Doc No. 1723-PS-0016
Issue 1

User Manual

MetPak Base Station

MetPak Base Station Part: 1723-1A-X-XXX

Foreword

Thank you for purchasing the MetPak Base Station manufactured by Gill Instruments Ltd. To achieve optimum performance we recommend that you read the whole of this manual before proceeding with use.

Gill products are in continuous development and therefore specifications may be subject to change and design improvements without prior notice.

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Cautions and Notes

The following symbols are used in this guide:

CAUTION. This indicates an important operating instruction that should be followed to avoid any potential damage to hardware or property, loss of data, or personal injury.

NOTE. This indicates important information to help you make the best use of this product.

Applicable Parts

MetPak Base Station 1723-1A-1-111 (Base Station only).

MetPak Base Station 1723-1A-2-111 (with White WindSonic Option 2).

MetPak Base Station 1723-1A-3-211 (with Heated WindSonic M).

MetPak Base Station 1723-1A-4-311 (with Heated WindObserver 70).

MetPak Base Station 1723-1A-5-111 (with WindMaster).

MetPak Base Station 1723-1A-6-111 (with WindMaster Pro).

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1. Introduction

MetPak Base Station is a compact multi-sensor instrument that measures the most essential weather parameters. It also provides a data collection system that allows customers to add their own selection of sensors to meet local requirements. A Gill Instruments Ultrasonic Sensor can be used to measure wind speed and direction. Temperature and Humidity are measured and Dewpoint calculated using an industry standard probe housed in a naturally aspirated radiation shield. Barometric pressure is measured using an industry standard sensor.

The Wind Sensor can be chosen from a 2 axis WindSonic Option 2 (white), WindSonic M Heated, WindObserver 70 enhanced heated or a 3 axis WindMaster or WindMaster Pro.

The MetPak Base Station combines all the instrument data into a single combined data string. This may be configured for digital ASCII RS232/RS422/RS485 (2 wire point to point) and digital SDI-12 outputs.

The instrument uses a rugged mounting clamp that attaches to any vertical pipe up from 30mm to 58mm diameter.

The Base Station electrical Hub box comes with a pre-installed 10 Metre cable to connect to a Gill Wind Sensor. There is one cable gland allocated to provide entry for termination of other sensors and one cable gland for data/power cables.

A Heater Interface box (optional accessory) allows for termination of the Base Station 10 Metre cable to a heated Wind Sensor and Heater power supply.

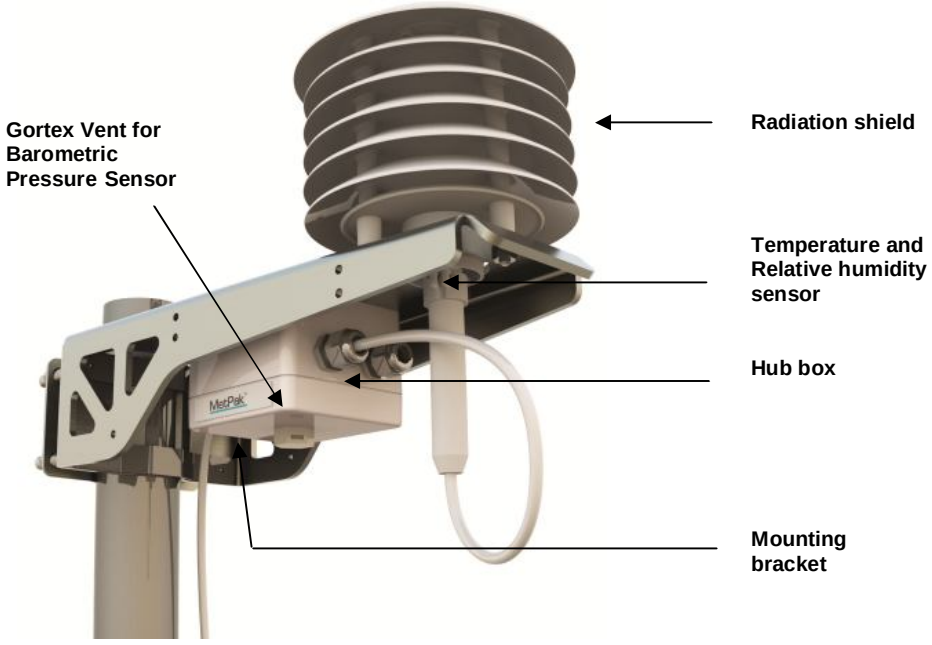


Figure 1 MetPak Base Station

1.1 Principle of Operation

1.1.1 Wind Speed and Direction Sensor

The MetPak Base Station can be used with Gill 2axis (WindSonic or WindObserver) or 3 axis (WindMaster or WindMaster Pro) wind speed and direction sensors. They are connected via the supplied RS422 10 Metre lead. The sensors measure the times taken for an ultrasonic pulse of sound to travel from the North transducer to the South transducer, and compares it with the time for a pulse to travel from S to N transducer. Likewise times are compared between West and East, and E and W transducer.

If, for example, a North wind is blowing, then the time taken for the pulse to travel from N to S will be faster than from S to N, whereas the W to E, and E to W times will be the same. The wind speed and direction can then be calculated from the differences in the times of flight on each axis. This calculation is independent of factors such as temperature.

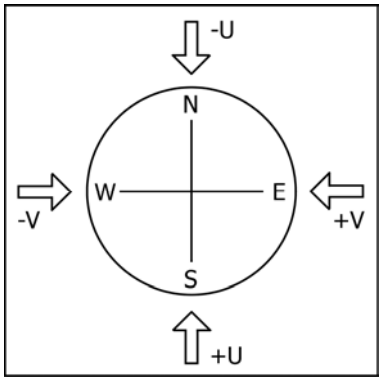


Figure 1 U and V Compass points 2 Axis Instruments

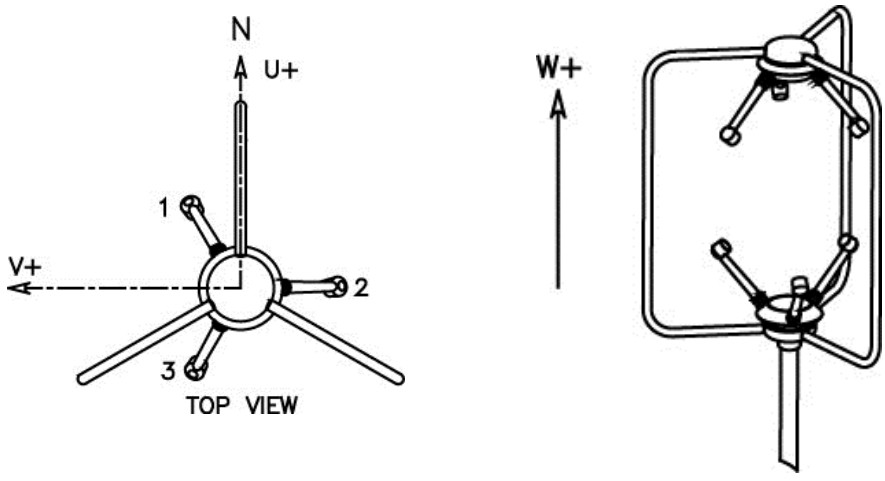


Figure 2 Compass points and polarity of U, V and W on a 3 axis instrument.

1.1.2 Radiation Shield

The Multi-Plate Radiation Shield protects temperature and relative humidity sensors from error-producing solar radiation and precipitation. This shield relies on a combination of plate geometry, material and natural ventilation to provide effective shielding.

1.1.3 Temperature and Relative Humidity Sensor with Dewpoint Output

The Rotronic HygroClip module is a complete instrument, with integrated temperature compensation. Calibration data is maintained within the integrated electronics. It provides digital output signals for Relative Humidity, Temperature and Dewpoint to the MetPak Base Station Hub box.

