SMS
899	899	REV IPNG	Invalid event log request via SMS
900 + IN#	900–907	Numeric value of utility meter input	Utility meter input log record
1000 + 10×AL# + TRY	1000–1153	EMLxz OK	Email sent OK
1200 + 10×AL# + TRY	1200–1353	EMLxz NG	Email sending failed
1300 + TRY	1300–1302	EMREP OK	Automatic email report sent successfully
1310 + TRY	1310–1312	EMREP NG	Automatic email report sending failed
1320 + TRY	1320–1322	FREP OK	Automatic FTP report sent successfully
1330 + TRY	1330–1332	FREP NG	Automatic FTP report sending failed
1999	1999	nnnnnnnnnn	SMS received from telephone number nnnnnnnnnn
2000 + IN#	2000–2007	Scaled value of input (or 0 if no event)	Hydstra rain input log record
2020 + IN#	2020–2027	Numeric value of Hydstra rain counter at midnight	Hydstra rain total record (no event occurred)
10000 + IN#	10000–10027	Number of seconds this input was ON	Recorded immediately after the OFF record

Decode key:

- **IN#** — input number:

Value	Input
0–7	User inputs IN 1 to IN 8
8	Battery charger status
9	Battery voltage (V)
10	System temperature (°C)

- **STATE** — digital input state (0 = OFF, 1 = ON)
 - **CNT#** — control number (0–7, for CN1–CN8)
 - **AL#** — alarm number (0–15)
 - **x** — alarm number (1–16), equals AL# + 1
 - **SEQ** — alarm SMS sequence step (0–10)
 - **y** — alarm SMS sequence number (1–9), equals SEQ + 1
 - **TRY** — email / report sending attempt (0–2)
 - **z** — email / report sending attempt (1–3), equals TRY + 1
-

Appendix B — Input Types at a Glance

Input type	When it logs	Log resolution	Typical use
Switch	On each state change	On change	Float switches, status contacts, pump run time
Analogue	On significant change	Scan period	Level, pressure, temperature, flow
Counter	On significant change	Scan period	Pulse flow meters, any pulse output up to 10 Hz
Event	On each pulse	On pulse	Tipping bucket rain gauge, slow pulse sources
Daily Total	On each pulse. The count clears at midnight	On pulse	Daily rainfall, daily pulse totals
Utility Meter	Every scan period	Scan period	Water, electricity and gas meters
Hydstra Rain	On each pulse	On pulse	Tipping bucket rain gauge, hydrographic software
System monitors	On significant change	Scan period	Battery charger, battery voltage, unit temperature
Disabled	Never	—	An input you are not using

For the scan period and the midnight log, see section 4.5.

Appendix C — SIM Cards and iPhones

If you use an iPhone to disable the SIM PIN before installation, follow these steps carefully. They stop iMessage from taking SMS messages meant for the Spider 2.

The problem: When a SIM is inserted into an iPhone with iMessage enabled, Apple registers that phone number with iMessage. That registration stays after you move the SIM to another device. An SMS sent to that number by another iPhone user then goes to the original iPhone as an iMessage. It never arrives at the Spider 2 as an SMS. Alarm notifications and SMS commands will not arrive at the Spider 2 while this is the case.

How to test it:

Send a text message from an iPhone to the Spider 2 SIM number. Look at the colour of the message bubble.

Bubble colour	Meaning	Result
Green	The message went as SMS	Correct — SMS reaches the Spider 2
Blue	Apple holds the number for iMessage	SMS will not reach the Spider 2

The sender must use an iPhone. An Android phone always sends SMS, so it always shows green, even when Apple holds the number.

How to avoid it:

1. Before you insert the SIM, go to **Settings**, then **Messages** on the iPhone.
2. Turn off **iMessage**.
3. Insert the SIM.
4. Disable the PIN (Settings, then Cellular, then SIM PIN).
5. Remove the SIM from the iPhone.
6. After the SIM is removed, you may turn iMessage back on. It re-registers with your regular iPhone number, not the Spider 2 SIM number.

If iMessage has already been registered to the SIM number:

Apple provides an online tool to deregister a phone number from iMessage. The process may change. Search for "Apple iMessage deregister" to find the current instructions and the link.

Appendix D — If You Cannot Connect

Use this appendix if the Spider 2 WiFi network does not appear, the browser shows an error page, or the login is refused. Check these in order.

- 1. The unit must be awake.** Look at the display. If the backlight is off, press and hold the black button until it turns on. A browser cannot connect to a sleeping unit, by cable or by WiFi.
- 2. On WiFi, the network must be running.** If the Spider 2 network is not in your device's WiFi list, the WiFi has stopped. It times out, and it also stops after a power cycle or sleep. Press and hold the black button to start it again.
- 3. On WiFi, the password must be right.** Retype it from the label on top of the unit. If it still fails, someone has changed it and the label is out of date. Connect by LAN cable. Set a new

password in Change Network Settings, then Wi-Fi Settings. See section 4.10.

4. The address must be right. By cable it is **192.168.0.187**, unless someone has changed it. To see the address the unit is using, press the black button until the display shows it. Over WiFi it is usually **192.168.10.1**, the address at the start of the network name on the display.

5. By cable, give it ten seconds. Wait ten seconds, then reload the page. The laptop and the unit need that time to agree on an address.

6. By cable, the laptop must get its IP address automatically. The Spider 2 acts as a DHCP server. It gives your laptop an address on its own network, so the two can talk without you setting anything. The laptop's Ethernet adapter must be set to obtain an IP address automatically (DHCP). If DHCP is disabled, the laptop keeps its own fixed address and never reaches the unit. This is the usual cause on a laptop set up for a fixed office network.

7. Easy Connect must match how the unit is wired. For a direct PC connection, Easy Connect must be enabled. Where the Spider 2 is on a LAN, it must be disabled. See section 4.10.

8. If the login page opens but refuses you, check the credentials. The factory defaults are **user / changeme** for the administrator and **user / user** for the normal user. If someone has changed them, ask the system owner — see section 4.4.



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Full specifications, downloads and support

www.halytech.com.au/products/spider2

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