

NOVEMBER 2021



# **YDOC LID**

## **BASE TYPING DOCUMENT**

# **INSTALLATION MANUAL**

## **YDOC (Firmware V4.2 B5)**

# 1. LIMITATIONS

Pacific Data Systems Australia accepts no liability for flat batteries, environmental damage, damage due to incorrect installation, site costs, third party equipment including all water meters, unauthorised modifications.

# 2. WARRANTY

Warranty – YDOC Hardware is warranted for 3 years against defective materials and workmanship. Warranty becomes void if damage is caused by an external source (e.g. Lightning or damage caused by connected meter), applying excessive force or water ingress.

All other hardware components come with a 12-month warranty.

The batteries supplied with the YDOC are 2x 3.6 V Primary lithium-thionyl chloride (Li-SOCl<sub>2</sub>) High power D-size spiral cell(s). Estimated battery life of the specified program for logging Modbus or pulse output from water meters is ten years. PDSA does not guarantee any minimum performance period of batteries. DQP's are encouraged to fit new batteries to the YDOC upon installation and carry spares to fit in the event batteries have lost capacity through the process of bench testing by DQP's. The YDOC lid has the capacity for a third battery which can be fitted by DQPs. Battery voltage is to be tested upon installation using the YDOC terminal program (covered in this manual). PDS offers battery pricing, please contact for further details.

Warranty Void - The warranty in is void in the event of: (a) tampering with or modification of the Device; (b) incorrect installation of the Device or externally connected accessories such as sensors, instruments and external antennas or installation by anyone other than a Certified Installer;

Full warranty terms and conditions are provided with quotations.

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## 3. INTRODUCTION

A new non-urban metering framework commenced in New South Wales on the 1st December 2018.

The new metering framework is legislated in the following documents:

- NSW Non-Urban Water Metering Policy (the policy),
- Water Management (General) Regulation 2018 (the regulation),
- The data logging and telemetry specification 2019, and
- Water Management Act 2000 (the Act).

Water users with the following works require a telemetry-capable LID data-logger by the relevant rollout date:

- All surface works – except pumps less than 100 mm as authorised by the approval (unless they meet the multiple works threshold)
- All groundwater works – except bores less than 200 mm (unless they meet the multiple works threshold)
- All groundwater works in high risk groundwater surfaces

This manual provides detailed installation and configuration instructions for the Duly Qualified Person (DQP) on the configuration of the following Local Intelligence Device (LID) approved for connection to patent approved water meters in NSW under the *Data Logging and Telemetry Specifications 2019*:

- YDOC, manufactured by Pacific Data Systems Australia





Figure 1a - PDS-YD-NSW YDOC LID



Figure 1b - PDS-YD-NSW-E YDOC LID

## 3.1 DEFINITIONS

**DQP:** Duly Qualified Person.

**LID:** Local Intelligence Device – a collective description to refer to equipment to measure, locally store and transmit Logged Data to the DAS.

**DAS:** Data Acquisition System, the web platform used by government to collect, store and make available consumption data transmitted by LID.

**DPIE:** Department Planning Industry and Environment.

## 4. BASE TYPING INFORMATION

The following Pacific Data System Australia LID's are approved for use by DQPs under the *Data Logging and Telemetry Specifications 2019*:

- PDS-YD-NSW YDOC LID with integrated antenna (*Figure 1a*)
- PDS-YD-NSW-E YDOC LID with external antenna option (*Figure 1b*)

The YDOC supports the following Meters:

- Krohne Waterflux 3070
- Siemens MAG8000
- Arad Octave DN50
- ABB AquaMaster 3 FEV2
- Aquamonix/Pentair I500
- Sensus WP-Dynamic
- Euromag MUT 2200 EL
- Rubicon Sonaray Pipe Meter
- ABB AquaMaster4
- Other supported non-urban water meters will be included in this list

## 5. INSTALLATION

### Ensure you have the following items:

- YDOC LID
- USB to USB Mini lead
- Pole mounting kit if required to suit 50 to 60mm OD pole
- Sensor cable
- External Antenna and Bracket (PDS-YD-NSW-E Option Only)
- Water Meter Equipment - DQPs are responsible for wiring the data cable to the water meter – please ensure you have any required equipment or documentation
- Spare fuse kit
- Cable ties / Conduit saddles
- Conduit or suitable cable protection
- Tamper Driver Bit for YDOC Screw Heads
- NSW Government issued tamper evident seals (Supplied by Irrigation Australia)
- A fully charged Windows Laptop with available USB port and the YDOC terminal program installed. The YDOC terminal setup can be downloaded at <http://www.ydoc.biz/datalogger-utilities.html>

### You will need general tools including the following:

- PPE
- Adjustable spanner
- Set of screwdrivers
- Spirit level
- Cordless drill bit to suit hose clamp
- Tamper driver bit
- Cordless Drill

## SAFETY NOTICES

We recommend installing a fence around the system and protection for the exposed cables and connectors if there is a chance of damage from animals.

The lithium batteries used in this LID is a Specialised Lithium Battery Cylindrical Cell – Spiral Wound Type. These non-rechargeable batteries are capable of high current discharge rates and contain an internal fuse. Special care must be taken with this battery.

- If the positive and negative sides of this battery are shorted together, the internal fuse will blow, rendering the battery unusable.
- Do not attempt to charge this battery.
- Recommended battery storage at room temperature (30°C maximum), in a dry and ventilated area. Elevated storage temperatures can result in shortened battery life.
- Disposal must be in accordance with local regulations and laws. The battery should never be incinerated or ruptured.

## SURVEY AND PREPARE THE SITE

- Select an open, level site well away from overhead power lines, other amenities, structures and trees which may reduce signal level.
- Select location which has reliable 4G LTE Cat-M1 signal.  
*\*DQP's are to confirm 4G LTE connectivity during initial site survey prior to installation.*
- Select location which does not flood or receive damage by livestock.
- Select a suitable post or structure to mount the YDOC.

## WIRING AND MOUNTING

The YDOC will be supplied with the selected cable with the following bare wires as shown in Figure 2. Figure 3 shows the cable wiring.

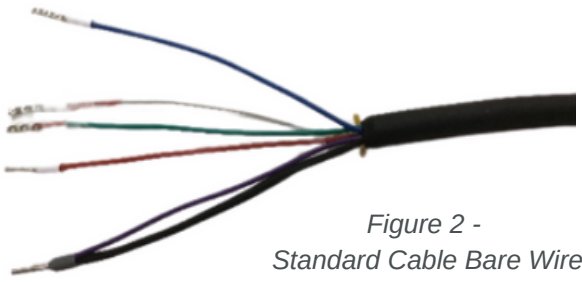
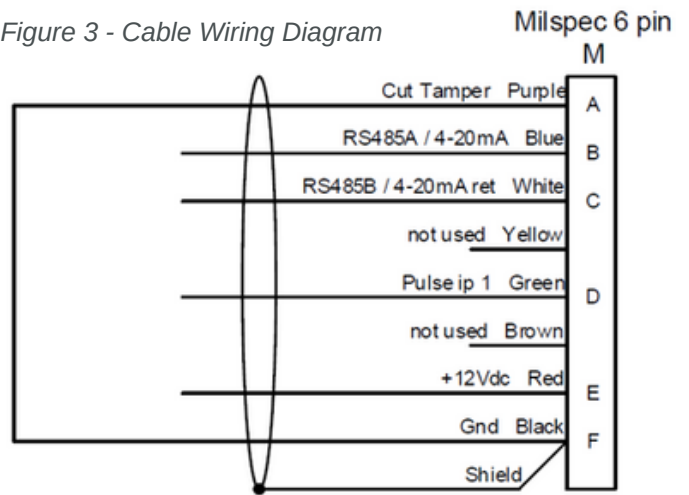


Figure 2 - Standard Cable Bare Wire (Flow Meter End)

Figure 3 - Cable Wiring Diagram



Do not connect shield at sensor  
Link purple and black wires at sensor for cable cut alarm.