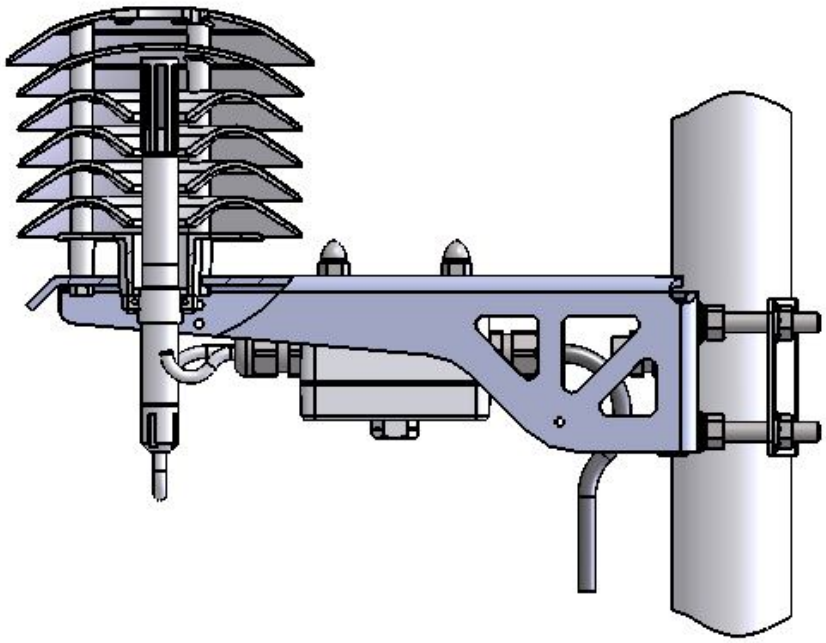


Figure 2 Position of Temperature and Relative Humidity Probe in the Radiation Shield

1.1.4 Barometric Pressure

Barometric pressure output is provided by a solid-state device fitted on to the circuit board in the MetPak Base Station Hub box. Vent to atmosphere is via a Gortex filter which also protects the pressure sensor from the effects of wind and rain.

1.2 Abbreviations

Table 1 Abbreviations

Item	Meaning
ASCII	American Standard Code for Information Interchange
C	Centigrade
CAL	Calibration
CD	Compact Disc
COM	Communications
CR	Carriage Return
CSV	Comma Separated Variable
ETX	End of String
F	Fahrenheit
FPM	Feet per Minute
HF	High Frequency
HPA	Hecto-Pascals
HTML	Hyper Text Markup Language
Hz	Hertz
IMM	International Maritime Mobile
In Hg	Inches of Mercury
K	Kelvin
KPH	Kilometres per Hour
KTS	Knots
LF	Line Feed
M Bar	Milli Bars
Max	Maximum
MF	Medium Frequency
Min	Minimum
Mm Hg	Millimetres of Mercury
MPH	Miles per Hour
MS	Microsoft
MS	Metres per Second
NSEW	North South East West
NVM	Non-Volatile Memory
PC	IBM compatible Personal Computer
ROM	Read Only Memory
RS232	Communications standard
RS422	Communications standard
Rx	Receive
RXD	Received Data
SDI-12	Serial – Data Interface standard for microprocessor based sensors
STX	Start of String
Tx	Transmit
TXD	Transmitted Data
VHF	Very High Frequency
WMO	World Meteorological Organisation

2. Installation

MetPak Base Station has been designed to meet and exceed the stringent standards listed in its specification (see Para 6.1).

2.1 Pre-Installation Checks

As with any sophisticated electronics, good engineering practice should be followed to ensure correct operation:

- Ensure the MetPak Base Station and Wind Sensor will not be affected by other equipment operating locally, which may not conform to current standards, e.g. radio/radar transmitters, generators etc.
- Avoid mounting in the plane of any radar scanner – a vertical separation of at least 2m should be achieved.
- When installing MetPak Base Station and Wind Sensor near radio transmitting antennas, ensure that the mounting position fulfills the following minimum separations (all round):
- VHF IMM – 1m
- MF/HF – 5m
- Satcom – 5m (avoid likely lines of sight)
- Use cables recommended by Gill (see Para 2.2.3). If cables are cut and re-connected incorrectly (perhaps in a junction box) then EMC performance may be compromised if cable screen integrity is not maintained.
- Avoid earth loops – wire the system in accordance with these installation guidelines.
- Ensure that the power supply operates to the MetPak Base Station and Wind Sensor specification (see Para 6.1) at all times.
- Avoid turbulence caused by surrounding structures that will affect the accuracy of the sensors such as trees, masts and buildings. The WMO make the following recommendations. The standard exposure of wind instruments over level open terrain is 10m above the ground. Open terrain is defined as an area where the distance between the sensor and any obstruction is at least 10 times the height of the obstruction.
- Keep away from building exhaust vents, machinery and motors.

2.1.1 Spare Parts

1723-10-051	RS232 to USB 1.8M configuration cable (excluding WindObserver and WindMaster/Pro connected units).
1723-PK-024	Pressure Sensor Filter Spares kit.
1723-PK-025	Hygroclip Filter Replacement Kit (2 Filters).
1723-PK-099	Heater Power Interface Box.

2.2 Installation

2.2.1 Bench system test

Prior to physically mounting the MetPak Base Station in its final location, we strongly recommend that a bench system test is carried out to confirm the system is configured correctly, is fully functional and electrically compatible with the selected host system and cabling (preferably utilising the final cable length). The required data format, units, output rate, and other options should also all be set up at this stage.

2.2.2 Bench Test Equipment Required

1723-2A-X-XXX/X MetPak Base Station set for RS232 communication (factory default setting).

1723-10-051 MetPak Base Station RS232 to USB 1.8M configuration cable with integral 5v power (for WindSonic units only). Otherwise use RS232 I/F converter and separate 12v to 30 dc power supply.

ES-U-1001-A EasySynch RS232 to USB adaptor or equivalent (if not using Gill part 1723-10-051) or connect directly to an RS232 COM port.

Power Supply 12Vdc to 30Vdc at 100mA if required.

Belden 9503 3 pair communications and power cable (if not using Gill Part 1723-10-051), length as required.

Belden cable with up to 6 pairs for Analogue, Digital and PRT inputs.

Gill MetSet Software supplied on the MetPak Base Station CD or download from. http://www.gill.co.uk/main/software.html

Wind Sensor- should be configured as per the following list:-

1405-PK-072 WindSonic Option 2 White

M4,U1,O1,L1,P1,B4,H2,NQ,F1,E2,T1,S4,C2,G0,K0,

1405-PK-200 WindSonic M Heated

M4,U1,O1,L1,P1,B4,H2,NQ,F1,E2,T1,S4,C2,G0,K0,

1390-70-B-312 WindObserver 70 heated with short connector base.

Note - Firmware Version V 6.02 onwards

M4,U1,O1,L1,P1,B4,H2,NQ,F1,E2,T1,S4,C2,G0,K0,

1590-PK-020 WindMaster

M4,U1,O1,L1,P1,B4,H2,NQ,E1,T1,S1,C2,A4,I1,J1,V1,X1,G0,K0,F1 1,F2 0,F3 1

1561-PK-020 WindMaster Pro

M4,U1,O1,L1,P1,B4,H2,NQ,E1,T1,S1,C2,A4,I1,J1,V1,X1,G0,K0,F1 1,F2 0,F3 1

For Power Supply/Supplies and cables suitable for the chosen Wind sensor see relevant wind sensor manual supplied with the sensor or download from http://www.gill.co.uk/data/manuals/manuals.htm .

2.2.3 Cabling

Base Station RS422 10 Metre Cabling

The MetPak Base Station comes with an integral 10 Metre, Belden 8104 cable fitted to the hub box connector J4, (RS422 interface).

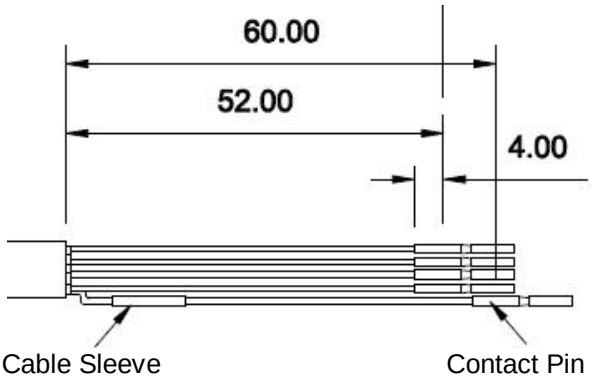
It is terminated in Clipper connector solder contacts for installing into a WindSonic Option 2 or WindMaster/WindMaster Pro Connector (connectors supplied with the Wind Sensor).

