MERLIN Nitrogen Sleeve Monitor

&

MERLIN Communications Module with Nitrogen Sleeve Adapter

Installation Instructions

V3

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2. SAFETY INFORMATION ⚠

Please ensure you are familiar with the Safety Regulations of your Company and observe them at all times.

2.1 General Safety Summary

This manual contains information and warnings that must be observed to keep the unit in a safe condition and ensure safe operation. To use the unit correctly and safely, read and follow all precautions given. Please ensure you fully understand all instructions throughout this manual that relate to specific measurement functions. In addition, please follow all safety practices and procedures required when working on site.

2.2 Sensor Input Range

Please refer to the product datasheet for the technical specification of the sensor.

2.3 Sensor Burst Pressure

The sensor burst pressure is 100 bar, anything above this and the sensor housing can fail.

2.4 Battery Replacement

The MERLIN Nitrogen Sleeve Monitor uses a MERLIN GSM Pack and 2 x Alkaline PP3 batteries. Batteries can be replaced. Please contact Abriox to order replacement MERLIN GSM Packs.

The MERLIN Communications Module uses a MERLIN GSM Pack and are specific to the product. Battery packs can be replaced. Please contact Abriox to order replacement MERLIN GSM Packs.

The Nitrogen Sleeve Adapter batteries are enclosed in a sealed unit and cannot be replaced. Should you require a replacement adapter, please contact Abriox.

2.5 Disclaimer

If this equipment is used in a manner not specified by Abriox, the protection provided by the equipment may be impaired. Please ensure you follow all guidance for safe and correct use of your equipment.

2.6 Compliance

CE This product is CE marked which means that Abriox declares that the product or equipment complies with all applicable European Directives. A copy of the Certificate of Conformity can be obtained from Abriox.

FC This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

Do not make any changes or modifications to the equipment unless otherwise specified in the manual. If such changes or modifications should be made, you could be required to stop operation of the equipment.



This symbol indicates that this product is not to be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to a designated collection point, e.g., on an authorised one-for-one basis when you buy a new similar product or to an authorised collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, approved WEEE scheme or your household waste disposal service.

3. SOFTWARE COMPATIBILITY

MERLIN Nitrogen Sleeve monitors require iCPSM V3.06 or CPSM3 V3.06 or newer. Earlier versions are not compatible and do not support these features.

4. BEFORE GOING TO SITE

4.1 Check the HQ(s)

If you are using the web-based iCPSM system, make sure you have written down the phone number of your iCSPM HQ and you have your login information.

If you are using the PC-based CPSM3 software, make sure you have written down the phone number of your HQ(s) and the system is installed and running*.

Note

*It is vital the CPSM3 software is installed and running prior to going to site otherwise the installation will fail.

4.2 Check the Cabinet or Test Post is Suitably Prepared

Ensure that the cabinet or test post where the unit will be installed, has adequate room to house the unit (dimensions of the units can be found at the end of this document).

Check the pressure fitting is suitable for the sensor (1/4" BSPT).

The length of the cable from the unit to the sensor is approximately 1.8m, which should be more than adequate for most installations.

Please ensure the sensor is installed in a horizontal position or in a manner so that water cannot enter the sensor housing.

4.3 Check and Designate the MERLIN Communications Module

Check that the MERLIN Communications Module (located "inside" the MERLIN Nitrogen Sleeve Monitor) has a SIM installed and the phone number of the SIM is on the label on the front of the unit. This will have been done during production testing – unless you have chosen to use your own SIMs.

Write the pipeline name (up to 30 characters) and the location name (up to 50 characters) on the MERLIN front label with a permanent marker pen or using a label maker.

Remember – you will have to text these details to the MERLIN unit so, to avoid mistakes, do not make them longer than necessary.

Note

Do not exceed the character limitation for Pipeline (up to 30 characters) and Location (up to 50 characters) as the system will shorten the names and they will not install as you had intended.

4.4 Equipment Check

Make sure you have the following equipment prior to going to site.

Item	Description
Magnet	A strong magnet to activate the unit on site
Tool Kit	Tool kit for the installation at the cabinet/test post
Documents	Installation instructions
Mobile Phone	Used for setting up the unit. See the next section for messages you can store in your phone before going to site to make installation easier

4.5 Setting Up Your Mobile Phone

If you store the text messages required for installation prior to going on site, it will be easier and save time in the field. Write the messages on your mobile phone and save them as a Draft, Template or Outgoing Message. You must use the international format (+44 for UK, then the area code without a leading zero) for all mobile communications.

