

Non-urban Water Metering



Installation Guide



Revision History

<i>Document Version</i>	<i>Release Date</i>	<i>Comments</i>
V3	Dec 2020	Additional information
V2	Oct 2020	meterwatch version
V1	Dec 2019	Initial Release

This user manual is for the Halytech meterwatch version only.

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Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Warning

This device contains lithium batteries. Incorrect use or handling of batteries may result in fire or explosion. Please refer to Appendix C for correct battery handling procedures.



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Introduction

The Halytech microSpider meterwatch is designed specifically for irrigation monitoring and reporting.



System Overview

meterwatch is preconfigured for use with a single pulse water meter. It continuously monitors the water meter and tamper circuits. It sends periodic reports and real-time alarms to a centrally managed government website.

meterwatch is weatherproof, has an integrated long-life battery pack and communicates via the mobile telephone network.

Connection to the water meter can be made with a flying lead or with a connector.

The meterwatch Ordering Matrix on the next page describes different meterwatch configurations in more detail.

Regulations

You must be a **duly qualified person** as defined by government to install any instrumentation for this application.

meterwatch Ordering Matrix

meterwatch Variant	Pulse Probe Unit Option	Additional Pulse Probe Unit Parts	Other Additional Parts	Security
HMW-003 External antenna Pulse Probe Connector	Halytech supplied and terminated meter pulse unit	None	<ul style="list-style-type: none"> • External antenna with SMA connector Examples: Halytech HAN-001 Benelec 024585 Benelec 024574S 	A tamper evident seal issued by Irrigation Australia
	Make your own	Suitable Pulse Probe		
HMW-002 External antenna Flying Lead	Make your own	Suitable Pulse Probe	<ul style="list-style-type: none"> • HHS-013 LANlink cable (one per installer) • RMT-025 Optional pipe mounting kit 	

ORDERING CHECKLIST: In addition to the chosen meterwatch variant, you need to purchase items from each shaded column.

Preparation

Things you should consider before going on site include:

- **Mobile Signal:** If Telstra mobile phone reception is poor in the area, plan ahead for this. You may need to install antenna in a raised location (consider pole mounting) and/or purchase a higher gain external antenna.
- **Mounting:** If there are no suitable flat vertical surfaces make sure you order the optional pole/pipe mounting kit.
- **Ordering:** In addition to the chosen meterwatch variant, Halytech requires specific site information, including – site name, meter model, meterSiteID, and meterID. (The two IDs are provided to you during site registration on the DQP Portal.)
- **Pulse probe unit:** There are three options:
For meterwatch variant with connector you can either purchase the complete Halytech pulse probe unit or make your own. If purchasing the pulse probe unit from Halytech, please specify the required cable length and the water meter model.

For meterwatch variant with a flying lead you need to source the appropriate pulse probe and join it to the meterwatch flying lead.

Pulse probe preparation

Option 1 - Pulse Probe Unit with Connector - Halytech Supplied

No preparation or additional parts are necessary

Option 2 - Pulse Probe Unit with Connector - Make Your Own

If you know the required cable length, you can terminate the meter pulse probe in your workshop before going on site.

You will need to source a pulse probe compatible with the relevant water meter.
The meterwatch connector is supplied with meterwatch

Please refer to the section “Connecting to Water Meter” later in this document for instructions

Option 3 - Pulse Probe Unit with Flying Lead - Make Your Own

You will need to source a pulse probe compatible with the relevant water meter.
The meterwatch flying lead will be connected to the pulse probe lead onsite.

Please refer to “Connecting to Water Meter” later in this document for instructions

Site Installation

What You Will Need on Site

- meterwatch
- tamper seals
- LANlink Cable – a single cable is required for installation only
- Mounting brackets, hardware and tools
- Pulse probe unit*
- Laptop with a LAN port and a USB port
- Mobile phone with camera

*If you are terminating the cable on site you will need appropriate tools and joining accessories.

Checking Mobile Telephone Signal Strength

It is recommended to check and optimise the signal strength before permanently mounting meterwatch.