If used with a WindObserver 70 or WindSonic M the contact pins will need to be cut off and wire stripped/soldered for termination into the Heater Power Interface Box.

Details on fitting the connector pins on the 10 Metre cable into the WindSonic option 2 or WindMaster/WindMaster Pro connector are as follows:-

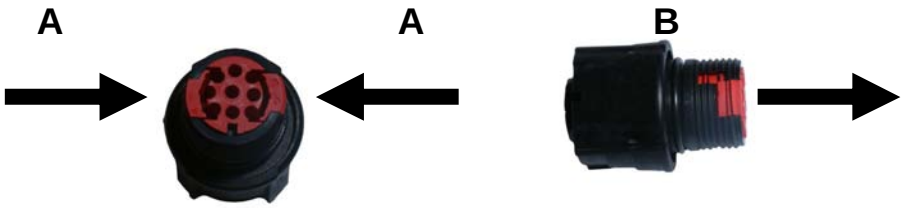
If shortening the 10 Metre cable to a required length, strip and prepare as follows:-

1. Trim back the screened cable outer PVC sheath to 52mm.
2. Trim back the braid and drain wire to 20mm from the outer sheath.
3. Separate braid and drain wire from the foil and cores. Twist braid and drain wires together.
4. Trim the twisted braid and drain wire to 15mm from the outer sheath and tin ends 5mm.
5. Cut the foil and White/Green wire back to within 5mm of the outer sheath.
6. Strip and tin one end of the White/Green wire removed to 5mm.
7. Locate White/Green wire to twisted braid and drain wire and solder.
8. Insulate the White/Green wire joint.
9. Strip back the connection wires by 4mm and tin solder.
10. Solder the contact pins supplied with the connector to the wires.
11. Note that the sensor connector supplies the correct strain relief for cables with an outside diameter of 6-12mm.



Route the cable through the connector parts as in direction shown below (WindSonic connector shown, the WindMaster Connector is similar).

Whilst squeezing the red retainer in the direction of ARROWS A, pull in the direction of ARROW B.

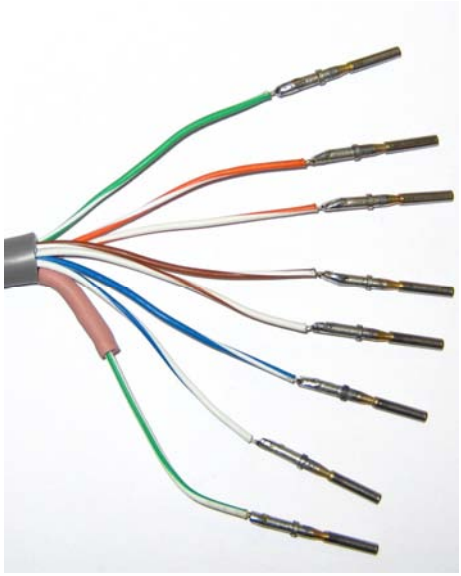


Your connector should now resemble the connector in the picture below.

Insert each contact pin until you feel a slight click. If you have inserted the contact into the incorrect hole it can be removed at this point by simply pulling it out. Please note there will be some resistance.

WindSonic (Option 2) RS422 10 Metre Cable Connections

Connections for the WindSonic connector are as follows:-



Green/White wire to Connector Pin 1

Orange/White wire to Connector Pin 2

White/Orange wire to Connector Pin 3

Brown/White wire to Connector Pin 4

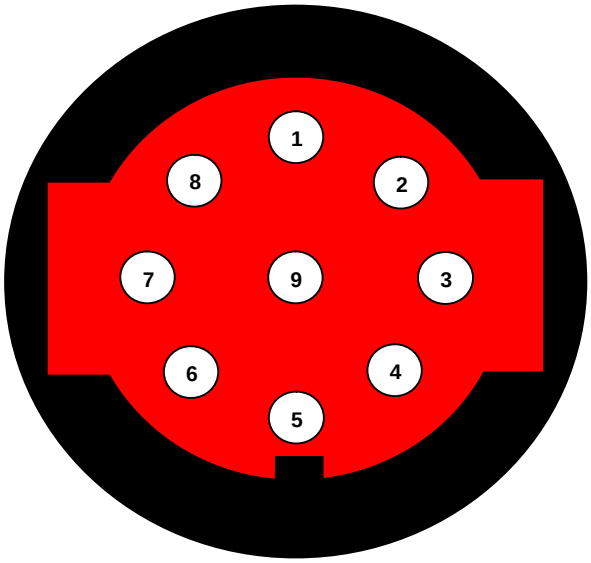
White/Brown wire to Connector Pin 5

Blue/White wire to Connector Pin 6

White/Blue wire to Connector Pin 7

White/Green cut off at sleeve

Rear View of Connector



Continue to insert all of the contacts you require. Once all of the contacts are inserted squeeze the 2 red retainers (See Arrows A on previous page) into place. NB. The retainer can only be pushed back into place if the contacts are fully engaged.

Fit the connector to the WindSonic Sensor so that you can finish assembling the connector.

Screw the back shell onto the connector until it is fully in place. Please note that the final rotations can be slightly stiff.

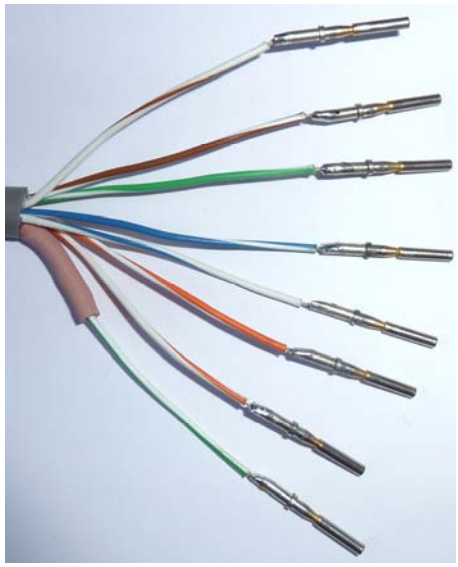
Now screw the next part of the connector into place.

Now screw the cable-clamping nut into place.

The connector can now be removed from the WindSonic.
NOTE: To disassemble the connector, reverse this procedure.

WindMaster and WindMaster Pro RS422 10 Metre Cable Connections

The WindMaster uses the same range of connector as the WindSonic except for being a 31 way type. Follow the WindSonic connector assembly procedure except for:-



White/Brown wire to Connector Pin 1

Brown/White wire to Connector Pin 2

Green/White wire to Connector Pin 4

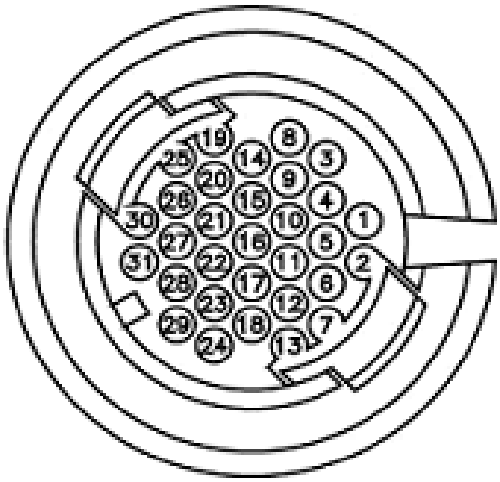
Blue/White wire to Connector Pin 5

White/Blue wire to Connector Pin 6

Orange/White wire to Connector Pin 11

White/Orange wire to Connector Pin 12

White/Green wire to Connector Pin 31



WindMaster 31 way Connector Pin outs

WindSonic M (Heated) RS422 10 Metre Cable Connections to the Heater Power Interface Box.