- Install the YDOC on a pole or suitable structure. Optional pole mount bracket accessory is available to suit a 50 mm to 60 mm diameter pole (Figure 4 and 5). Larger diameter poles can be used however longer hose clamps will be required. Alternatively, the YDOC can be attached using the mounting wings of the enclosure. 4.5 mm holes have been provided.

Figure 4 - Pole Mounting of YDOC



Figure 5 - Pole Mounting Kit Parts



Figure 6 - Tamper Driver Bit







Figure 8 - Milspec connector

- Rout the meter cable through suitable conduit and secure the conduit.
- Terminate the meter cable to the meter as per the approved Water Meter wiring diagram.
- Check wiring and attach the cable connector to the YDOC connector (Figure 8). There is a locating groove at the front of the connector ensure the orientation is correct before connecting to the YDOC. Secure the locking ring firmly.
- Using the Tamper Driver Bit (Figure 6), remove the lid to the YDOC and remove the plastic battery tab to connect power to the YDOC. Ensure the power cable between the lid and the base is connected. Insert desiccant satchel into the YDOC.
- For option with external antenna, mount the antenna and fit cable to the gland (Figure 9) before connecting the antenna cable inside the YDOC and tighten the nut

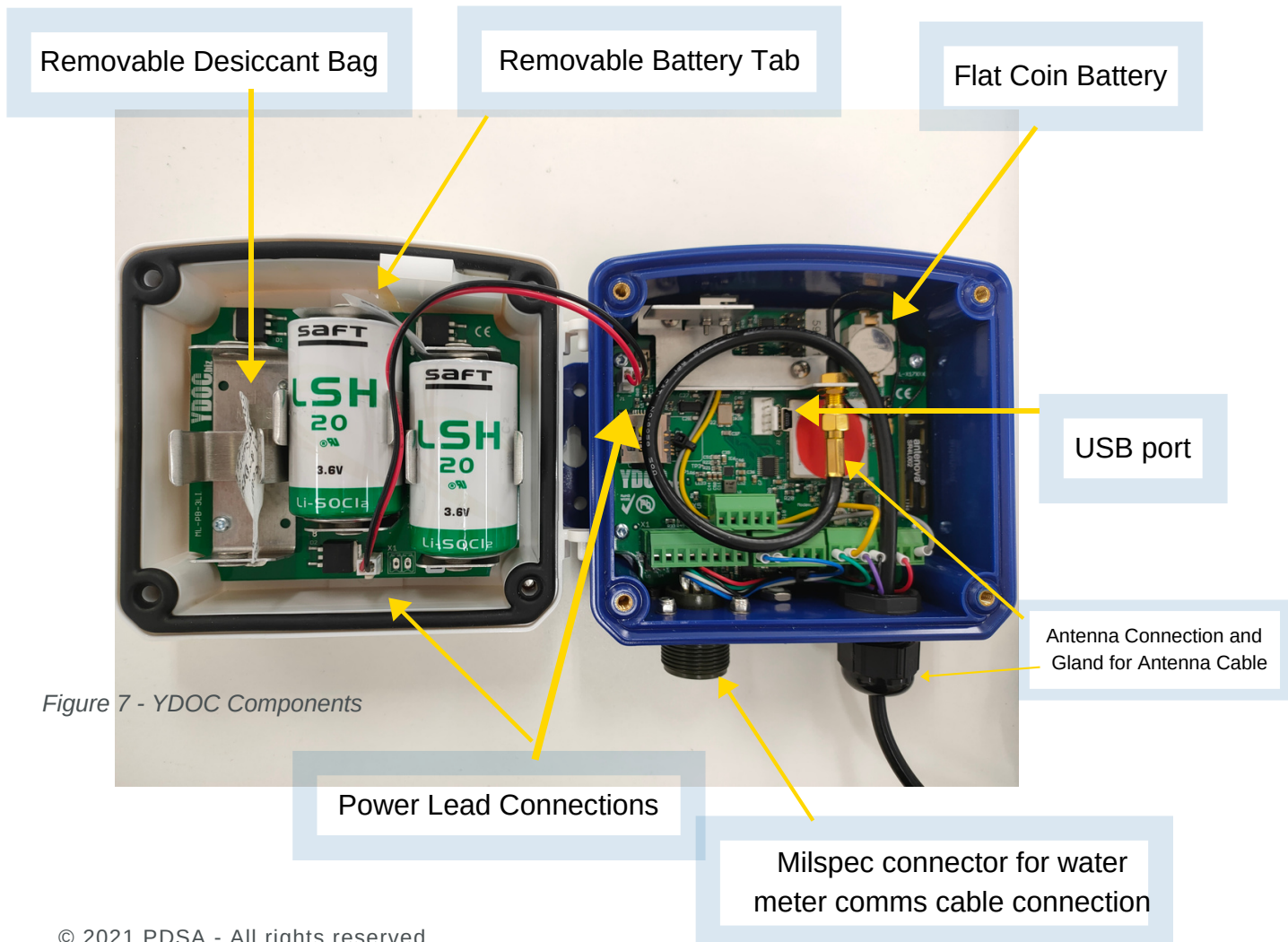


Figure 7 - YDOC Components

- The LED below the modem will light up during the YDOC and will update its internal clock via the internet, but will not upload any data to the DAS until a scheduled upload or tamper event.

Perform testing as per testing section 5.1 below

## 5.1. TESTING

Perform the following YDOC site test:

- Once the YDOC lid is removed connect to the Windows Laptop to the YDOC USB port on the PCB (Figure 7) using the USB to mini-USB lead.
- Open the YDOC terminal program on your Windows laptop and open a new COM-port Connection (Figure 9)
- Select the COM-port that corresponds to the YDOC. You can work out which COM-port to connect to by disconnecting the YDOC and seeing which port disappears from the list of options. If you connect to the wrong COM-port you will most likely just get a black screen with no text.