Commands to save:



`CMD:READ`

Tells the unit to take an immediate reading.



`CMD:CONFIG HQ1:+441234567891 HQ2:+441234567892`

Tells the unit the headquarters (HQs) to report in to (where the numbers in light grey are the respective telephone numbers of your CPSM / iCPSM HQs). If you only have a single HQ you can set HQ2 to OFF. See section 5.5 for further details.



`CMD:INSTALL PIPE:PIPELINE NAME LOC:TR NAME`

Sets the units Pipeline name and Location name.

You can use the `CMD:READ` and `CMD:CONFIG` commands for all the MERLIN monitors you are going to install.

You will need a separate `CMD:INSTALL` for each unit to give it its own name.

Note

You will need to set the phone's SMS message validity to 1 hour to prevent an SMS message getting stuck. For example, if an install message gets stuck in the network and arrives 3 days late, the units' clock will be set 3 days slow. Setting the message validity to 1 hour stops this happening.

5. ON SITE

5.1 Installing the MERLIN Nitrogen Sleeve Monitor in a Cabinet

A) Open the cabinet

B) Close the shut off valve

C) Check there is sufficient room for the MERLIN Nitrogen Sleeve Monitor for mounting inside the cabinet (taking into account the cable from the unit to the sensor which is approximately 1.8m). The unit comes complete with mounting brackets for ease of installation. The unit should ideally be located at the top of the cabinet in order to get the very best GSM reception. *See note below

D) Once the unit is mounted, disconnect the sensor from the cable - this makes fitting the sensor to the pressure valve much easier

E) Fit the sensor to the pressure valve, take care not to over tighten the fitting

F) Reconnect the cable to the sensor, noting the connecting orientation pin

G) Open the shut off valve to allow pressure to the sensor

H) Check for any sign of leakage

I) Activate the unit (see section 5.3)

J) Take a reading (see section 5.4)

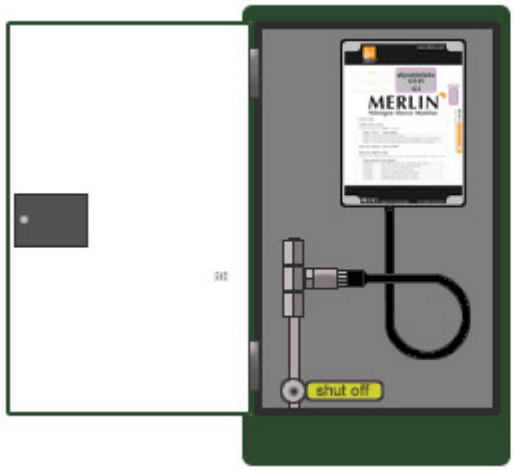
K) Configure the HQ(s) (see section 5.5)

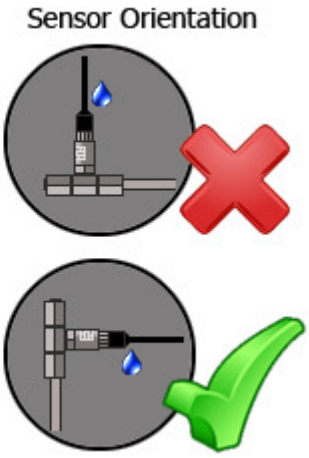
L) Name the unit (see section 5.6)

M) Finish on site (see section 5.7)

Note

*If the unit is being installed inside a plastic cabinet, the standard MERLIN Nitrogen Sleeve Monitor should get a sufficient GSM signal. If the unit is being installed inside a metal cabinet or you are experiencing a very low GSM signal within a plastic cabinet, try using an alternate network SIM card to see if this improves the signal. If you still experience problems getting a signal you may require an external antenna version of the MERLIN Nitrogen Sleeve Monitor.





Please ensure the sensor is installed in a horizontal position or with the cable exit facing downwards. This is required to avoid water ponding in the rear of the sensor.