Note: See also the lid of the Heater Power Interface Box for Connection Details.

Cut off the contact pins connected to the MetPak Base Station 10 Metre cable, strip and solder wires. Connect wires to the Heater Power Interface box as follows:-

Remote Base Station **10 Metre Cable**	**Heater Power Interface Box** **8 Way Terminal Block**	**WindSonic M (Heated)** **9 Way Connector**
White/Green	8	1
Green/White	7	No Connection
Orange/White	6	2
White/Orange	5	3
Brown/White	4	4
White/Brown	3	5
Blue/White	2	6
White/Blue	1	7
No Connection	No Connection	8
No Connection	No Connection	9

Heater Power Supply	**Heater Power Interface Box** **4 Way Terminal Block**	**WindSonic M (Heated)** **9 Way Connector**
Heater Supply +ve	3	8
Heater Supply -ve	2	9

WindObserver 70 (Enhanced Heated) RS422 10 Metre Cable Connections to the Heater Power Interface Box.

Note: See also the lid of the Heater Power Interface Box for Connection Details.

Cut off the contact pins connected to the MetPak Base Station 10 Metre cable, strip and solder wires. Connect wires to the Heater Power Interface box as follows:-

Remote Base Station **10 Metre Cable**	**Heater Power Interface Box** **8 Way Terminal Block**	**WindObserver 70 (Enhanced Heated)** **19 Way Connector**
White/Green	8 or Screen Terminal Tag	Cable Screen/Drain wires
Green/White	7	M
Orange/White	6	R
White/Orange	5	D
Brown/White	4	P
White/Brown	3	C
Blue/White	2	U
White/Blue	1	V
No Connection	No Connection	A, E and H
No Connection	No Connection	B, F and G

Heater Power Supply	**Heater Power Interface Box** **4 Way Terminal Block**	**WindObserver 70 (Enhanced Heated)** **19 Way Connector**
Heater Supply +ve	3	A, E and H
Heater Supply -ve	2	B, F and G

Remote Base Communication Cabling

MetPak Base Station has five communication connection options:

- USB (using the 1.8m Gill USB cable, Part No. 1723-10-051).
- RS232
- RS422
- RS485 (two wire point to point).
- SDI-12 (Not with 3 axis WindMaster and WindMaster pro connected)

MetPak Base Station has one external Sensor Input connection:

- Gill Wind Sensor via 10 Metre cable (RS422 connection)

It is important that the cable is appropriate for the chosen connection option. The following sections describe the recommended types and maximum lengths of cable in each case.

NOTE. A 15-metre, 6-pair cable (wires stripped at each end) suitable for RS232/RS422 or SDI-12 communication is available from Gill Instruments (Part No. 1723-10-053).

Cable Type

Wire type: 24AWG

Wire size: 7x32 AWG.

Cable outer diameter: 6-8mm (to match the hub box gland).

For RS422/485 operation the cable should contain twisted pairs screened to match the application.

The following table shows an example manufacturers' reference; other manufacturers' equivalents can be used.

Table 2 Recommended Belden cable types

Application	No. of Pairs	Belden Ref.
SDI-12 or RS485	2	9729
Digital RS232	3	9503
Digital RS422	4	9504
Multiple External Sensors	6	9506

Cable length

The maximum cable length is dependent on the chosen communication method.

The following table shows the maximum cable lengths for the supported communication protocols at the given baud rates, using the recommended cable. If any problems of data corruption etc. are experienced, then a slower baud rate should be used. Alternatively, a higher specification cable can be tried.

Table 3 Maximum cable lengths for supported communication and sensor network

Communication format	Baud rate	Max. cable length
RS232	19200	6.5M
RS422/485	19200	1000M
SDI-12	1200	90M

Cabling (unused wires)

Any unused wires in the connecting cables should be connected to ground preferably at the user equipment end.

Cabling protection

The Cable should be secured:

- With cable clamps or equivalent at regular intervals such that the hub box cable gland does not support the cable weight.
- Away from the mounting bolts to prevent chaffing of the cable.

NOTE. Install appropriate strain relief support to the cable. If possible, pass the cable through the mounting pole.

Earthing

To ensure correct operation and for maximum protection from lightning, a separate lightning rod system is recommended to protect the system.

You can also earth the MetPak Base Station through its mountings or by connecting a grounding cable (minimum of 6mm² copper wire) to a spare MetPak Base Station metalwork bolt hole. Clean off any paint that might prevent a good connection on the installation.

When you connect the communications cable ensure that the screen has a connection to the hub box case.

The Junction Box accessory and Heater Power Interface Box have a plastic case, hence ensure continuity of cable screens into and out of the boxes using the common earthing terminals provided in the boxes.

Routing Cables through the Hub Box Glands

NOTE: The MetPak Base Station Hub Box cable glands contain spring loaded metal leaves that are designed to make a ground contact with cables that have an overall braid screen. Care is therefore required when inserting and removing cables through the glands to prevent damage to the metal leaves.

2.2.4 Communication and Power Connections

To connect the MetPak Base Station Power and Communications cable:

1. Open MetPak Base Station's hub box by unfastening the four screws.
2. Locate connector J5 (see Figure 3). Carefully pull the connector off its circuit board pins.
3. Strip the cable wires to 8mm.
4. Pass the cable through one of the gland nuts (please refer to the 2nd NOTE on Page 8).
5. Connect your cable as shown in the following diagrams:
   - Gill USB Cable — Figure 4
   - RS232 — Figure 5
   - RS422 — Figure 6
   - RS485 — Figure 7
   - SDI-12 — Figure 8
6. Attach the cable's screen wires to the terminal post (see Figure 3).
7. After connection, securely tighten the gland nut to prevent moisture ingress.

NOTE. Ensure that MetPak Base Station is configured for the chosen communications method

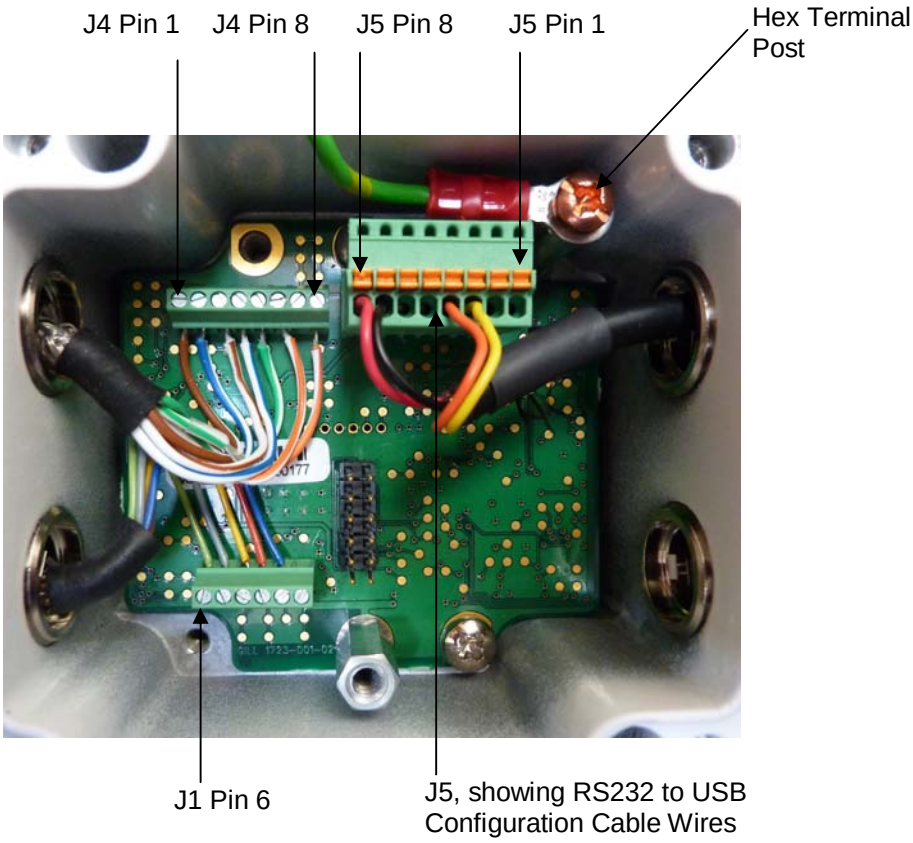
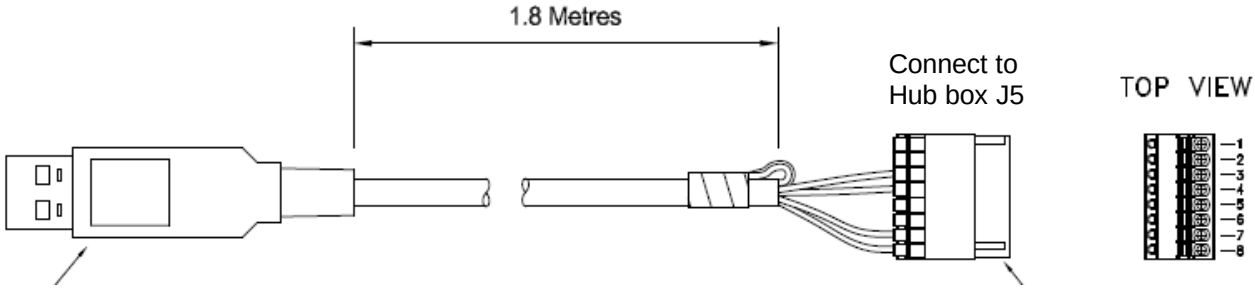