Figure 9 -  
YDOC Terminal  
Program Window

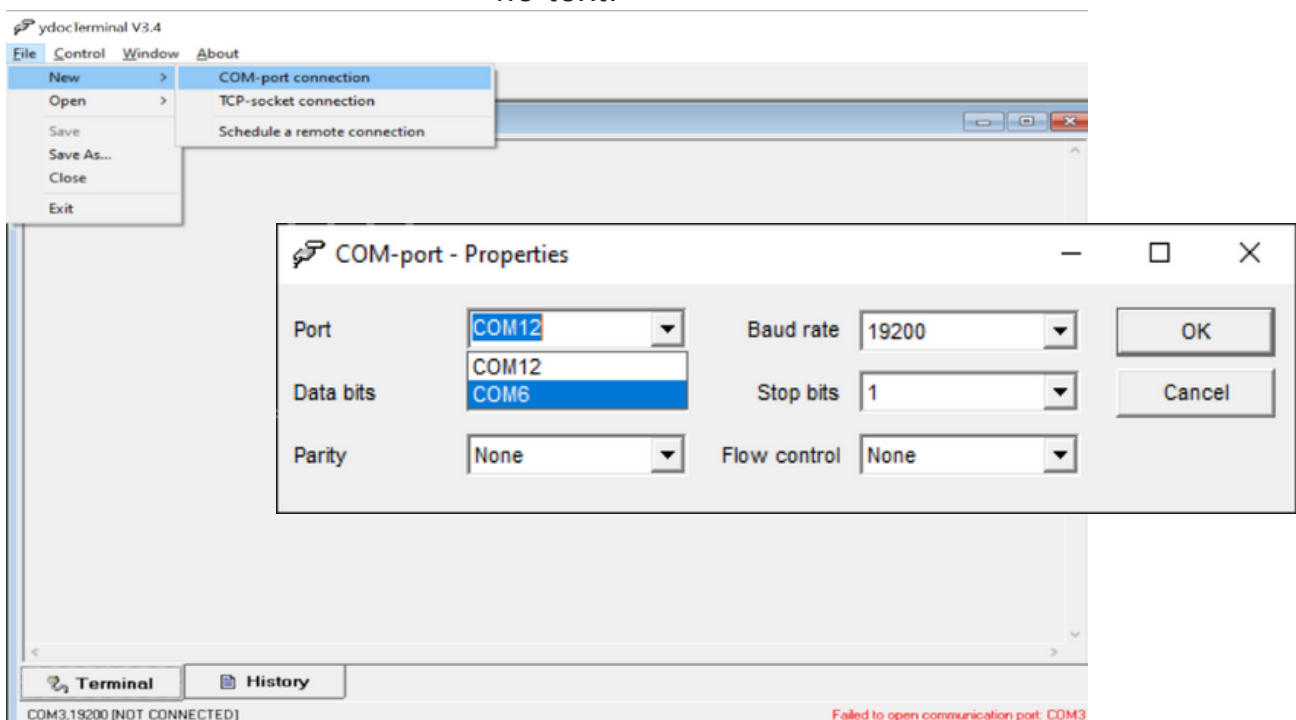


Figure 10 - Main Menu

```

<00:00:14>
ATE0:+CGSN
353081090210363
OK
AT#FASTSHDN=1,4
OK
Init BLE interface;Not detected
Init SD card;File system OK
Init System monitor
System log...POWER_ON;ML-417ADS;V4.0B7
Init TCP terminal
Init NTP time update
Init Sensor Internal
Init Sensor MODBUS
Init TCP
Running

ML-417ADS Logger Version 4.0 Build 7 (PDSA Demo #2 99021036)
Deployment postponed until 2020/04/23 06:54:52
- for Configuration Menu: Press <Ctrl>A<Shift>M<Ctrl>D
<06:54:52>
Deployment started
System log...SYS_DEPLOYED;PDSA Demo #2 99021036
Sensor power on
<06:54:53>
AT#SHDN
OK

```

Once connected, the main menu will appear (Figure 10).

- Ensure NTP Settings are correct Figure 10 shows an incorrect time upon start-up note the difference in the seconds shown. If not correct this will be updated in the testing ahead.
- Select the menu bar icon at the top of screen to go to the Configuration Menu screen. Select 3 for Configuration Setup

Figure 11 - Configuration Menu

```

Configuration Menu ML-417ADS Logger Version 4.0 Build 7
[0] Run
[1] Date & time >> 2020/08/26 19:41:26
[2] System information >> 99021036
[3] Configuration setup >> PDSA Demo #2
[4] Parameter overview >> 12
[5] Maintenance
[6] Users & rights
>

```

\*\*To navigate the menu, enter the number or letter that corresponds to the menu item you wish to navigate to at the prompt. All YDOC settings can be checked and diagnostic tests can be performed via this configuration interface.

DO NOT CHANGE ANY CONFIGURATION SETTINGS - YOUR YDOC IS PRE-CONFIGURED – ANY REPORTED ERROR IN CONFIGURATION MUST BE REPORTED TO PACIFIC DATA SYSTEMS AUSTRALIA. INCORRECT CONFIGURATION WILL LIKELY CAUSE A FAILURE TO LOG APPROPRIATE OR ACCURATE DATA. THIS GUIDE WILL ONLY TEST CONFIGURATIONS IF FOLLOWED CORRECTLY.

- Select [3] Configuration setup Menu Figure
- Perform the following:  
For Water Meters using a Pulse Output  
Select [8] Digital Inputs  
[T] Digital input test  
As pulses occur, you will see count on Port 1 increase on this screen as the YDOC receives pulses

Figure 12 Digital input Configuration for Pulse

```

Digital inputs
[0] Exit
[1] Port 1          >> flow
[2] Port 2          >> tamper
[3] Port 3          >> cableCut
[T] Digital input test >> Passed
>

```

Figure 13 Digital Input Test

```

Digital input test

Apply interrupts on the Digital input pin
When finished press any key

Port 1 Counter = 0
Port 2 Counter = 0
Port 3 Counter = 0

```

For Water Meters using a Modbus Output, from the configuration menu screen:

- [3] Configuration setup
- [A] Serial port
- [1] Flow Sensor
- [T] Test measurement

```

New configuration [1]
[3] Sensor power    >> Enabled; Warm up 00:00:01
[4] Sample interval >> Data log interval
[5] Protocol type   >> RTU
[6] Start command   >> Not used
[7] Ready status    >> Not used
[8] Ready after     >> Not used
[9] Register type   >> Input
[A] Start register  >> 1 (30002)
[B] Data type       >> WORD (unsigned 2 bytes)
[C] Parameter 1    >> Flow
[D] Parameter 2    >> Not used
[E] Parameter 3    >> Not used
[F] Parameter 4    >> Not used
[G] Parameter 5    >> Not used
[H] Parameter 6    >> Not used
[I] Parameter 7    >> Not used
[M] More parameters >> Not used
[R] Remove
[T] Test measurement
>Init Sensor MODBUS
Measuring...

2020/08/27 14:58:51 Actual Values
Flow1 Flow 32768

```

Ensure valid data is appearing here. If you see the “No response” note next to the value it means the YDOC did not receive a valid response from the water meter, which would most indicate a wiring or power issue.

