



Spider 2 AMR

Quick Start Guide

Models	HAM-050, HAM-051
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Spider 2 AMR Quick Start Guide

Spider 2 AMR is a complete, ready-to-install automatic meter reading base station for water, gas, and electricity meters. It collects readings from wired meters (Halytech RIMs and other Modbus RS-485 devices) and from battery-powered Halytech wireless transmitters (HAM-051 only), and delivers the data automatically by email or FTP.

This guide covers physical installation and first-time configuration on site. For full detail on configuration options, reporting, alarms, and maintenance, refer to the *Spider 2 AMR User Manual* — available at halytech.com.au, under Products, Spider 2 AMR, Downloads.



1. What's in the Box

Item	HAM-050	HAM-051
Spider 2 AMR base station (pre-assembled in IP66 weatherproof enclosure)	✓	✓
12V 7.2Ah SLA battery (pre-installed)	✓	✓
90W mains power supply (pre-installed)	✓	✓
Mobile whip antenna — 4G 5dB, 5m cable, SMA	✓	✓
Mobile puck antenna (diversity) — IP67, 3m cable (pre-mounted on enclosure top)	✓	✓
Enclosure wall bracket (in bag)	✓	✓
Antenna bracket (wall/pole mount)	×1	×2
LAN cable (for initial setup)	✓	✓
Connectors (+ resistors/diodes)	✓	✓
WRX-01 wireless receiver, 433MHz (pre-installed, connected to AUX2)	—	✓
High-gain 433MHz wireless antenna — 3.5m cable, SMA	—	✓

2. Before You Start

Collect the following before attending site:

- Nano SIM card with active data plan, **PIN disabled**, otherwise the SIM is locked
- APN for your SIM card — confirm the correct value with your carrier or SIM provider
- Laptop or tablet for setup — by LAN cable or WiFi, you do not need both. A laptop with an Ethernet adapter is needed only for Easy Connect
- RS-485 daisy-chain cable (CAT-5 or better) — only if RIMs or other Modbus devices are being installed
- List of wireless transmitter addresses (HAM-051 only) — 15-digit code printed on each transmitter label, e.g. 00278-04-03153276
- Site survey complete — meter locations identified; line-of-sight checked for wireless transmitters where applicable (HAM-051)
- FTP server address, username, and password (if automatic FTP reports required)
- SMTP server address, port, and credentials (if automatic email reports required)

3. Mount the Enclosure

1. Fit the supplied wall brackets to the enclosure.
2. Ask a second person to hold the enclosure against the wall in the chosen position.
3. Mark the mounting points on the wall.
4. Fit the wall fixings at the marked points.
5. Mount the base station on the fixings.

Note: The assembled unit weighs approximately 10–15 kg. Ensure the wall surface and fixings are rated for the load.

The enclosure is rated IP66 and is suitable for indoor and outdoor installation.

4. Insert the SIM Card

1. Open the enclosure door.
2. Locate the nano SIM tray on the Spider 2 AMR unit (push-release tray).
3. Insert the nano SIM with the contacts facing the same direction as the LCD, and close the tray.

If you activate the SIM in an iPhone first, turn iMessage off. Otherwise SMS may never reach the unit — see section 14.



5. Connect Mains Power

The 90W mains power supply is pre-installed and wired to the charger input. Connect the mains supply to a suitable power outlet.

If mains power is not available, connect an external solar panel to the charger input in place of the mains supply.

6. Power On

1. Switch on the mains supply (or solar input).
2. The Spider 2 AMR will boot — the LCD will start.
3. If the unit is in low power mode, press the black button to wake it. The LCD will show "**Please Wait...**" — the unit may take up to 30 seconds to wake up.
4. The unit powers from the mains supply and charges the internal SLA battery.

7. Mount the Antennas

All antennas are pre-connected at the factory. Mount them in position only — no cable connections are required on site.

Do this with the unit powered on, so you can read the signal on the LCD.

1. Hold the external antenna where you plan to mount it.
2. Read the signal strength on the LCD.
3. Move the antenna until the signal is good.
4. Mount the external antenna with the supplied bracket.

Caution: Hand-tighten SMA antenna connectors only. Using tools to tighten SMA connectors may damage the connector and void the warranty.

Antenna	Where to mount
Mobile whip (5m cable)	External — mount clear of metalwork for best signal. Use the antenna bracket provided.
Mobile puck (3m cable, pre-mounted)	Already fixed to top of enclosure — leave in place unless relocation is needed.
433MHz wireless antenna (HAM-051 only, 3.5m cable)	External, elevated position with clear line-of-sight to the transmitters. Use the second antenna bracket provided. Avoid mounting directly behind metal surfaces.