5.2 Installing the MERLIN Communications Module with Nitrogen Sleeve Adapter in a Test Post

A) Open the test post

B) Close the shut off valve

C) Check there is sufficient room for the MERLIN Communications Module with Nitrogen Sleeve Adapter for mounting inside the post (taking into account the cable from the unit to the sensor which is approximately 1.8m). *See note below

D) Once the unit is mounted, disconnect the sensor from the cable - this makes fitting the sensor to the pressure valve much easier

E) Fit the sensor to the pressure valve, take care not to over tighten the fitting

F) Reconnect the cable to the sensor, noting the connecting orientation pin

G) Open the shut off valve to allow pressure to the sensor

H) Check for any sign of leakage

I) Activate the unit (see section 5.3)

J) Take a reading (see section 5.4)

K) Configure the HQ(s) (see section 5.5)

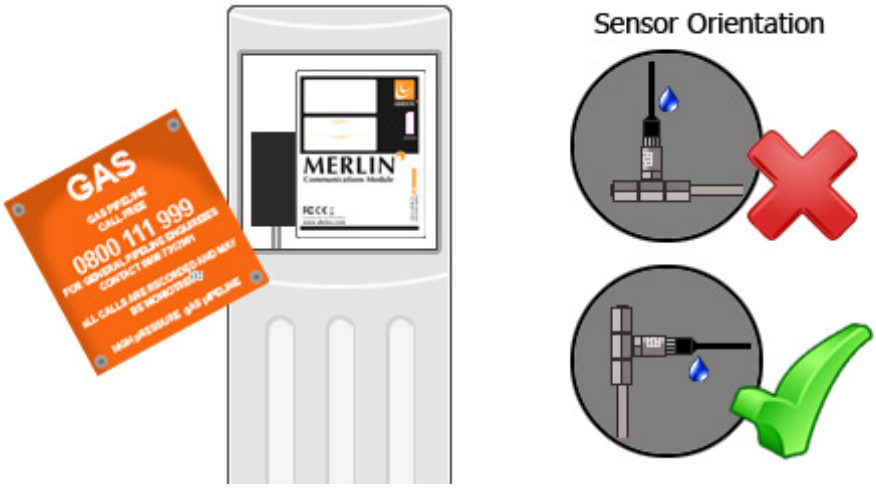
L) Name the unit (see section 5.6)

M) Finish on site (see section 5.7)

Note

*If the unit is being installed inside a plastic test post, the standard MERLIN Nitrogen Sleeve Monitor should get a sufficient GSM signal.

If the unit is being installed inside a metal post or you are experiencing a very low GSM signal within a plastic post, try using an alternate network SIM card to see if this improves the signal. If you still experience problems getting a signal you may require an external antenna version of the MERLIN Communications Module.

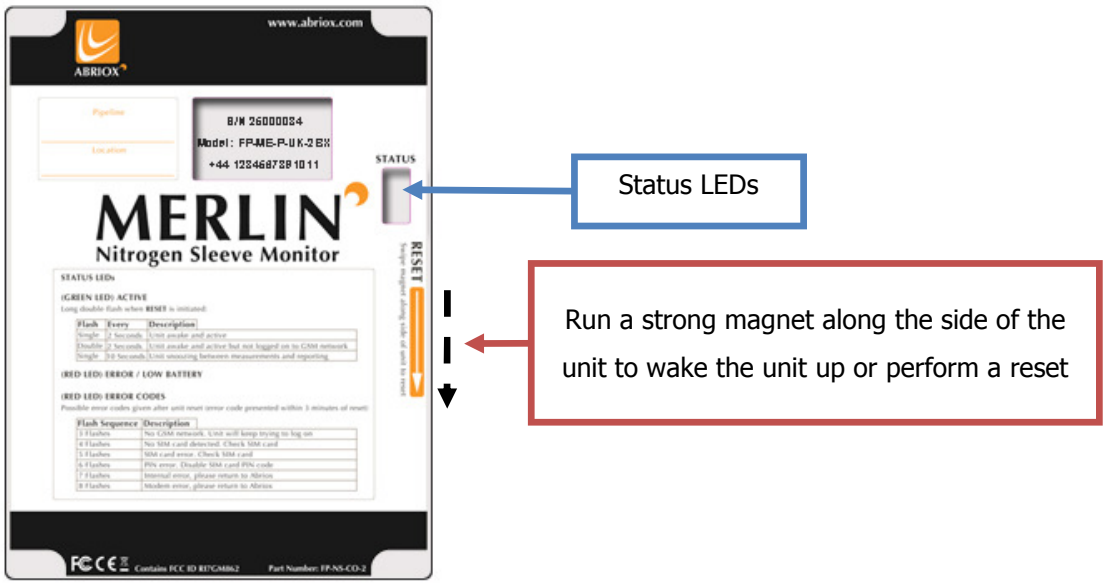


Please ensure the sensor is installed in a horizontal position or with the cable exit facing downwards. This is required to avoid water ponding in the rear of the sensor.