Figure 14 Modbus Sensor Test Measurement

## 5.2. TRANSMISSION TESTING

```
Maintenance Menu ML-417ADS Logger Version 4.0 Build 7
```

```

[0] Exit
[1] Field testing
[2] COM port redirect
[3] Data download
[4] Format SD card
[5] Configuration download
[6] Configuration upload
[7] Firmware upgrade
[8] Modem maintenance
[9] Bootloader menu
>|

```

```
Field testing
```

```

[0] Exit
[1] Internal sensors test >> Passed
[2] Analog input test    >> Not done
[3] Digital input test   >> Passed
[4] SD card test         >> Not done
[5] Battery test         >> Not done
[-] Camera test          >> N/A
[7] Network signal test  >> Passed
[-] SMS alarm test       >> N/A
[9] APN login test       >> Passed
[A] NTP time update test >> Passed
[-] Email test           >> N/A
[-] FTP test             >> N/A
[D] TCP test             >> Passed
[-] HTTP test           >> N/A
[-] MQTT test           >> N/A
[-] SMS data test       >> N/A
[H] Prepaid balance
>|

```

```

AT+CME=2;+CPIN?
+CPIN: READY
OK
ATE0;&D1;&K3;+CCLK="34/02/10,13:44:48+00"
OK
AT+CGREG=2;+CGREG?
+CGREG: 2,1,"7026","8C8040D",8,"00"
OK
Registered on 4G network
AT+CGREG=0
OK
AT+CGDCONT?
+CGDCONT: 1,"IP","telstra.m2m","",0,0,0,0
OK
AT#SGACT?
#SGACT: 1,0
OK
<13:44:49>
AT#SGACTCFG=1,0;#SGACT=1,1
#SGACT: 10.122.115.66
OK
Modem idle

APN test OK
Press any key! >|

```

From the [Configuration menu](#) figure 11

Select [5] Maintenance menu

Select [1] Field Testing

Select [9] APN Test

Any APN Test will be performed and must say

**APN test OK**

ydocTerminal V3.4 - [New configuration [2]]

File Control Window About

File icons and navigation symbols

SD card test

```

Data log file      = 130 kB
Email file         = 0 Bytes
FTP file           = 0 Bytes
TCP file           = 644 Bytes
HTTP file          = 0 Bytes
MQTT file          = 0 Bytes
Satellite file    = 0 Bytes
SMS file           = 0 Bytes
Free disk space   = 7572 MB
File write/read OK

```

Press any key! >|

From the [Field Test](#) menu

perform and SD card test [4]

```

battery test

Battery voltage = 3.541 V
Battery current = 64 mA

Increasing power consumption...

Battery voltage = 3.549 V
Battery current = 69 mA

Battery resistance = -1600 m0hm

Was the Battery test OK?
Choose yes/no >|

```

From the Field Test menu perform a Battery test [5]

```

OK
+CGREG: 1,"7026","8C6220C",8,"00"
Registered on 4G network
AT+CGREG=0
OK
AT+CSQ
+CSQ: 99,6
OK
Network signal start
<16:14:44>
AT+CSQ
+CSQ: 99,5
OK
Network signal start
<16:14:46>
AT+CSQ
+CSQ: 24,5
OK
Signal bars (0-5)      = 5 (Excellent)
Signal quality (0-7)  = 0
Signal strength       = -65 dB
Raw signal value      = 24
Bit error rate        = 5
Modem idle

Is the signal OK?
Choose yes/no >

```

From the Field Test menu perform a Network signal test [7]

– to pass a signal test the db reading should be between -90 dB to zero.

If the number is lower than -90 dB (e.g. -110dB) this is considered a poor signal strength

```
<16:15:29>
NTP start
AT+CGDCONT?
+CGDCONT: 1,"IP","telstra.m2m","",
OK
AT#SGACT?
#SGACT: 1,0
OK
AT#SGACTCFG=1,0:#SGACT=1,1
#SGACT: 10.124.42.140
OK
AT#SD=1,1,123,"pool.ntp.org"
<16:15:30>
CONNECT
Modem data mode
<16:16:23>
2020/08/28 16:16:23
Modem command mode
OK
AT#SH=1
OK
End NTP OK
Modem idle

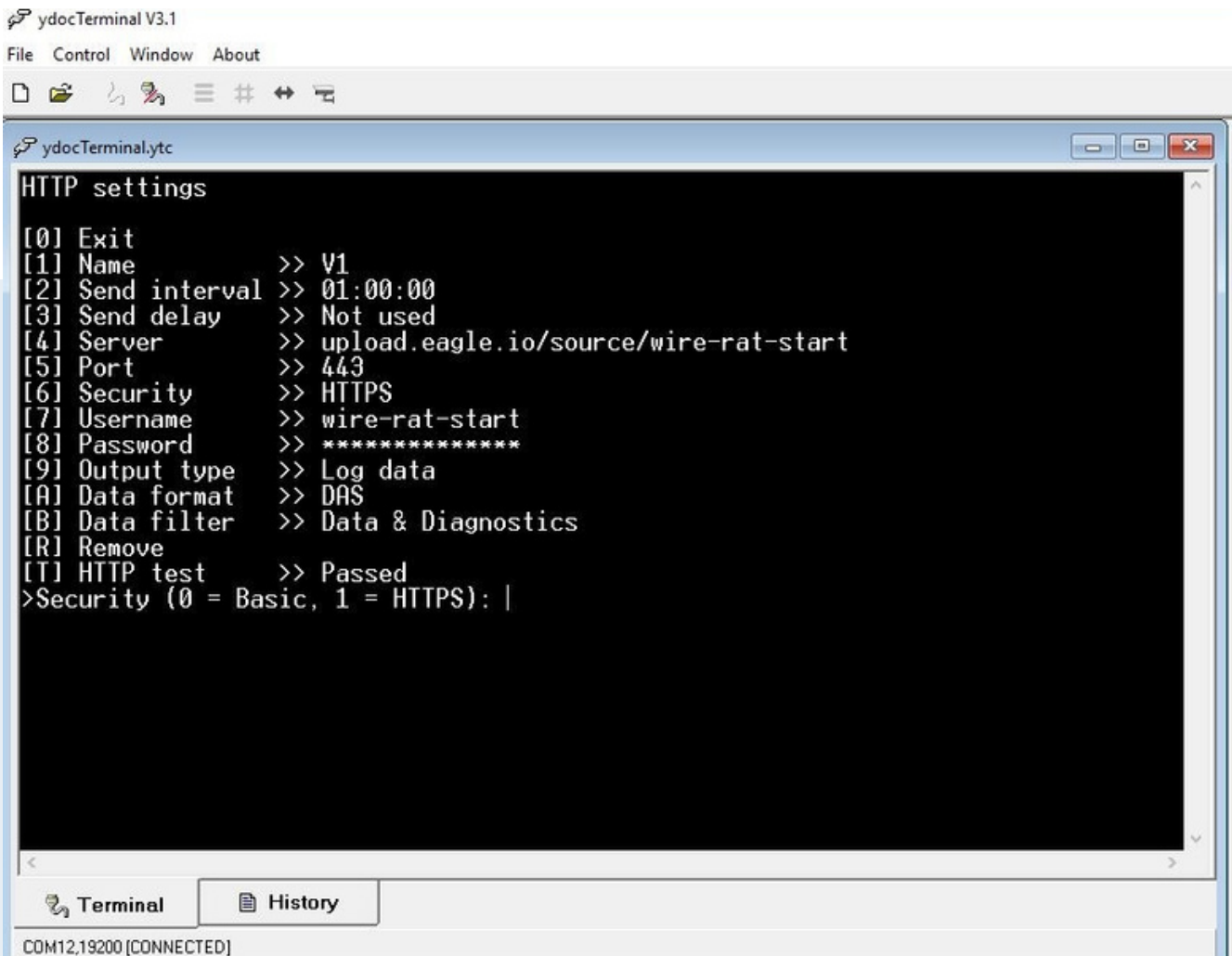
NTP time stamp test OK

Press any key! >
```