Antenna extension cables are available from Halytech if antennas cannot be positioned in a good signal location.

8. Connect Wired Meters and Sensors

For meters and sensors close enough to the base station to be wired directly (no separate RIM needed), use the eight native inputs, printed **IN 1** to **IN 8** on the case. Two 8-pole screw-terminal connectors, two terminals per input, max wire size 1.5 mm².

Connect each meter or sensor to the relevant input terminals. Configure the input type, set a name, and calibrate as required in section 12.

Note: There is no galvanic isolation between inputs or to internal circuitry. Ensure field wiring is appropriately isolated.

9. Connect RIMs and Modbus Devices to AUX1

For meters in other locations, use Halytech RIMs or other Modbus RS-485 devices, daisy-chained to the base station's AUX1 port.

AUX1 pinout:

Pin	Function
1	12V Output — local sensor power only, do NOT route along the bus
2	RS-485 D+
3	RS-485 D–
4	Ground

Bus rules:

- Daisy-chain only — no star/branches
- Max 1000 m (CAT-5 or better twisted-pair)
- Unique address per RIM (rotary switch 1 to F)
- 120 Ω terminator jumper on the last RIM
- Supplied pigtail terminator fitted at the base station AUX1 end
- Run only D+, D–, and Ground along the bus

Caution: A short to ground on Pin 1 may damage the base station.

Gas meters: Confirm local authority and hazardous-area requirements before connecting.

For RIM mounting and meter wiring, see the *RIM Installation Guide*.

10. Install Wireless Transmitters (HAM-051 only)

Bench test one transmitter first. Set a transmitter up next to the base station and get it reading there, before you go out to the meters. It proves the receiver, the address, the checksum and the input type in one go, with no radio problem in the way. If it works on the bench and fails at the meter, the fault is the radio path.

Mount each Halytech wireless transmitter at its meter location. Record the 15-digit address from the transmitter label — you need it for configuration in section 12.

The base station runs the radio. It polls each transmitter in turn and sets the path through any repeaters. Transmitters do not talk on their own. So every signal check is done at the base station, not at the meter.

Range (clear line of sight):

Link	Range	High-rise (vertical)
Base station to transmitter	up to 450 m	4 floors
Base station to high-gain repeater	up to 600 m	5 floors
High-gain repeater to transmitter	up to 450 m	4 floors
Transmitter acting as a repeater	about 300 m	3 floors

What cuts the range. Metal, earth banks and hills, plant foliage, and reinforced concrete all cut it a lot. Brick and dry wood cut it a little.

If a transmitter is too far away or behind an obstruction, add a repeater.

- Another transmitter can act as a repeater, reaching about 300 m.
- A high-gain repeater reaches further, up to 600 m from the base station. Use one for the long legs.
- Up to 3 repeaters may sit in a chain between the base station and any one transmitter.
- One repeater can serve any number of transmitters, and a site can have any number of repeaters.
- Check the signal on each hop separately. A chain is only as good as its weakest leg.

If two or more base stations are within radio range of each other, set each one to a different RF zone in Change Input Setup. This stops them interfering.

Signal strength, read in Wireless Transmitter Diagnostics:

Signal	What to do
50% or more	Good. Leave it
40% to 50%	Acceptable
30% to 40%	Low. Move the transmitter or the 433MHz antenna, or add a repeater
Below 30%	Unreliable. Do not leave it in service

Aim for 50% or more at install. Transmitters work down to about 30%, and below that readings are lost.

Gas meters: Confirm local authority and hazardous-area requirements before installing on a gas meter.

Section 12 covers transmitter setup. Section 13 covers the final signal check.

11. Connect to the Web Interface

First, wake the unit. If the LCD 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 **LAN** port on the Spider 2 AMR.
2. Open a browser and go to **192.168.0.189** in the address bar. The unit also shows its own address on the LCD — press the black button until you see it.

The login page should open. If the browser shows an error page instead, see section 14.

Option B — WiFi

1. Press the black button briefly until the LCD shows the WiFi screen. It reads **Wi-Fi STATUS**, then **Enabled** with a countdown of the time the WiFi has left.

2. On your laptop or tablet, open its WiFi settings. Look for a network named **192.168.10.1_Spider2_[serial]**, where the serial is the unit's serial number. The factory-set password is printed on the label on top of the unit.
3. Open a browser and go to **192.168.10.1** in the address bar. It is the address at the start of the network name.