Figure 3 Internal view of the hub box (top circuit board removed).

USB Lead Connection (COMMS set for RS232)



Connect MetPak Base Station to a PC USB port using the Gill Configuration Cable 1723-10-051.

J5 Pin	1	2	3	4	5	6	7	8
Colour	None	None	Yellow	Orange	None	None	Black	Red

Figure 4 Connection of Gill USB Cable (Part No. 1723-10-051)

This USB cable can supply the necessary minimum 5v power for configuring a Base Station hub box and with a WindSonic/WindSonic M unit connected to the 10 Metre cable.

This USB cable cannot be used to power the Base Station with a WindObserver 70 or WindMaster/WindMaster Pro connected to the 10 Metre cable.

NOTE:- If upon connecting the USB lead to a PC the driver is not found by the PC, then the appropriate driver to match the PC Windows version may be downloaded from:-

http://www.ftdichip.com/Drivers/VCP.htm

NOTE. Ensure that MetPak Base Station 10 Metre cable is terminated before connecting the USB cable as sensor power is connected to the 10 Metre cable pins.

Digital Output RS232 Connections (COMMS set for RS232)

This is the MetPak Base Station default communication configuration setting.

J5 Hub Box 8 Way Push fit Block			PC 9 Way D Type Connector	
Signal names	**Terminal Nos.**	**3 Pair Cable**	**Pin No's**	**Signal Names**
RS232 TX	3	→	2	RXD
RS232 RX	4	←	3	TXD
Signal Ground	2		5	Sig Gnd
Chasis Ground	Terminal Post	Screen wires	NA	Chassis Ground
Supply –ve	7	←	–	DC Power
Supply +ve	8	←	+	supply

NOTE. Ensure that MetPak Base Station 10 Metre cable is terminated before connecting dc power as sensor power is connected to the 10 Metre cable

Figure 5 RS232 connections

Digital Output RS422 Connections (COMMS set for RS422)

This is not the default communications setting; ensure the MetPak Base Station has been configured for this output requirement before wiring to a user device.

J5 Hub Box 8 Way Push fit Block			RS422 to RS232 or USB Converter
Signal Names	**Terminal Nos.**	**4 Pair Cable**	**Signal Names**
RS422 TX +	6	→	RX +
RS422 TX –	3	→	RX –
RS422 RX +	5	←	TX +
RS422 RX –	4	←	TX –
Signal Ground	2	→	Signal Ground
Chassis Ground	Terminal Post	Screen wires	Chassis Ground
Supply –ve	7	←	– DC Power Supply
Supply +ve	8	←	+

NOTE. Ensure that MetPak Base Station 10 Metre cable is terminated before connecting the DC power supply as sensor power is connected to the 10 Metre cable.

Figure 6 RS422 connections

Digital Output RS485S 2 Wire Point to Point Connections (COMMS set for RS485P2W)

This is not the default communications setting; ensure the MetPak Base Station has been configured for this output requirement before wiring to a user device.

Note that it is not possible to network other devices on this 2-wire RS485 link.

J5 Hub Box 8 Way Push fit Block			RS485 to RS232 or USB Converter
Signal Names	**Terminal Nos.**	**2 Pair Cable**	**Signal Names**
RS485 TX +	6	→	RS485TX/RX+
RS485 RX+	5		
RS485 TX –	3	→	RS485TX/RX–
RS485 RX –	4		
Signal Ground	2	→	Signal Ground
Chassis Ground	Terminal Post	Screen wires	Chassis ground
Supply -ve	7	←	– DC Power Supply
Supply +ve	8	←	+

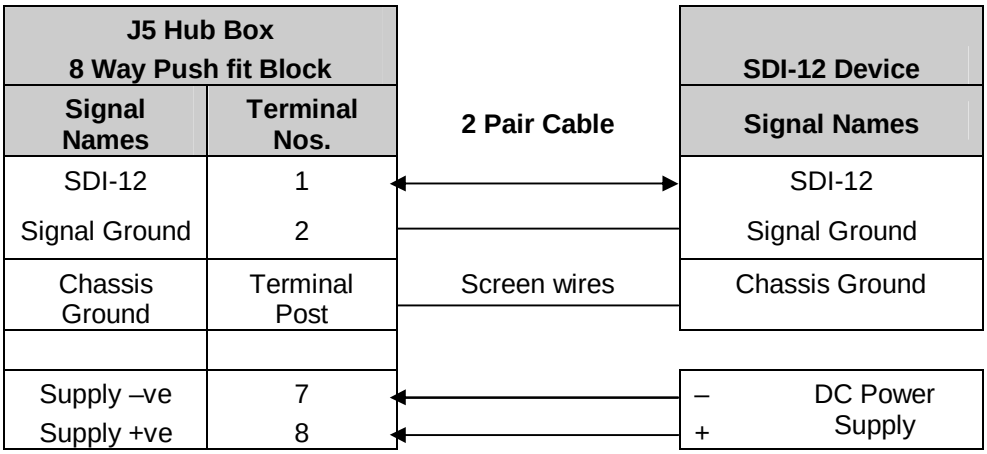
NOTE. Ensure that MetPak Base Station 10 Metre cable is terminated before connecting the DC power supply as sensor power is connected to the 10 Metre cable.

Figure 7 RS485 Connections

Digital Output SDI-12 Connections (COMMS set for SDI12)

This is not the default communications setting; ensure the MetPak Base Station has been configured for this output requirement before wiring to a user device.

(Note SD-12 communications is not applicable with a 3 axis sensor connected to the Base station).

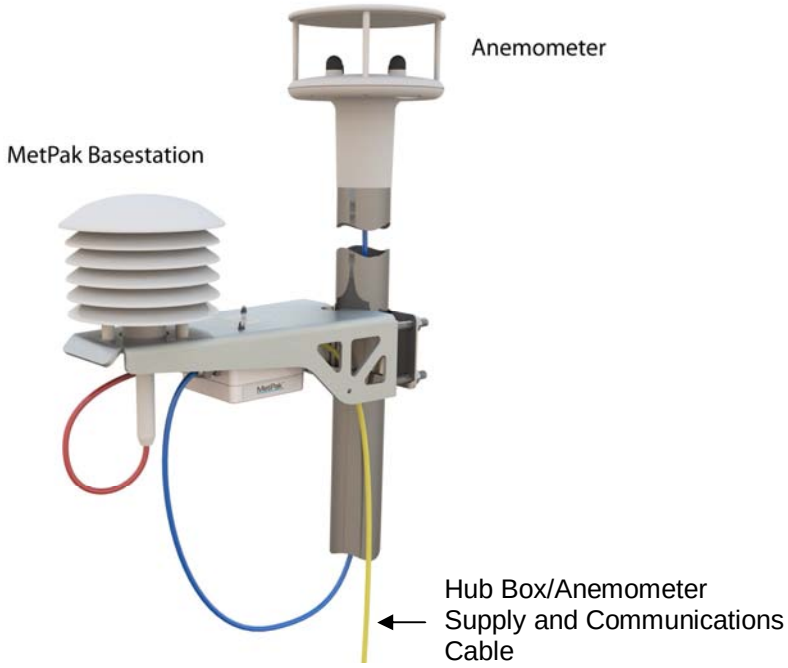


NOTE. Ensure that MetPak Base Station 10 Metre cable is terminated before connecting the DC power supply as sensor power is connected to the 10 Metre cable.