From the Field Test Menu  
Perform a NTP time update  
test [A]

From the Field test menu  
perform a HTTP test



A screenshot of a terminal window titled 'ydocTerminal V3.1'. The window has a menu bar with 'File', 'Control', 'Window', and 'About'. Below the menu bar is a toolbar with icons for file operations. The main terminal area shows a list of HTTP settings with their current values. At the bottom, there is a status bar showing 'COM12,19200 [CONNECTED]'.

```
ydocTerminal V3.1
File Control Window About
[0] Exit
[1] Name >> V1
[2] Send interval >> 01:00:00
[3] Send delay >> Not used
[4] Server >> upload.eagle.io/source/wire-rat-start
[5] Port >> 443
[6] Security >> HTTPS
[7] Username >> wire-rat-start
[8] Password >> *****
[9] Output type >> Log data
[A] Data format >> DAS
[B] Data filter >> Data & Diagnostics
[R] Remove
[T] HTTP test >> Passed
>Security (0 = Basic, 1 = HTTPS): |
```

This section describes how to conduct a test to ensure data is being transmitted correctly to the DAS. If the YDOC is open close it, screw the YDOC lid on and then take it off again triggering the tamper switch. An alarm message will be sent to the DAS.

**BE CAREFUL NOT TO DAMAGE ANY CABLES WHEN REFITTING THE YDOC LID TO THE BASE**

This will activate the YDOC to send a test transmission to Eagle IO to validate communications.

To Finalise Installation:

- Refit the YDOC lid
- Attach anti-tamper seals to the connector as per figure 10
- Attach anti-tamper seals to lid catch

**IMPORTANT!**  
**TAMPER EVIDENT SEALS ARE NSW GOVERNMENT ONLY ISSUED**  
**BY IRRIGATION AUSTRALIA**  
<https://www.irrigationaustralia.com.au/>

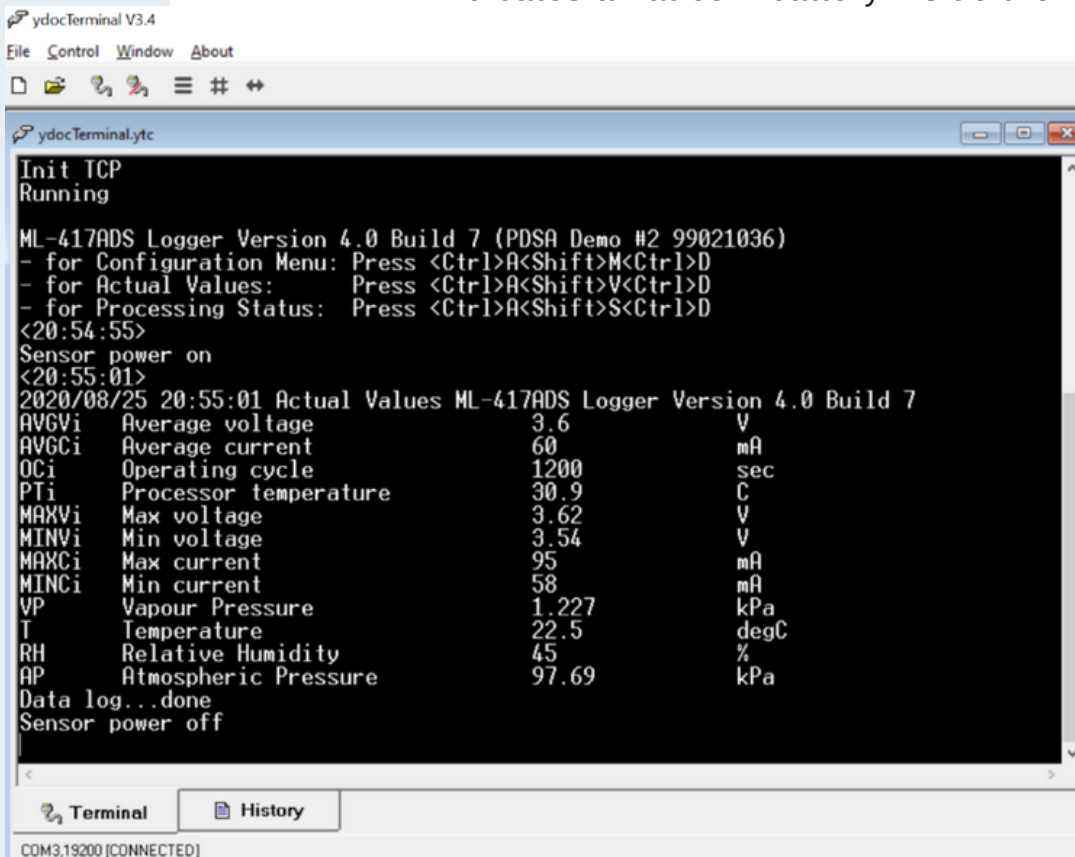


## 6. TROUBLESHOOTING

### 6.1. START-UP ERRORS

Most parts of the YDOC are tested at start-up. To monitor the messages which are issued at start-up, a PC running the YDOC Terminal program must be connected to the YDOC's internal USB port.

**Explanation:** The YDOC starts and initialises its peripherals. First, the YDOC performs a quick initialisation process which is followed by a description of the logger, including the firmware version and the current time in the YDOC. If the time specified by the YDOC before initialisation and after initialisation differs by a significant amount and the pre-initialisation timestamp around 00:00:10 – 00:00:20, then this indicates a flat coin battery inside the YDOC.



```

Init TCP
Running

ML-417ADS Logger Version 4.0 Build 7 (PDSA Demo #2 99021036)
- for Configuration Menu: Press <Ctrl>A<Shift>M<Ctrl>D
- for Actual Values:      Press <Ctrl>A<Shift>V<Ctrl>D
- for Processing Status:  Press <Ctrl>A<Shift>S<Ctrl>D
<20:54:55>
Sensor power on
<20:55:01>
2020/08/25 20:55:01 Actual Values ML-417ADS Logger Version 4.0 Build 7
AVGVi  Average voltage      3.6      V
AVGCI  Average current        60      mA
OCi    Operating cycle       1200    sec
PTi    Processor temperature  30.9    C
MAXVi  Max voltage               3.62    V
MINVi  Min voltage               3.54    V
MAXCI  Max current                95      mA
MINCI  Min current                58      mA
VP     Vapour Pressure           1.227   kPa
T      Temperature            22.5    degC
RH     Relative Humidity        45      %
AP     Atmospheric Pressure    97.69   kPa
Data log...done
Sensor power off
  
```

**There should be NO errors seen on start up.**

Figure 15 - Start Up Screen

If there are errors, refer to the YDOC event code list in 6.2 and contact your Pacific Data Systems Australia for assistance resolving.