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

The login page should open. If the network does not appear in your WiFi list, if the password is rejected, or if the browser shows an error page, see section 14.

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

Default login credentials:

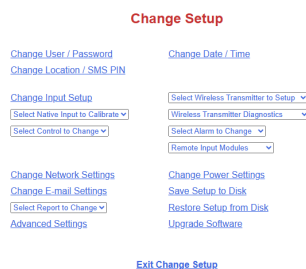
Role	Username	Password
Administrator	user	changeme
Normal user	user	user

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

12. Initial Configuration

All configuration is done via **CHANGE SETUP** in the web interface. Work through the following in order:

Change Setup stops logging and alarms. Exit as soon as you finish.



a. Change password

Navigate to **Change User / Password**. Set a new administrator password and record it securely.

b. Set location name

Navigate to **Change Location / SMS PIN**. Enter a unique name for this installation (up to 16 characters). This name appears at the start of all SMS and email notifications.

c. Set date and time

Navigate to **Change Date/Time**. Confirm or correct the date and time, and set the correct timezone for the installation location.

d. Configure mobile network (APN)

Navigate to **Change Network Settings**. Enter the carrier APN for the installed SIM.

e. Configure native inputs

Navigate to **Change Input Setup**. For each active input:

- Set the **input type** (Switch, Counter, Analogue, Utility Meter, etc.)
- Enter a descriptive **input name**
- Set logging interval and units as required

Unused inputs should be set to **Disabled**.

For analogue inputs: calibrate using **Select Native Input to Calibrate or Scale** before going live. For counter / utility meter inputs: set the pulse scaler and, if required, pre-set the counter to match the current meter reading.

f. Configure RIMs and Modbus devices

Choosing the meter input type. Two types read a meter, and they record different numbers:

Type	What it records
Utility Meter	Consumption during each logging period, for example 0.115 kL. It also logs one meter reading per day
Counter	A running total that matches the number on the meter itself

Ask the customer which their billing system needs before you set the type.

Utility Meter logs two values at midnight. One is the consumption, under the input name. The other is the meter reading, under the same name with **_reading** added. An input named **Main Meter** gives **Main Meter** and **Main Meter_reading**. Tell the customer, so the second row does not look like a fault.

For each RIM installed in section 9, follow the *RIM Installation Guide* to add it via the web interface and configure its inputs.

g. Set up wireless inputs (HAM-051 only)

1. In **Change Input Setup**, set the number of wireless transmitter modules to match the number of transmitters at this site.
2. Navigate to **Select Wireless Transmitter to Setup**.
3. For each transmitter, enter its address (format **00000-00-00000000**, printed on the transmitter label) and configure the input type and name.
4. The label ends in a 3-digit checksum after a dash, for example **...-123**. The web interface shows the same checksum after you enter the address. Check the two match. If they differ, the address has a typing error. The checksum is not on the LCD.

Wireless Transmitter 1 Setup

Transmitter location:
Transmitter type:
WaveFlow options: ☐ Tamper Connected ☐ External Calibration
Transmitter address: (Checksum: 198)
Number of repeaters:

Input Number	Type	Name	Units	Alternate ID
1	Counter	RecyWaterMeter	kl	EL22123M

[Cancel](#)

5. Open **Wireless Transmitter Diagnostics** in the base station web interface and check each transmitter reads 50% or more. Move a transmitter and check again before you fix its mounting.
6. To refresh the readings, click **Update Display** on the Wireless Inputs page.

7. Log one reading every 12 hours. This is the recommended setting. It gives the longest transmitter battery life.

h. Multiple Wireless Base Stations (HAM-051 only)

If two or more Spider 2 AMR units are within wireless range of each other, set each to a different RF zone. This will minimise possible interference

13. Verify and Hand Over

Before leaving site, confirm the following:

- Mobile signal 40% or better on the LCD. Below 40% reposition the antenna
- Date and time correct
- All active inputs showing expected readings in the web interface
- Each RIM refresh — readings presented on the RIM Inputs page, providing there are no Modbus comms errors
- All wireless transmitters reading 50% or more (HAM-051 only)
- Where repeaters are in use, each hop checked separately (HAM-051 only)
- Password changed from factory default
- Location name set
- APN configured and data connection active