Log into the unit and click the “Test Mobile Signal” as described in the section “Configuring meterwatch” later in this document.

You need to attempt to correct poor or no signal conditions. While doing the mobile signal test, try repositioning the antenna and changing its orientation until you get a good signal.

It is important to wait approximately 15 seconds after making each antenna orientation adjustment, as the indicated signal strength does not change instantaneously.

Mount the antenna in the position that gives you the best signal.

Mounting meterwatch

Once you are happy with the signal, mount the unit.

meterwatch can be mounted onto any flat surface through its integrated wall mounting points.

If there are no suitable flat surfaces you can use the optional pipe mounting bracket to mount meterwatch on vertical or horizontal pipes, poles or the meter itself, as shown in the images below. The mounting bracket should be used with appropriate stainless-steel cable ties or hose clips.

Don't forget you will need to fit the tamper bracket later.



Connecting to Water Meter

meterwatch Units With Input Connector

Connector Termination

Please skip this section if you purchased the Halytech supplied pulse probe unit.


You will need to source a pulse probe compatible with the relevant water meter. The meterwatch connector is supplied with meterwatch

Using a fine tipped soldering iron, solder the wires to the appropriate pins on the supplied 8 pin meterwatch connector as per the table below.

You may need to refer to the documentation provided with the pulse probe to identify the relevant signals.

Use heat shrink over soldered joints to reduce the risk of shorts occurring in the connector.

Pin	meterwatch	Meter Pulse Probe Signal
1	Meter Input	Pulse output (+)
2	Do Not Use	
3	Ground	Pulse Common/Ground (-)
4	Tamper Input	Tamper output (+)
5	Do Not Use	
6	Ground	Tamper Common/Ground (-)
7	Do Not Use	
8	Do Not Use	



NOTE: all of the Ground pins are referenced to a common ground.

Running Pulse Probe Unit Cabling

Run pulse probe unit cable from the meter to the meterwatch unit. Use stainless cable ties to keep the cable in place or run the cable in a conduit. The connector fits through a 25mm conduit.

Pass the connector through the stainless-steel tamper bracket as shown here.

(The tamper bracket will be fitted to meterwatch later.)



Plug the connector into the microSpider input (the one with no red ring) and tighten the ¼ turn locking nut.

meterwatch Units With Flying Lead

Run the pulse probe cable from the meter to meterwatch. Use stainless cable ties to keep the cable in place or run the cable in a conduit.

IMPORTANT: Ensure that you run the cable through the stainless-steel tamper bracket before doing your termination as shown here.

If soldering cables, ensure that you use heat shrink on each internal wire as well as on the outside sheath. If using another termination method, ensure the final connections are well insulated so there are no shorts.

It is important that resulting connection has no shorts and that the cable and the connections are weatherproof. Use small sealed junction boxes, self-amalgamating tape or adhesive filled heat shrink.

Poor termination practices will result in unreliable operation of the system.

The following table lists the flying lead colours and the corresponding pulse probe cable connections. You may need to refer to the documentation provided with the pulse probe to identify the relevant signals.

meterwatch flying lead	Meter pulse probe cable signals
Red	Pulse
Green	Pulse Ground
Yellow	Tamper +
Blue	Ground/ Tamper -



Fitting External Antennas

Secure the antenna in the location and orientation that give you the best signal.

Run the antenna cable to the unit. Use stainless cable ties to keep the cable in place or run the cable in conduit. Run the antenna cable through the stainless-steel tamper bracket as shown here.

(The bracket will be fitted to meterwatch later.)

Connect the SMA connector to meterwatch and use self-amalgamating tape around the antenna connection to provide additional protection. Use the tape on any intermediate connections to improve long term reliability.



Configuring meterwatch

meterwatch units are shipped preconfigured for the site and meter so that they are easy to get up and going.

Once you have mounted the meterwatch unit (and the optional antenna) and connected it to the meter you are ready to configure it.