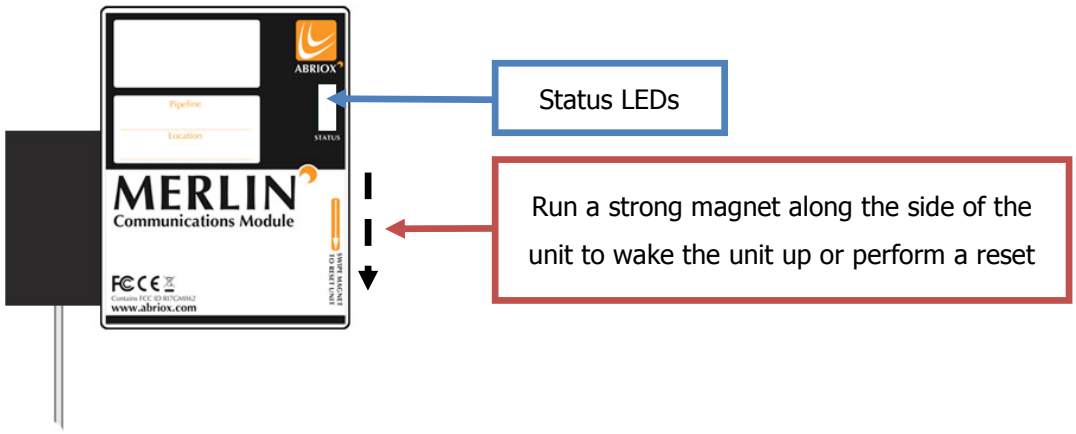
5.3 Activating the Unit

Activate the unit by running a strong magnet along the side of the unit where shown (see below). The green status LED should flash twice to show that the unit is waking up.

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After 60 seconds, the green LED should start flashing once every 2 seconds, this confirms the unit has logged onto the GSM network. You may now continue to configure the unit by taking a read, configuring the HQ(s) and finalising the installation by giving the unit a Pipeline Name and Location (see the next section for further details on each step).

The unit will continue to listen for text messages for 20 minutes after waking up or after a reset. During this time the green LED will flash once every 2 seconds. After the 20 minutes have expired, the unit will enter a low power mode and the LED will stop flashing (or flash once every 10 seconds).

Note

If the green LED is double-flashing every 2 seconds, then the unit is running but cannot log onto the GSM network. Please refer to the MERLIN LED Descriptions document for full details of the status LEDs.

5.4 Take a Reading

Retrieve the pre-stored `CMD:READ` text from your mobile phone and send (or forward) it to the phone number on the front of the unit. The unit will then take a reading and send it back to your mobile phone within 60 seconds.

Example:



Message Sent: `CMD:READ`

Reply: `CPM:020 UNIT:20000001 POST 1DC:19000mV 1AC:0mV 2DC:1000mV 2AC:0mV 3DC:0mV 3AC:0mV`

The reply will consist of:-

Message Text	Description
CPM:020	System response code
UNIT:20000001	The serial number of the MERLIN unit
POST	The type of MERLIN
1DC:19000mV	This shows the sensor battery level. Above 18000mV is good
1AC:0mV	Not Used
2DC:1000mV	This channel shows the pressure. Typically between 1000mV - 2000mV*
2AC:0mV	Not Used
3DC:0mV	Not Used
3AC:0mV	Not Used

If the value of 2DC is not as expected, check the readings with a pressure gauge. If the readings are inconsistent with the pressure gauge, check the connection to the sensor.

Note

*The pressure reading is displayed in millivolts. This is a limitation of the SMS functions in the unit. The software (iCPSM and CPSM) will show the correct units in bar. A 10 bar sensor will convert as 1mV = 1mb.