14. Troubleshooting

Connecting and mobile

Symptom	Likely cause	Action
Browser shows an error page, not the login page	Unit asleep, or browser opened too soon after plugging the cable in	Press and hold the black button until the backlight turns on. Then wait ten seconds and reload the page
Can't reach 192.168.0.189 in browser	DHCP not enabled on the laptop adapter, or the unit is on a LAN with a different address	Enable DHCP on your Ethernet adapter. Press the black button until the LCD shows the address the unit is using
WiFi network not showing on device	WiFi not activated, or timed out	Hold the black button again — WiFi must be reactivated each session
WiFi password rejected	Mistyped, or changed from the factory setting	Retype it from the label. If it still fails, connect by LAN cable and set a new one in Change Network Settings
No signal strength shown (?? or —)	No antenna fitted, antenna loose at the SMA connector, SIM not seated in its tray, or SIM not activated	Check an antenna is fitted to Main and is hand-tight. Reseat the SIM in its tray. Confirm the carrier has activated the SIM
SMS from an iPhone never arrives	The SIM was activated in an iPhone with iMessage on, so Apple holds the number	On that iPhone, open Settings, then Messages and turn iMessage off. To test, text the unit from an iPhone — green means SMS, blue means Apple still holds it. Apple has an online tool to deregister a number
Mobile registration failed	Incorrect APN, antenna fault, or SIM not activated	Verify APN matches your carrier; check antenna; confirm SIM is activated
Signal present but SMS not received	SIM plan does not include SMS	Contact carrier to enable SMS on the SIM
Signal present but email not delivered	APN, SMTP, or address configuration error	Confirm APN is correct; check SMTP server and email address settings
Forgotten login password	Default is user / changeme (admin) or user / user (normal user)	If defaults have been changed, contact the system owner — passwords should be on record

RIMs on the RS-485 bus

Symptom	Likely cause	Action
A RIM does not appear, or shows Modbus comms errors	Two RIMs share an address, the terminator jumper is missing or on the wrong RIM, or the cable is branched instead of daisy-chained	Give each RIM its own address, 1 to 15, on its rotary switch. Fit the 120Ω terminator jumper on the last RIM only. Rewire as one chain — a star layout does not work on RS-485
Readings drop out along the chain	Total cable run over 1000 m, or D+ and D– swapped at one RIM	Measure the run. Check D+ and D– at each RIM
RIM blue LED not flashing	No 18–24V DC supply. Each RIM needs its own	Check the supply at that RIM. A healthy RIM flashes about once every 5 seconds
RIM blue LED flashing about once every 2 seconds	The RIM's backup battery is flat	Replace or recharge the 12V 7.2Ah battery. A good battery carries the RIM for at least a week without mains
No RIMs respond at all	The pigtail terminator is not fitted at the base station	The RS-485 run must start at the base station AUX1 port with the supplied pigtail terminator fitted
No RIMs respond, or the base station is damaged	AUX1 Pin 1 wired into the CAT-5 run	AUX1 Pin 1 is +12V. Never run it along the bus. The RIM's own Pin 1 is Ground, so the two connectors are not wired the same
A RIM part way along the chain drops out	Only one cable in its RS-485 connector	Every RIM except the last has two CAT-5 cables in its RS-485 connector. The last has one
Meters 17 to 32 do not read	RIM is in 16-input mode, which uses those pins for tamper detection	32-input mode reuses the tamper pins as meter inputs. Set the mode to match how the meters are wired
False or extra pulses	Meter cable run beside electrical cabling or near a motor, or the cable shield connected at both ends	Reroute the meter cable away from electrical wiring and noise sources. Connect the shield at the RIM end only, never at the meter

Wireless transmitters

Symptom	Likely cause	Action
No response from a transmitter or a repeater	Address typed wrong, or the unit named in the message is out of range or blocked by metal, reinforced concrete, foliage or a hill	The message names the transmitter or the repeater at fault. Check the 3-digit checksum in the web interface matches the label. If it does not, the address is wrong. If it does, check that hop in Wireless Transmitter Diagnostics — move the unit or its antenna, or add a repeater
Signal below 50%	Path is marginal or blocked	Move the transmitter or the 433MHz antenna, or add a repeater. Below 30% is unreliable — do not leave it in service
Recent readings missing from a history download	Transmitters hold 24 records and are polled only when needed	Not a fault. Click Update Display first. Automatic reports are always complete
Signal good on one hop, readings still missing	A later hop in the repeater chain is weak	Check each hop separately. A chain is only as good as its weakest leg
Readings stop after another base station is installed nearby	Both base stations on the same RF zone	Set each base station to a different RF zone in Change Input Setup



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