A screen shot of the start-up messages submitted to our email address [nswwatermeters@pacdatasys.com.au](mailto:nswwatermeters@pacdatasys.com.au) with contact details will help to solve the problem.

## 6.2. YDOC EVENT CODE LIST

The following table details the event codes the device supports.

Table 1 - Event codes

Message code	Supplemental code/text	Meaning	Possible cause/reason
SYS_START	"System name & S/N"	System is started and deployed	At power on, or reset
SYS_DEPLOYED	"System name & S/N"	System is deployed	After a delayed deployment
SYS_UPGRADED	"System name & S/N"	Firmware upgrade detected	After firmware upgrade
CFG_CHANGED	"System name & S/N"	Configuration has changed	After configuration editing
CFG_ERR		Configuration error	Firmware downgrading, or configuration upload with different version
NO_CFG		No configuration detected	Data logger is not yet configured
CFG_UPL	"cause of failure"	Configuration upload failed	Disruption in the data transfer, or SD card failure
FW_UPG	"cause of failure"	Firmware upgrade failed	Disruption in the data transfer, or SD card failure
PVD_DIP	"number"	Power voltage detection dips	When the internal power (temporarily) drops unexpectedly below 2.8V (power has returned before switch off occurred)
SD_FAIL	"number"	Number of temporary SD card failures	SD card failure
WDT	"Sensor name"	Sensor driver name were the watchdog timeout occurred	Sensor defect, or wrongly connected, or warmup time too short
WDT	MODEM_INIT	Watchdog timeout while initializing Modem	No response from Modem, or no SIM, SIM not detected, PIN SIM

<b>WDT</b>	NETWORK_REG	Watchdog timeout while trying to register on a network	No response, or (temporarily) no network coverage, or SIM subscription failure (inactive/invalid/blocked or black listed)
<b>WDT</b>	APN_OPEN	Watchdog timeout while trying to find an internet access point	No response, or APN access point name wrong
<b>WDT</b>	APN_LOGIN	Watchdog timeout while trying to login into the internet access point	No response, or APN user or password wrong, or authentication failure
<b>WDT</b>	SERVER_LOGIN	Watchdog timeout while trying to login to the mail/FTP/TCP/HTTP server	No response, or server not available, or credentials wrong
<b>WDT</b>	FILE_OPEN	Watchdog timeout while trying to open a file on the FTP server	No response, or file handling error on the server
<b>WDT</b>	DATA_SENDING	Watchdog timeout while sending data to the mail/FTP/TCP/HTTP server	No response, or unexpected network disruption, or server error
<b>WDT</b>	TCP_RESPONCE	Watchdog timeout while waiting for acknowledge from the TCP/HTTP server	No response, or unexpected network disruption, or server error
<b>WDT</b>	DATA_END	Watchdog timeout while trying to disconnect from the Email/FTP/TCP/HTTP server connection	No response, or unexpected network disruption, or server error
<b>WDT</b>	"STATE number"	Modem state machine step where the watchdog timeout occurred	No response
<b>ERR</b>	"Driver name"	Shows the driver name were an error occurred, with if applicable some additional information	Sensor defect, or unknown failure
<b>ERR</b>	MODEM_INIT	Error while initializing Modem	No SIM, or SIM not detected, or PIN on SIM
<b>ERR</b>	NETWORK_REG	Error while trying to register on a network	(Temporarily) no network coverage, or SIM subscription failure (inactive/invalid/blocked or black listed)
<b>ERR</b>	APN_OPEN	Error while trying to find an internet access point	APN access point name wrong
<b>ERR</b>	APN_LOGIN	Error while trying to login to the internet access point	APN user or password wrong, or authentication failure
<b>ERR</b>	SERVER_LOGIN	Error while trying to login to the Email/FTP/TCP/HTTP server	Server not available or credentials wrong
<b>ERR</b>	FILE_OPEN	Error while trying to open a file on the FTP server	File handling error on the server
<b>ERR</b>	DATA_SENDING	Error while sending data to the Email/FTP/TCP/HTTP server	Unexpected network disruption, or server error
<b>ERR</b>	TCP_RESPONCE	Error while waiting for acknowledge from the TCP/HTTP server	Unexpected network disruption, or server error
<b>ERR</b>	DATA_END	Error trying to disconnect from the Email/FTP/TCP/HTTP server	Unexpected network disruption, or server error

ERR	"STATE number"	Modem state machine step were the error occurred	Unknown
SMS_SEND_ERR	An error occurred while sending SMS	See the Modem ERR/WDT message before for more details	
SMS_SEND_OK		Sending of the SMS was successful	
SMS_RECV_ACVA	"Phone number"	An ACVA SMS was received	
SMS_RECV_ERR	"Phone number"	An invalid SMS was received	
CNT_RESET	"digital sensor name"	Shows the reset of the pulse counter	When reset at midnight option is on, or after manual change
STR	"Driver name; raw data"	Shows the raw data log	When this option is enabled (generic serial string and GPS)
TIME_FIX	" +/- number of sec"	Shows the number seconds the internal clock was adjusted	After a NTP time synchronization
TIME_FIX	"Summer time started"	Shows that the clock is adjusted to the start of summer time	When summer time (daylight saving) option is enabled
TIME_FIX	"Summer time ended"	Shows that the clock is adjusted to the end of summer time	When summer time (daylight saving) option is enabled
ALARM_SET	"Code; limit; value"	Shows the parameter code, alarm limit and actual value	When the alarm is raised
ALARM_RESET	"Code; limit; value"	Shows the parameter code, alarm limit and actual value	When the alarm is cleared
SYS_START	"System name & S/N"	System is started and deployed	At YDOC power on, or reset
ALARM_SET	Tamper	Shows the parameter tamper alarm limit and actual value	When the tamper alarm is raised
ALARM_RESET	tamper	Shows the parameter tamper alarm limit and actual value	When the tamper alarm is cleared
ALARM_SET	cableCut	Shows the parameter cableCut alarm limit and actual value	When the cableCut alarm is raised
ALARM_RESET	cableCut	Shows the parameter cableCut alarm limit and actual value	When the cableCut alarm is cleared
PVD_DIP	"number"	Power voltage detection dips	When the internal power (temporarily) drops unexpectedly below 2.8V (power has returned before switch off occurred)

## 7. ROUTINE MAINTENANCE

- The system should be visually inspected by the land holder regularly, and the DQP should be notified of any issues/concern as soon as possible. Systems located in corrosive or coastal environments should be checked more frequently.
- Check that all the mountings are secure and free from damage and corrosion. Replace parts where required.