Log in

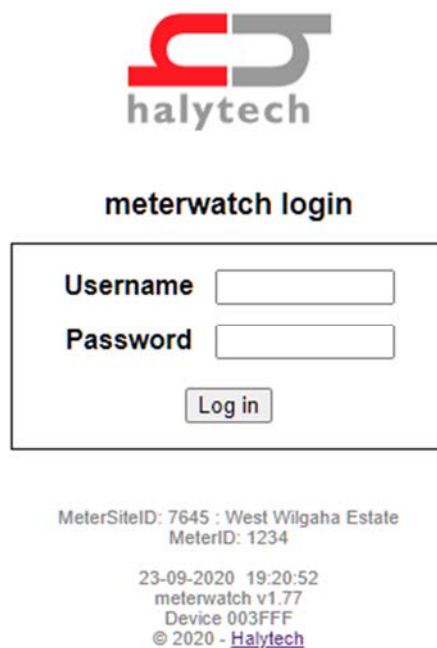
Plug the Lanlink Cable into the connector with the red ring

Plug the LAN and USB connectors into your computer

Using Google Chrome, type in 192.168.0.177 into the address bar:



The log in page will appear:

A screenshot of the meterwatch login page. At the top is the Halytech logo, which consists of a stylized 'H' in red and grey above the word 'halytech'. Below the logo is the text 'meterwatch login'. Underneath is a login form with two input fields: 'Username' and 'Password', each with a corresponding text box. Below the fields is a 'Log in' button. At the bottom of the page, there is a block of text providing site and device information: 'MeterSiteID: 7645 : West Wilgaha Estate', 'MeterID: 1234', '23-09-2020 19:20:52', 'meterwatch v1.77', 'Device 003FFF', and '© 2020 - Halytech'.

Log in using the supplied username and password

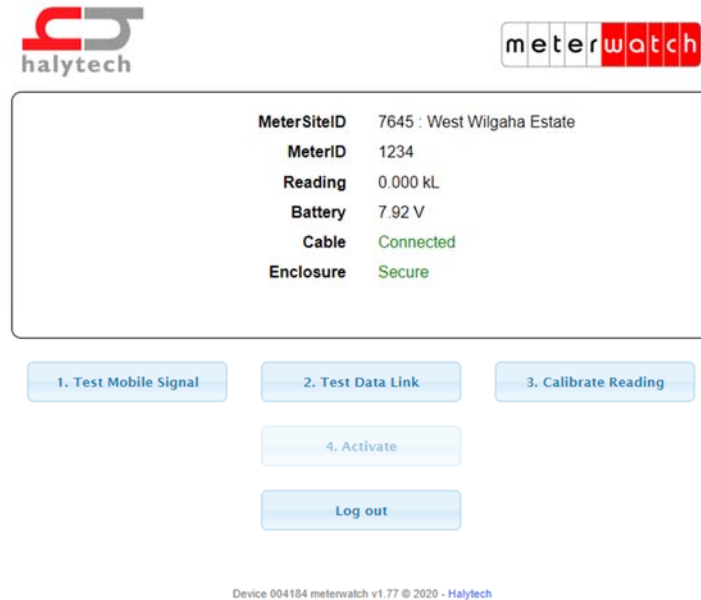
If successful, the main page will appear.

If you forgot the username or password contact Halytech

Activation Process

Prior to starting the activation process, please ensure the following is displayed:

- Battery is above 7.2V
- Cable is “Connected” and shown in green
- Enclosure is “Secure” and shown in green



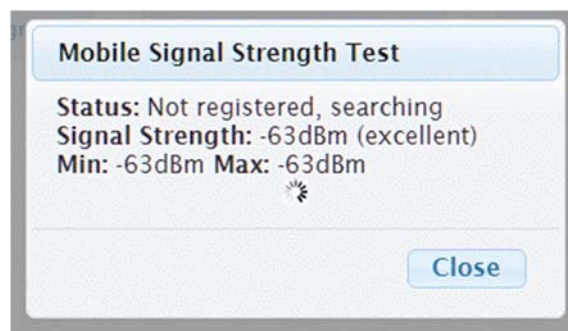
Activation is a four step process.