5.5 Configure the HQ(s)

Retrieve the pre-stored `CMD:CONFIG` text from your phone and send it to the unit. Wait for the reply and check that the HQ(s) numbers in the reply are correct. If they are not the numbers of your HQ(s) then check that your pre-stored text message sent the correct numbers – it may have contained a mistake. In any case, resend the `CMD:CONFIG` message ensuring that the numbers are correct. If you have only a single HQ then you only need send the HQ1 number, HQ2 is set to OFF (see example below).

Example (Single HQ):



Message Sent: `CMD:CONFIG HQ1:+441234567891 HQ2:OFF`

Reply: `CPM:009 UNIT:20000001 MTIME:05:00 RDAY:TUE RTIME:12:30 RETRY:1 RETRY-HRS:6 ACK:MSG LED:ON HQ1:+441234567891 HQ2:OFF`

Example (2 HQs):



Message Sent: `CMD:CONFIG HQ1:+441234567891 HQ2:+441234567892`

Reply: `CPM:009 UNIT:20000001 MTIME:05:00 RDAY:TUE RTIME:12:30 RETRY:1 RETRY-HRS:6 ACK:MSG LED:ON HQ1:+441234567891 HQ2:+441234567892`

The reply will consist of:-

Message Text	Description
`CPM:009`	System response code
`UNIT:20000001`	The serial number of the unit
`MTIME:05:00`	Shows the daily measurement time HH:MM
`RDAY:TUE`	Shows the reporting day of the week
`RTIME:12:30`	Shows the reporting time of day HH:MM
`RETRY:1`	Shows the number of report retries: 0, 1, 2
`RETRY-HRS:6`	Shows the interval between report retries
`ACK:MSG`	Shows the type of acknowledge the unit should request: SMS (MSG) or a Delivery
`LED:ON`	The LEDs on the unit can be set to: OFF, ON or DIS (Discreet)
`HQ1:+441234567891`	HQ 1 Telephone Number
`HQ2:+441234567892`	HQ 2 Telephone Number (this can be set to OFF if there is no second HQ)

Note

One or more parameters may be changed with a single text message. If the command is sent without any parameters, the reply still contains all current configuration settings. For further information on all SMS User Commands, please refer to the MERLIN SMS User Commands document.

5.6 Name the Unit

Before naming the unit, a `CMD:CONFIG` command must be sent to setup the HQ1 and HQ2 numbers (so that the unit knows where to send its install message).

Retrieve the pre-stored `CMD:INSTALL` text from your phone and edit the Pipeline name and Location name.

Send this text message to the unit. Wait for the "successfully installed" reply from the HQ(s) - this could take a minute or two.

Example:



Message Sent: `CMD:INSTALL PIPE:PIPELINE NORTH LOC:MAIN TR FENTON`

Reply: `PIPELINE NORTH/MAIN TR FENTON INSTALLED SUCCESSFULLY`

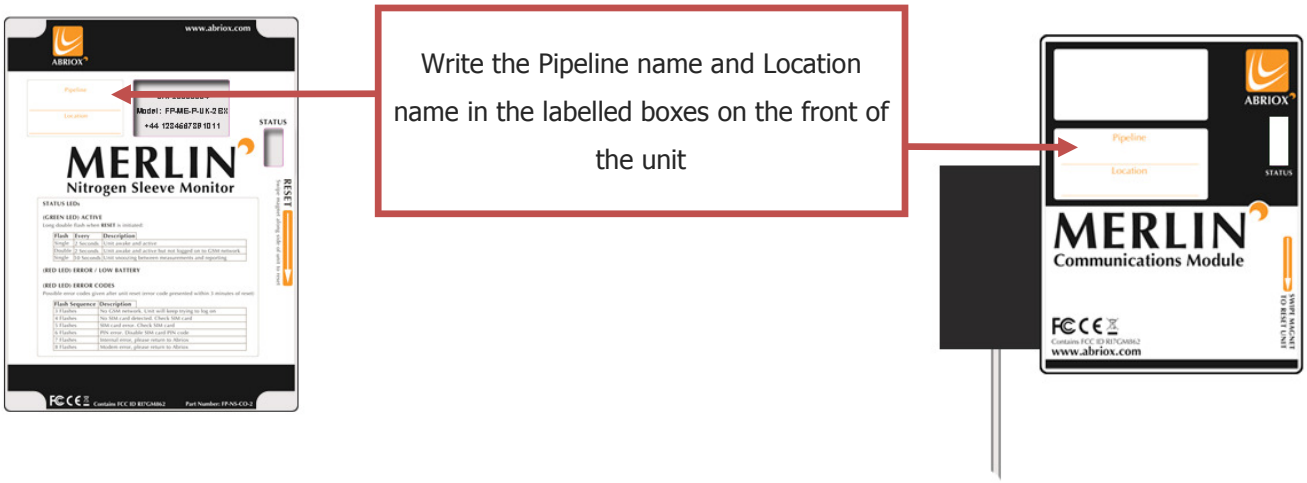
You can have multiple units with the same Pipeline name but each unit must have its own unique Location name.