Figure 8 SDI-12 connections

2.2.5 MetPak Base Station System Connections

A typical Non Heated MetPak Base Station system might look like the following illustration.



A typical Heated MetPak Base Station system might look like the following illustration.

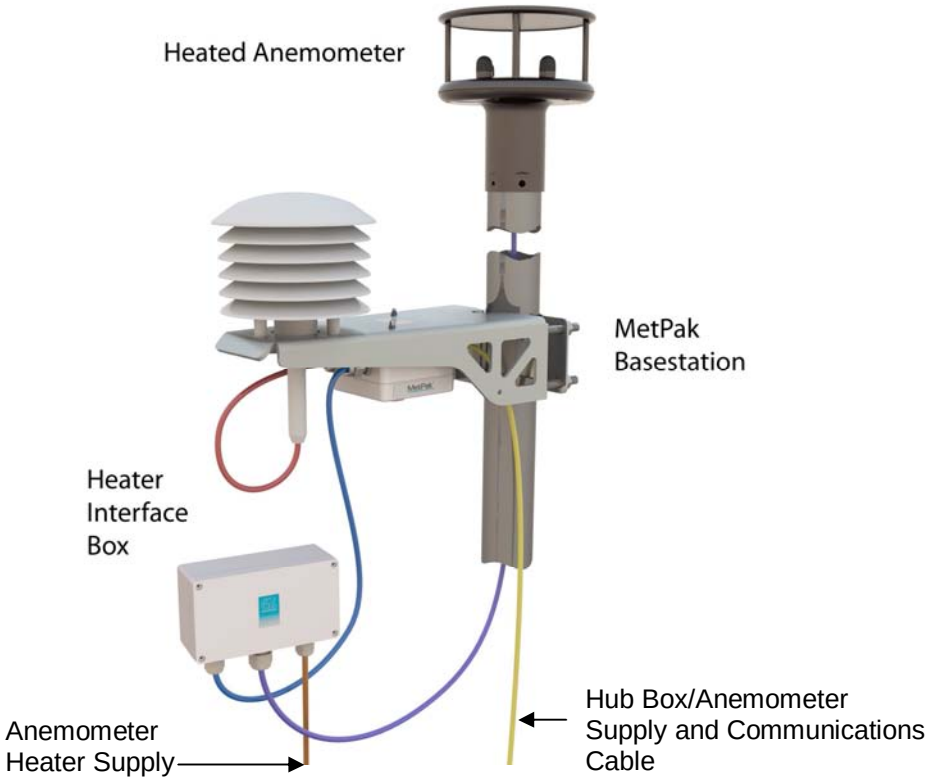


Figure 9 MetPak Base Station Example System Pictures

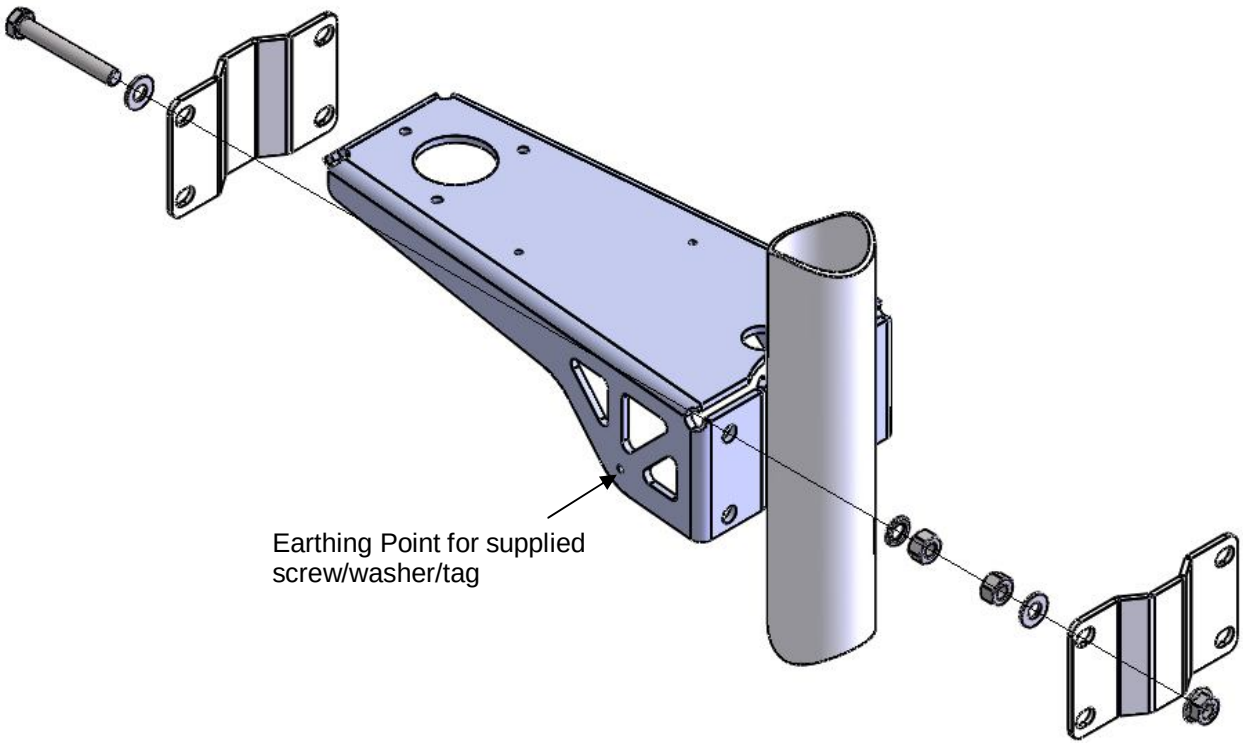
2.2.6 Mounting MetPak Base Station

MetPak Base Station uses a mounting clamp suitable for attaching to a vertical pipe with a diameter of 30-58mm. When mounting the MetPak Base Station, consider the position, orientation and alignment of the unit.

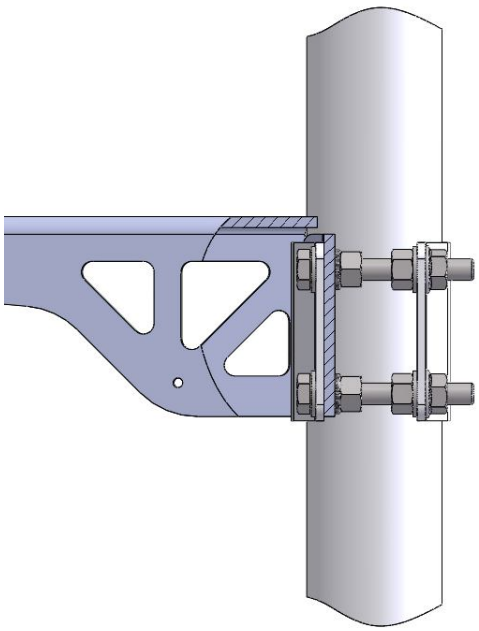
Note that the mounting pipe should first be degreased and when assembling the MetPak Base Station clamp assembly the outer clamp nuts need to be tightened evenly to a torque figure of 3 Nm.

The moving plate part of the clamp needs to be reversed for poles below 38 mm diameter.