1. Test Mobile Signal

Test the mobile signal strength and if necessary adjust the antenna location and/or orientation. The mobile signal test will run for around 2 minutes, so you have time to make antenna adjustments.

It is important to wait approximately 15 seconds after making an antenna or meterwatch orientation adjustment, as the indicated signal strength does not change instantaneously.

The signal is shown in dBm with a message describing signal quality - poor, good or excellent. Ideally you should be aiming to get at least a good signal ie -93 dBm or better. *The closer the dBm value is to 0, the better the signal.*



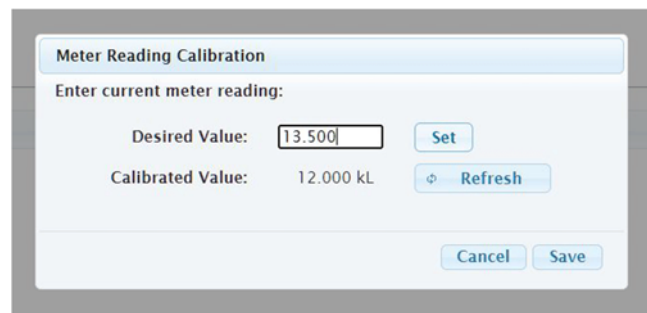
2. Test Data Link

Test Data link checks the meterwatch internet connection by accessing a time server. A successful test also updates the system time.



3. Calibrate Reading

Calibrate Reading allows you to synchronise the reading in meterwatch with the actual meter reading.



Enter the value shown on the meter dial into the desired reading and click Set. If the meter is turning, we suggest you enter a value slightly higher than the meter reading and click set when the meter reading reaches this value.

Run water through the meter and verify that meterwatch tracks the meter reading.

When you are satisfied that meterwatch is tracking correctly click Save

4. Activate meterwatch

Activation is possible only if all 3 steps above are successful, the enclosure is secure AND the meter cable is connected.

Once activated, meterwatch will commence logging and reporting to the central site.

The screenshot displays the meterwatch interface. At the top left is the Halytech logo, and at the top right is the 'meterwatch' logo. The central area contains a white box with the following data:

MeterSiteID	7645 : West Wilgaha Estate
MeterID	1234
Reading	0.000 kL
Battery	7.92 V
Cable	Connected
Enclosure	Secure

Below the data box, the date and time are shown: **Date:** 25/09/2020 and **Time:** 15:25:25. A note below the time indicates 'Local time (no daylight saving)'. Below the data box are five blue buttons: 'Test Mobile Signal', 'Test Data Link', 'Calibrate Reading', 'Save History', and 'Log out'. At the bottom of the interface, the text 'Unit is activated' is displayed, followed by the footer 'Device 004184 meterwatch v1.77 © 2020 - Halytech'.

Final steps

You will probably want to log in one last time to check everything is OK.

The main page allows you to

- verify that the enclosure and cable are connected and secure
- ensure meterwatch is tracking the meter reading.
- test the mobile signal
- test the data link

You need to secure meterwatch before leaving the site by fitting the following, as per the images below:

1. sealing cap on comms connector
(lock by turning a quarter turn)
2. stainless- steel tamper bracket
(secured with two stainless steel nuts)
3. tamper-detect seals
(thread through holes in lid mounting screws after fitting the nuts in step 2.)



Ensure that you record the meterwatch serial number and the tamper-detect seal numbers.
Take photos for future reference

Appendix A – meterwatch Configuration

Time zone – Eastern Standard Time

Time synchronisation - NTP enabled

Local connection IP address - 192.168.0.177

Logging period – 1 hour

Reporting frequency – Daily

Report offset time – as specified by Water NSW

Report destination – as specified by Water NSW

Logged Channels:

- Meter Reading
- Cable Cut
- Enclosure Tamper
- Battery voltage

Other logged information:

- Signal strength

Alarms:

- Cable Cut/Tamper
- Enclosure Tamper
- Low Battery

Appendix B – Support Information

Halytech Contact Details

Email: support@halytech.com.au

Phone: 02 8814 5235

Maintenance Requirements

No routine maintenance is required.