Note

The `PIPE:` and `LOC:` text are not case sensitive and will be converted to uppercase by the system. The names can include spaces, punctuation and numbers but not "`LOC:`" or "`PIPE:`".

5.7 Finish On Site

If you haven't already, write the Pipeline name and Location name on the front of the unit in the labelled boxes. We recommend using a label maker to ensure a tidy finish.



The unit is now installed and you can close up the cabinet / test post.

6. POST SITE CONFIGURATION

Once the physical installation has been completed, it's time to configure the unit in your chosen software (iCPSM or CPSM3).

You will need to configure the following:-

Alarm Thresholds

Allows you to specify the high and low values that trigger an alarm. Alarms can be sent via email or text message to selected people/companies.

Measurement Time

Allows you to specify the time and day of when the unit takes its measurements.

6.1 iCPSM Users

For users who choose the web-based iCPSM - simply go to **www.icpsm.com** in your chosen browser and log in with your Abriox issued Username and Password.

6.2 CPSM3 Users

Launch CPSM3 by double clicking the icon from the task bar.

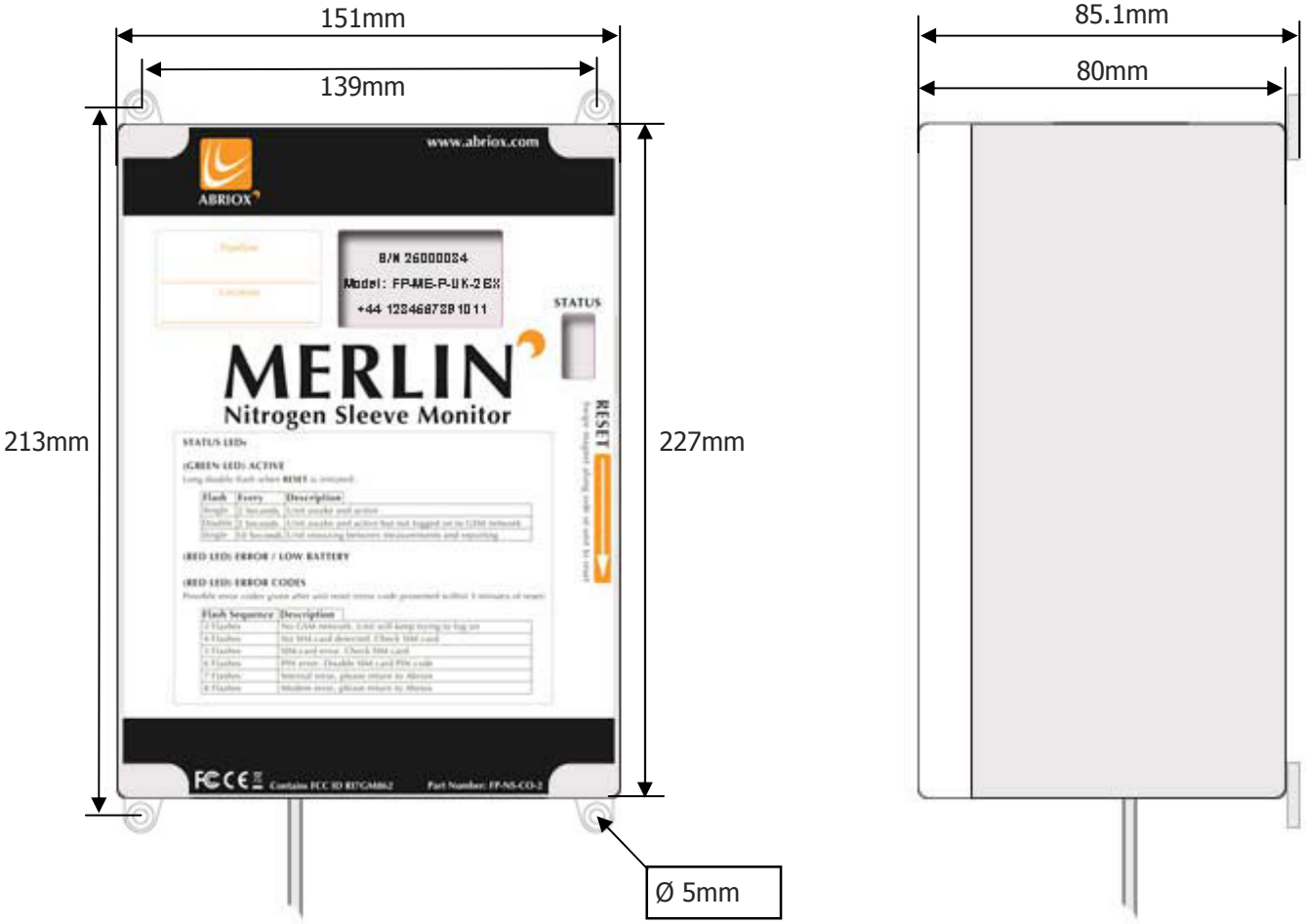


Note

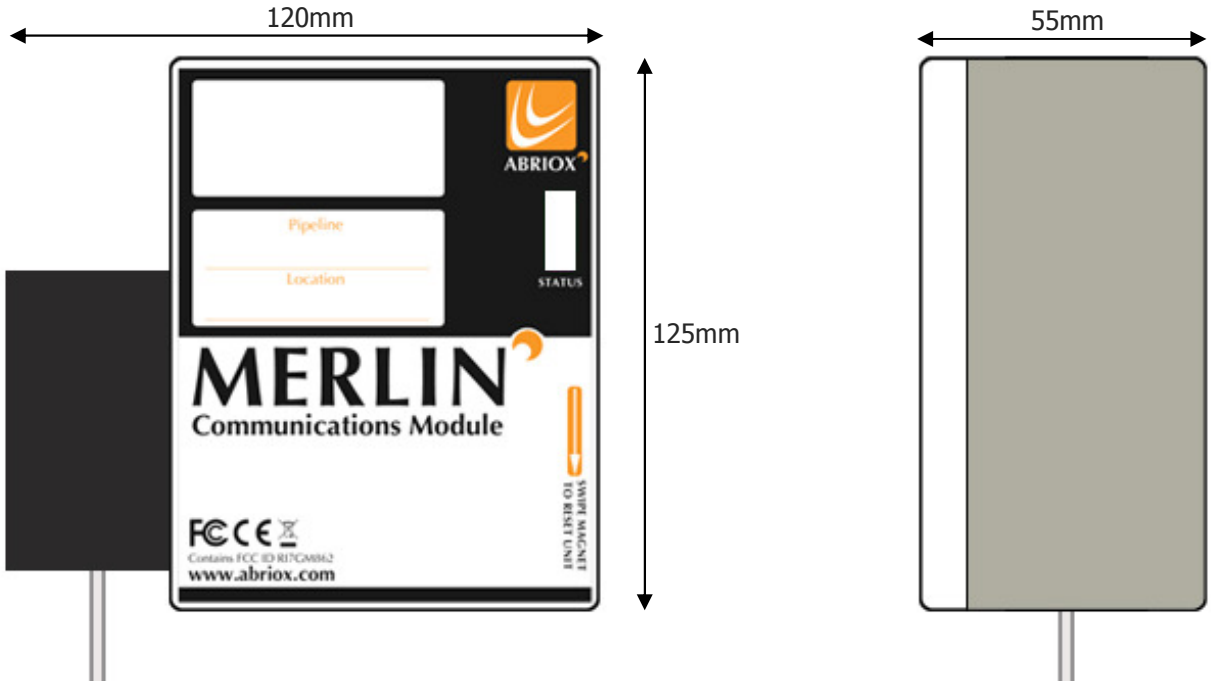
For further information on using iCPSM / CPSM3 please refer to the relevant documentation.

7. DIMENSIONS

7.1 MERLIN Nitrogen Sleeve Monitor



7.2 MERLIN Communications Module with Nitrogen Sleeve Adapter



8. NOTES