Mounting Bracket Assembly Exploded View



Mounting Bracket Assembled View



Position

It is the responsibility of the customer to ensure that the MetPak Base Station is mounted in a position clear of any structure, including the mounting post, which may obstruct the airflow or induce turbulence.

Orientation

Normally, the MetPak Base Station is mounted on a vertical pole, ensuring a horizontal Measuring Plane, (see Figure 10).

For indoor use the unit may be mounted with the Measurement Plane set to any required orientation.

Alignment

The MetPak Base Station Wind Sensor should be aligned to point to North, or any other reference direction – for example, the bow of a boat.

Note. It is usually simpler to work first with a compass at ground level and identify a suitable landmark and its bearing.

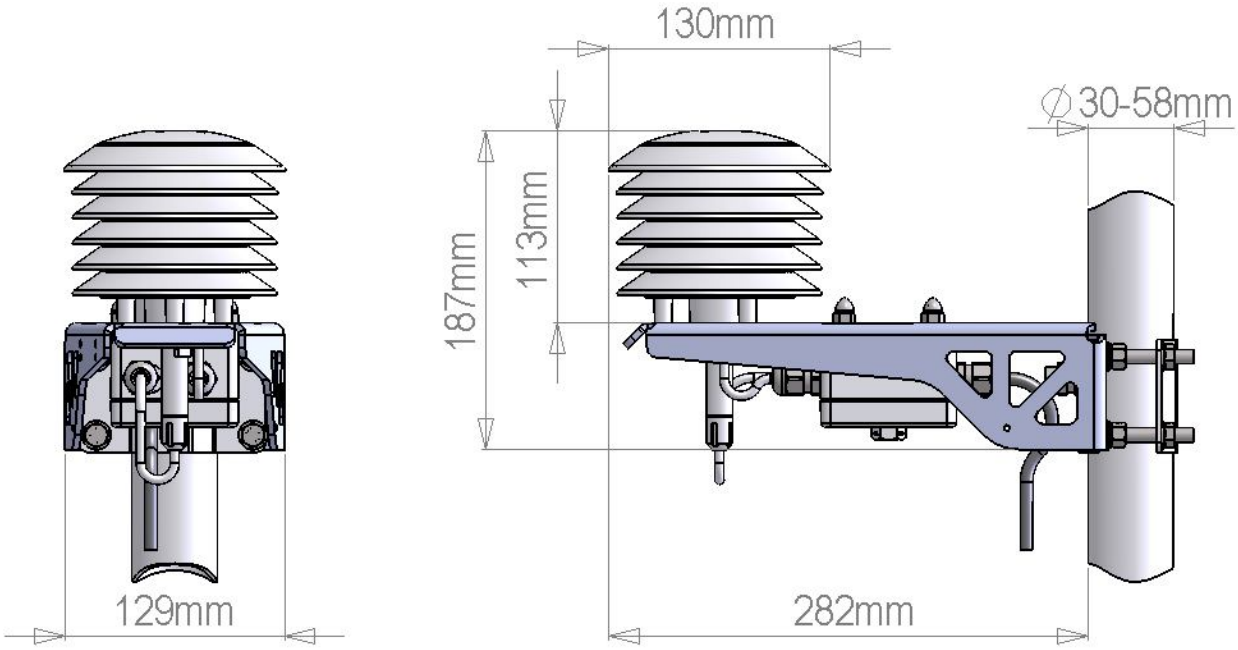


Figure 10 Mounting and Dimensions for MetPak Base Station

Interference

Always check the installation to ensure the MetPak Base Station and Wind sensor is not affected by other equipment operating locally, which may not conform to current standards, e.g. radio/radar transmitters, boat engines, generators etc.

See Para 2.1 for guideline details.

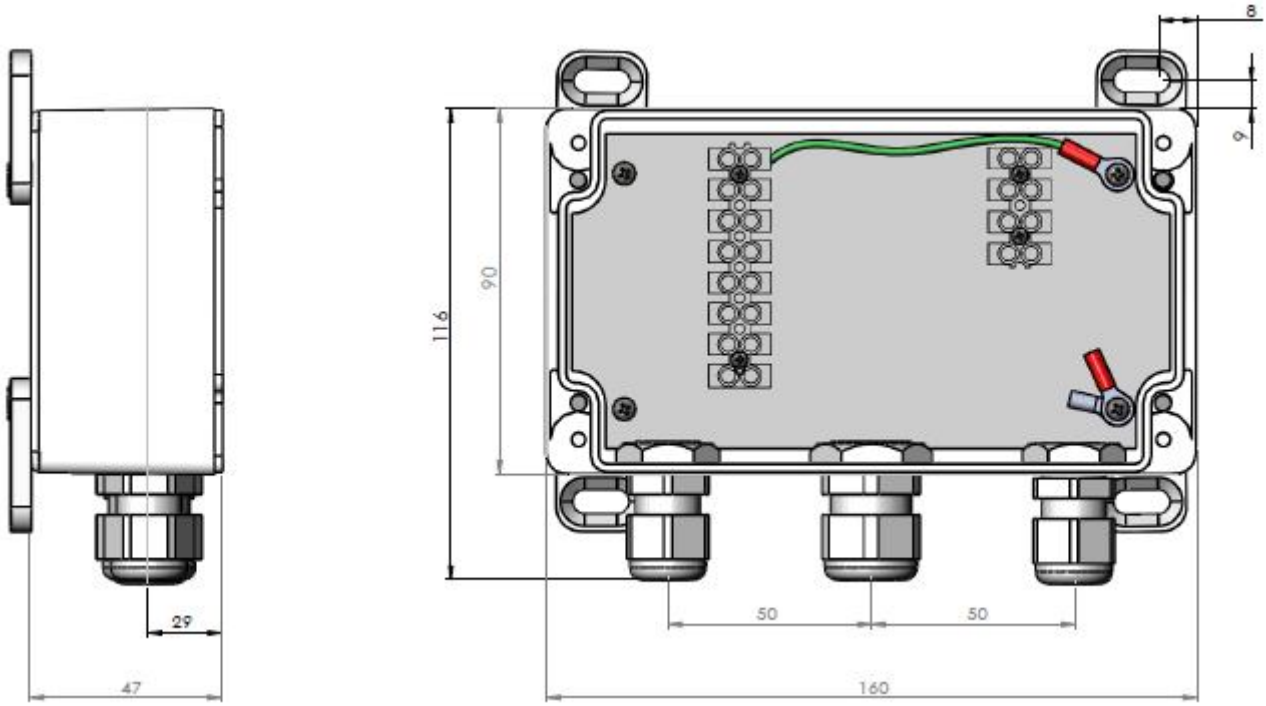
CAUTION. Do NOT mount the MetPak Base Station and Wind Sensor in close proximity to high-powered radar or radio transmitters. A site survey may be required if there is any doubt about the strength of external electrical noise.

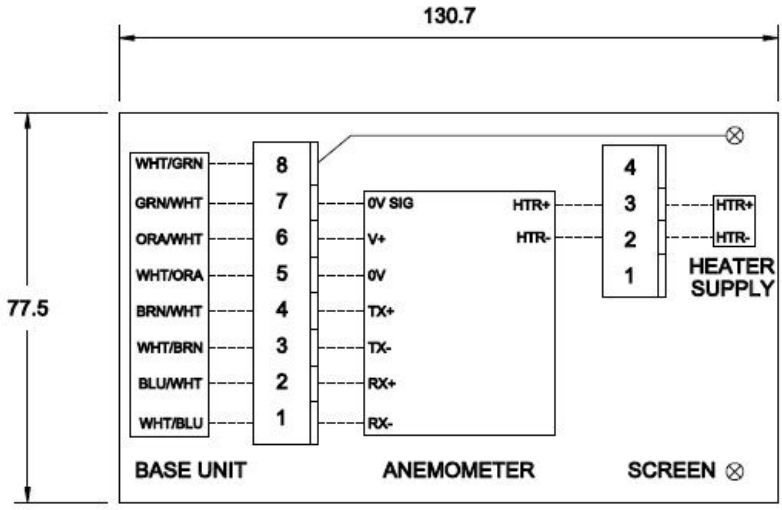
2.2.7 Mounting MetPak Base Station Heater Power Interface Box (Optional Item)

This Interface box is an optional extra for orders for:-

MetPak Base Station 1723-1A-3-211 (with Heated WindSonic M).