Appendix C – Battery Handling Information

Halytech microSpider meterwatch is powered by non-rechargeable lithium batteries.

Incorrect use or mishandling of batteries may result in fire or explosion.

Battery contents are flammable, corrosive and extremely irritating to the lungs and respiratory system. Lithium metal and thionyl chloride cause chemical burns on contact with skin

Please follow the guidelines below to ensure safe battery operation:

- Do not short-circuit
- Protect wiring from damage
- Do not attempt to recharge
- Do not open, crush, deform or try to disassemble
- Do not expose to water
- Do not solder anything to battery
- Do not incinerate
- Do not leave discharged batteries in a meterwatch
- Do not drop batteries or subject them to mechanical shocks
- Spare batteries are supplied in individual packing containers. Keep the containers and place used batteries in them
- To recycle batteries, please visit <http://recyclingnearyou.com.au/batteries> (meterwatch uses lithium-thionyl chloride Li-SOCl₂ batteries)
- Lithium batteries (fully charged or used up) are classed as “Dangerous Goods” for transportation purposes. You must declare them as such when shipping.

Appendix D – Halytech meterwatch Manufacturer Warranty

Terms & Conditions

1. Halytech warrants that, during the Warranty Period, meterwatch (excluding antennas, meter probes and 3rd party accessories) will, with normal use and service, be free from faulty parts, manufacture or workmanship.
2. The Warranty Period for:
 - a) the meterwatch unit is 7 years from the date of purchase;
 - b) the meterwatch battery is 7 years or 7,000 transmissions whichever occurs first, subject to the clauses below;
3. This warranty is valid only for meterwatch units that are purchased new in Australia;
4. This warranty only applies where a defect has arisen, wholly or substantially, as a result of faulty manufacture, parts or workmanship during the Warranty Period;
5. The warranty does not apply where damage is caused by other factors, including without limitation:
 - a) normal wear and tear;
 - b) abuse, mishandling, accident or failure to follow operating instructions;
 - c) non-removal of consumed batteries resulting in leaking batteries;
 - d) exposure to corrosive liquid;
 - e) servicing or modification of the meterwatch unit by non-authorized personnel;
 - f) shipment or other transit;
6. This Warranty is void in the event of:
 - a) The device being installed by anyone other than a duly qualified person as defined by NSW non-urban water metering framework and/or by not following Halytech installation procedures;
 - b) tampering or modification of the meterwatch unit;
 - c) Connection of non-compatible meter probes or antennas;
7. This warranty does not cover the repair or replacement of anything damaged during transit to or from Halytech;
8. Battery Life has been calculated on following basis:
 - a) Reports sent once per day;
 - b) Average signal strength of better than -97dBm;
 - c) Report size less than 50 kB;
 - d) Device has been installed and commissioned in accordance with Halytech installation procedures, by a duly qualified person as defined by NSW non-urban water metering framework;
9. Except to the extent the law provides that liability is not able to be excluded, Halytech excludes all liability in respect of the Product for any other loss from a failure of this Product, which may include liability for negligence; Halytech shall not be under any liability to the Customer in respect of any loss or damage (including consequential or indirect loss or damage or loss of profits, loss of use or loss of data) however caused, which may be suffered or incurred or which may arise directly or indirectly in respect of Products supplied by Halytech;

10. Halytech is not liable for any other warranty or representations made by 3rd parties;
11. The customer is responsible for returning the products to Halytech for repair or replacement at their own cost;
12. If a warranty claim is not accepted:
 - a) Halytech will inform the Customer;
 - b) if requested to do so by the Customer, Halytech will repair the Product provided the customer pays the usual charges for such repair;
 - c) if applicable the Customer will be responsible for all costs associated with collection of the Product from Halytech.

Issued Dec 2020