- Check the logger and connectors is clean and free from damage and there has been no sign of water or damage.
- Ensure all vents are clean.
- Check condition of the battery and replace if weak. Part No. YD-LSH20.
- Check the connection to the DAS and all the parameters are being logged.
- Replace Desiccant.
- Battery Replacement – Contact Pacific Data Systems Australia to order batteries (Item code YD-LSH20).

**For any further queries please contact  
Pacific Data Systems Australia**

[nswwatermeters@pacdatasys.com.au](mailto:nswwatermeters@pacdatasys.com.au)

## 8. WATER METER WIRING

The DQP is responsible for wiring the supplied cable to the water meter and to the connector on the YDOC.

## 9. YDOC INTERNAL WIRING GUIDE

Table 2 and 3 below and Figure 16 provide details about the connector wiring to the main board inside the YDOC.

Table 2 – Cable Colours

Wire Description	Wire Colour	Milspec Connector Pin	YDOC Terminal
Wire Cut Tamper	Purple (PL)	A	X3-3
RS485A / RS232 Tx / 4-20mA	Blue (BL)	B	X2-3
RS485B / RS232 Rx / 4-20mA return	White (WH)	C	X2-4
Pulse input 1	Green (GN)	D	X3-1
+12Vdc	Red (RD)	E	X4-1
Ground	Black (BK)	F	X3-4
Shield	Shield	F	X3-4

\* The purple (PL) wire is shorted to the black (BK / ground) wire inside the flow meter. This is used as a cable cut alarm.

\* Please do not connect the braided shield wire at the flow meter. If connected it may cause a ground loop fault.

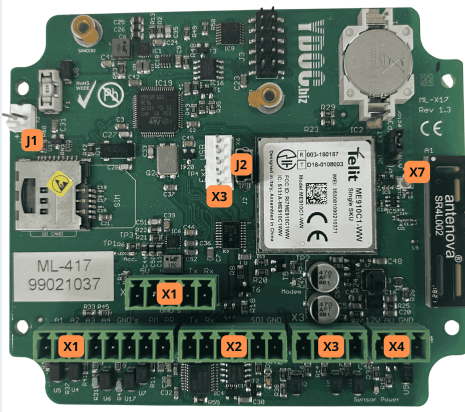


Figure 16 shows the internal PCB of the YDOC and Table 1 provides details on each connector.

Figure 16 - YDOC ML-417ADS-LI PCB

Table Table 3 - YDOC Wiring Table

CONNECTOR	PIN	NAME	DESCRIPTION	
X1	1	A2	0-20 mA input 1	Positive terminal analog input 1
	2	A2	0-20mA input 2	Positive terminal analog input 2
	3	A3	0-10 V input 3	Positive terminal analog input 3
	4	A4	0-10V input 4	Positive terminal analog input 4
	5,6	GND	GND	Ground
	7	PM	0-100% (0-33300mv) Input 5	Positive terminal input potentiometer- Analog 5
	8	PR	Reference voltage terminal	3.30V Potentiometric reference terminal
X2	1	Tx	RS232 TX	Transmit line RS232
	2	Rx	RS232 RX	Receive line RS232
	3	A+	RS485 A	+RS485 positive terminal
	4	B-	RS485 B	-RS485 negative terminal
	5	SDI	SDI-12(0-5V)	Terminal to connect SDI12 sensors
	6	GND	GND	Ground



<b>X3</b>	1	D1	Digital input 1 (0-5V)	Positive terminal digital input 1 or wake-up line
	2	D2	Digital input 2 (0-5V)	Positive terminal digital input 2
	3	D3	Digital input 3 (0-5V)	Positive terminal digital input 3
	4	GND	GND	Ground
<b>X4</b>	1	12V	100 or 200 mA (ML-x17) Sensor Power	Terminal to supply power to sensors
	2	AO	Alarm Output	Open collector (Max 100mA sink current)
	3	GND	GND	Ground
<b>X5</b>	1	5V	600mA or 800mA (ML-x17) acc power	To power an accessory (e.g. TFT, Camera, GPS)
	2,3	GNDs	GND	Ground
	4	Tx	RS232 TX	Transmit line RS232 to accessory RX
	5	Rx	RS232 RX	Receive line RS232 to accessory TX
<b>X6</b>	1		GND	USB Shield Ground
	2		GND	USB Ground
	3		USB-data P	Positive USB data signal
	4		USB-data N	Negative USB data signal
	5		USB_VBUS	USB bus 5 Volts input
<b>X7</b>			External Antenna connector	U.FL connector for external Antenna
<b>J1</b>	1		+VBAT (3.6V)	Positive terminal for power source
	2		-VBAT(3.6V)	Negative terminal for power source
<b>J2</b>			Internal USB connector	USB connector for local configuration

# 10. APPROVED LID COMPONENTS



**Integrated Antenna**  
CMP-ANT-0005  
Integrated antenna (2dB)

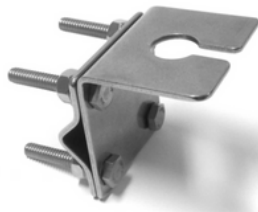


**Battery**  
SAFT LSH 20  
3.6 V Primary lithium-thionyl chloride (Li-SOCI<sub>2</sub>)

**YDOC LID Integrated Antenna**  
PDS-YD-NSW



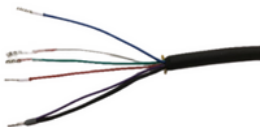
**YDOC LID External Antenna**  
PDS-YD-NSW-E



**External Antenna Mount**  
RF-MM2-SS



**External Antenna**  
RF-CD7294  
5dB



**Cable**  
Overall Foil Screen with Drain Wire, Tinned Foil, 8 Core, UV Stabilised, Black



**Pole Mount Kit**  
YDOC Pole Mount Kit  
YD-PMK

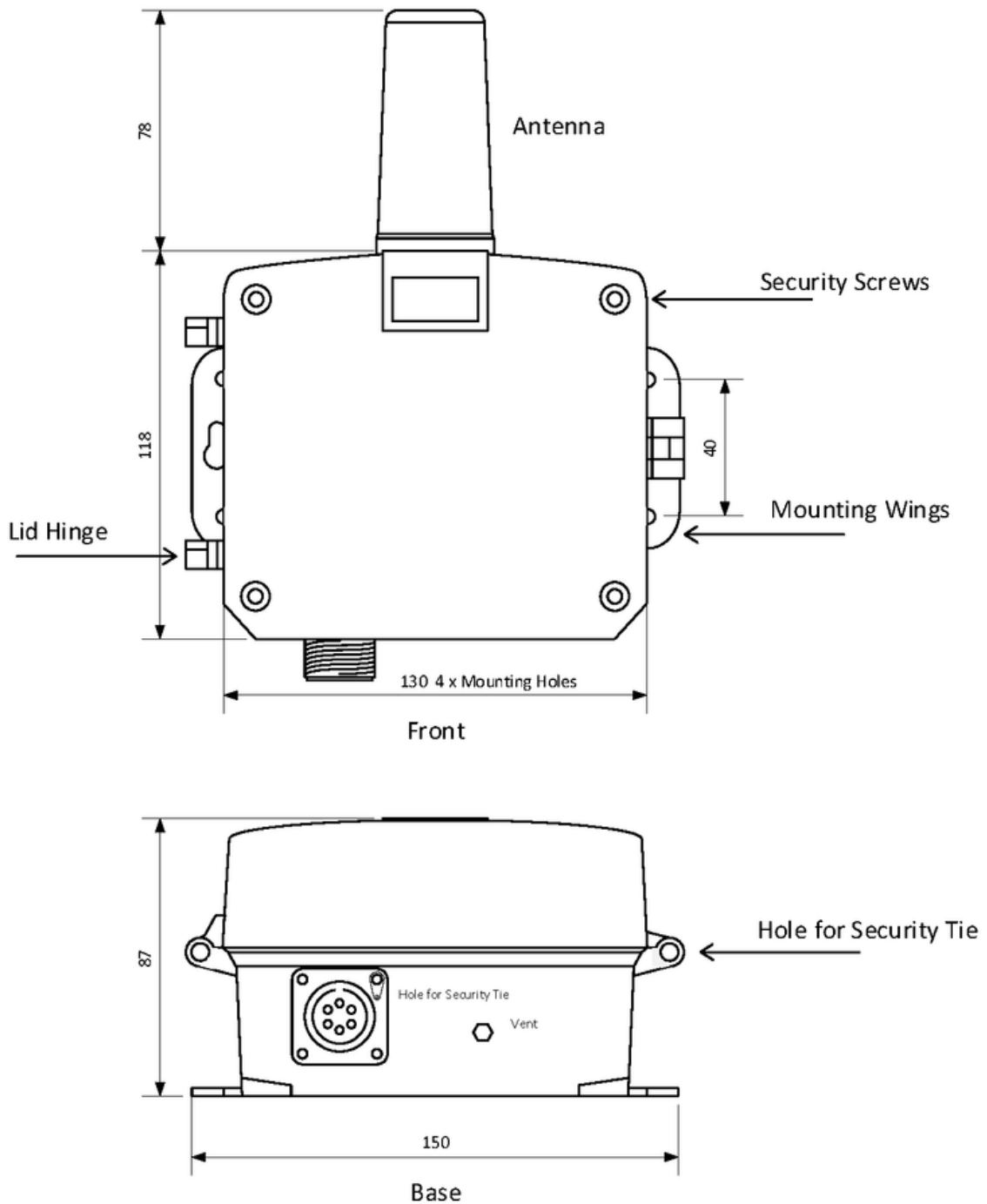
**Tamper Driver Bit**  
Tamper Driver Bit



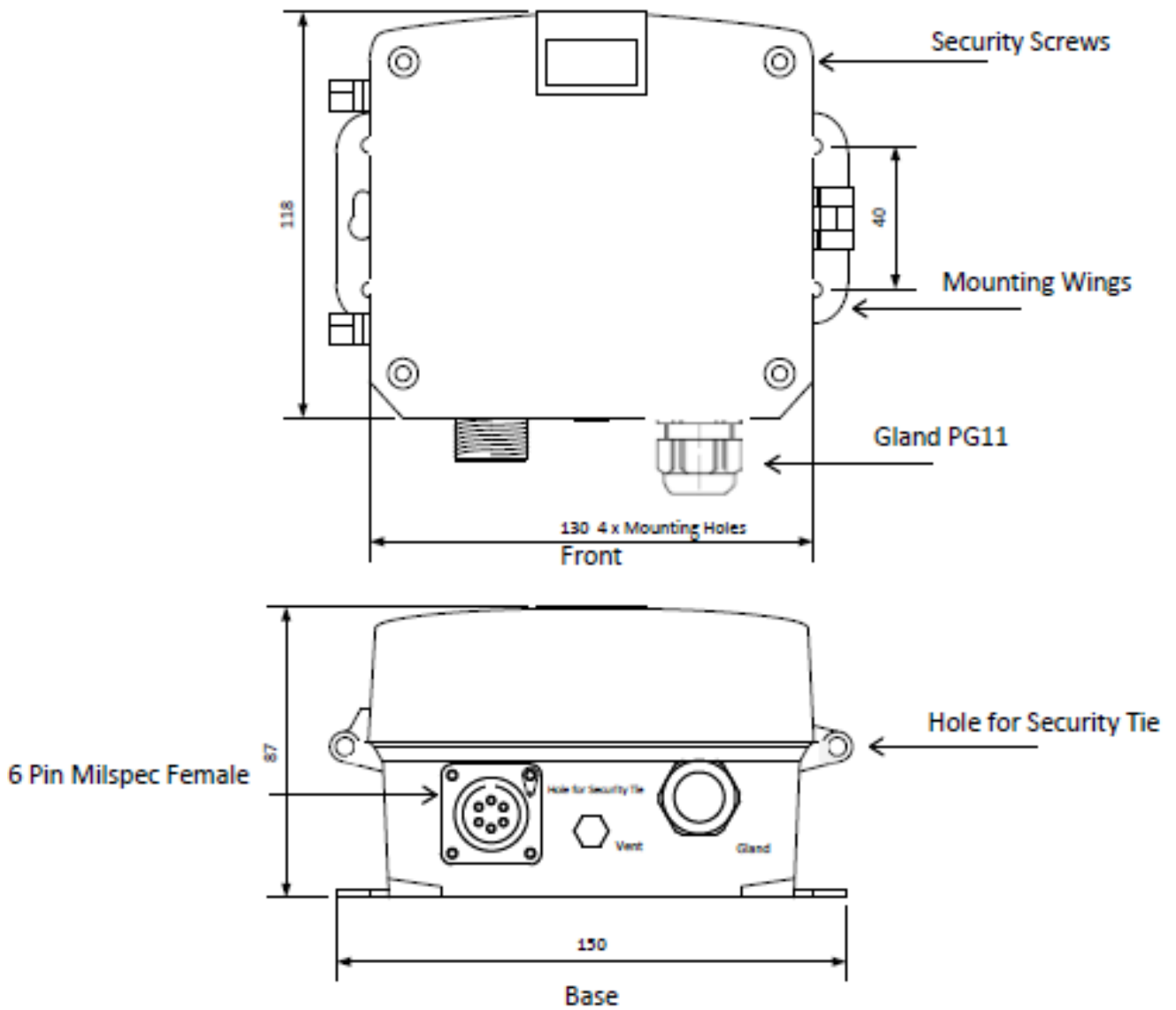
# 11. YDOC DIMENSIONS

All figures are in millimetres

PDS-YD-NSW YDOC LID with Integrated antenna



PDS-YD-NSW-E YDOC LID with external antenna



Thank you. For further assistance please email [nswwatermeters@pacdatasys.com.au](mailto:nswwatermeters@pacdatasys.com.au)