MetPak Base Station 1723-1A-4-311 (with Enhanced Heated WindObserver 70).





3. Operation

This section provides an overview of the operation of the MetPak Base Station. For more detailed information about any of the steps, use the references to other sections of this manual.

3.1 Start Guide

1. Decide how you are going to connect MetPak Base Station to your PC or communications network. MetPak Base Station supports the following options:

   - USB connection using Gill's RS232 to USB 1.8M configuration cable (includes integral 5V power supply for WindSonic connections only) compatible with MetSet. To order, contact your dealer quoting part number: 1723-10-051).

     NOTE. You could use an equivalent RS232-USB adapter such as EasySynch RS232 to USB adaptor.

   - RS232 connection using standard cable and PC COM port. Separate 12V to 30V dc power supply also required (compatible with MetSet).
   - RS422 using RS232 converter (compatible with MetSet).
   - RS485 2 wire point to point (not compatible with MetSet).
   - SDI-12 connection (note SDI-12 is not compatible with MetSet Software).

     NOTE. MetPak Base Station is pre-configured for RS232 communication (factory setting). If you want to use an alternative communication protocol, you will need to set up the unit using an RS232 connection (with an appropriately wired cable), change the setting, shut the unit down, attach a cable for the new communication type, and then restart the unit.

2. Check that you have the following:

   - MetPak Base Station unit (Part No.1723-1A-X-111).
   - A suitable Gill Wind Sensor (See page 6).
   - Gill MetView and MetSet Software and Manual supplied on the CD.

   If any parts are missing, please contact your dealer.

3. Connect the 10 Metre RS422 cable to the appropriate Wind Sensor connector and Wind Sensor or Heater Power Interface Box and Wind Sensor.
4. Open the Base Station hub box by unfastening the four retaining screws. Locate the connector: J5 (see Page 9, Figure 3). Carefully pull the connector block from its pins.
5. Prepare the communications cable by stripping the wires to a length of 8mm. Feed the prepared cable through one of the two available ports on the side of the connection box (please refer to the 2nd NOTE on Page 8).

6. Connect the cable to J5 as described on page 10 for your chosen communications method.
7. Carefully press J5 onto its circuit board pins.
8. If connecting Analogue inputs, the Digital Input or a PRT strip cable wires and connect to respective connectors J9, J8 and J7 in the hub box.
9. Tighten the gland on the connection ports to seal the cables in place. Replace the top on the connection box.
10. If you are carrying out a bench test, continue to step 17. When you have finished testing, return to Step 13.
11. Ensure that if you are using a mounting pole that it has been degreased in the area where the MetPak Base Station will be positioned.
12. Position the MetPak Base Station against the mounting post (see page 22), replace the mounting bracket and tighten sufficiently to hold the unit in place but allowing it to be rotated or moved up and down the pole.
13. Install the Wind Sensor in accordance with the appropriate Wind Sensor manual
14. Check the Wind Sensor orientation and alignment of the unit instructed in the Wind sensor Manual.
15. Check the height of the Wind Sensor and MetPak Base Station and ensure that they are clear of any obstructions, including the mounting post that could interfere with their measurements.
16. Tighten the MetPak Base Station mounting bracket nuts evenly to a torque of 3Nm to hold the unit firmly in place.
17. Connect the communications cable to your PC or network device.
18. Place the MetPak Base Station CD in your PC's CD drive and install MetSet and MetView.

3.2 MetView

MetView Software allows you to view the MetPak Base Station data graphically and has a simple data logging facility.

Before you can use MetView, check that MetPak Base Station is correctly connected to a Serial COM port or USB COM port on your PC.

NOTE: MetView is compatible with RS232 and RS422 connected units only.

3.2.1 Opening MetView

Click on the MetView button on your PC's desktop or choose:

Start > Programs > MetView > MetView

The MetView Control Centre window is displayed

Scan Button– If MetPak Base Station transmit and receive wires are connected to the PC then use the Scan button to connect to MetView.

Connection is Receive Only Tick Box – Use if the MetPak Base Station connection to the PC has only transmit wires connected and a MetSet version of its current device settings is available to upload to MetView. Select 'Connection is Receive only' tick box and click on the Scan button. Upload a MetSet generated Device file from a PC location as directed.

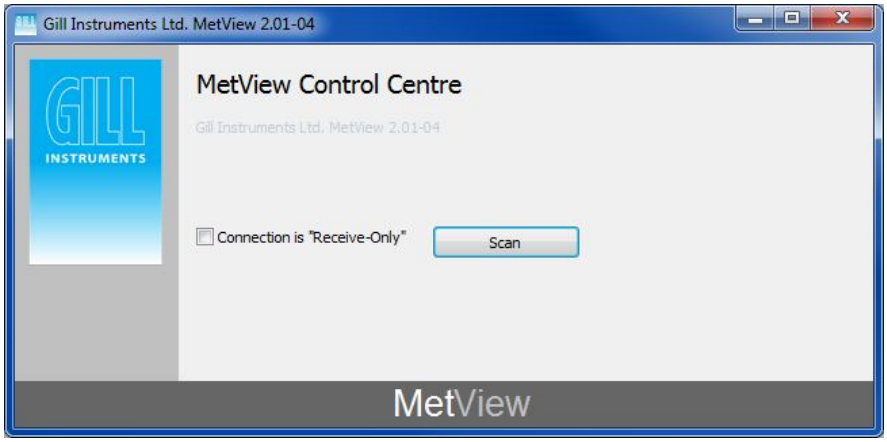


Figure 11 Opening MetView Screen

3.2.2 Scanning for Devices

To set up communicate between MetView and a connected MetPak Base Station:

1. Click on the **Scan** button to search the available COM ports for MetPak Base Station devices.

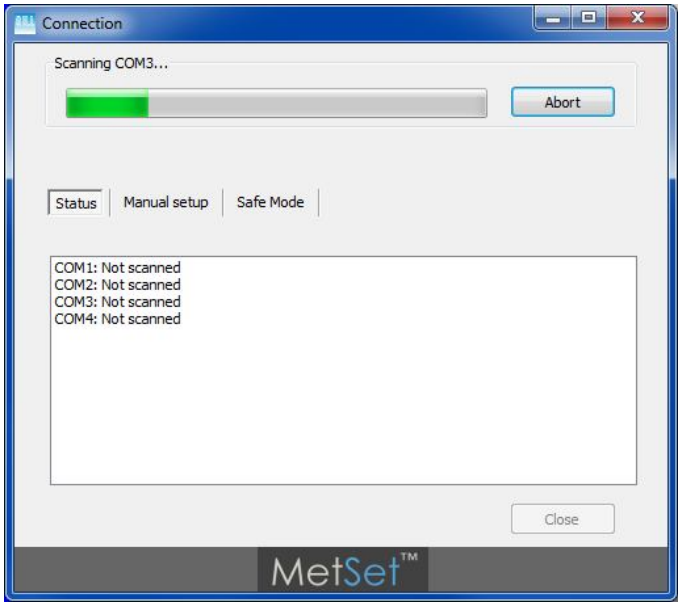


Figure 12 Scanning for MetPak Base Station Devices

When a device is found, MetView obtains the MetPak Base Station configuration settings and then retrieves and displays MetPak Base Station data.

3.2.3 The MetView Console

When connected correctly, MetView displays its data-monitoring console. This consists of gauges showing: Wind Direction, Wind Speed, Pressure, Humidity, Temperature, PRT. There is also a digital readout of Dew Point. Buttons beneath each of the gauges allow you to choose the displayed units and other options. Each gauge also shows the maximum and minimum values recorded during the current session. The wind speed gauge also shows the maximum gust speed.

Note: MetView will not show data if the unit is set for SDI-12 format.

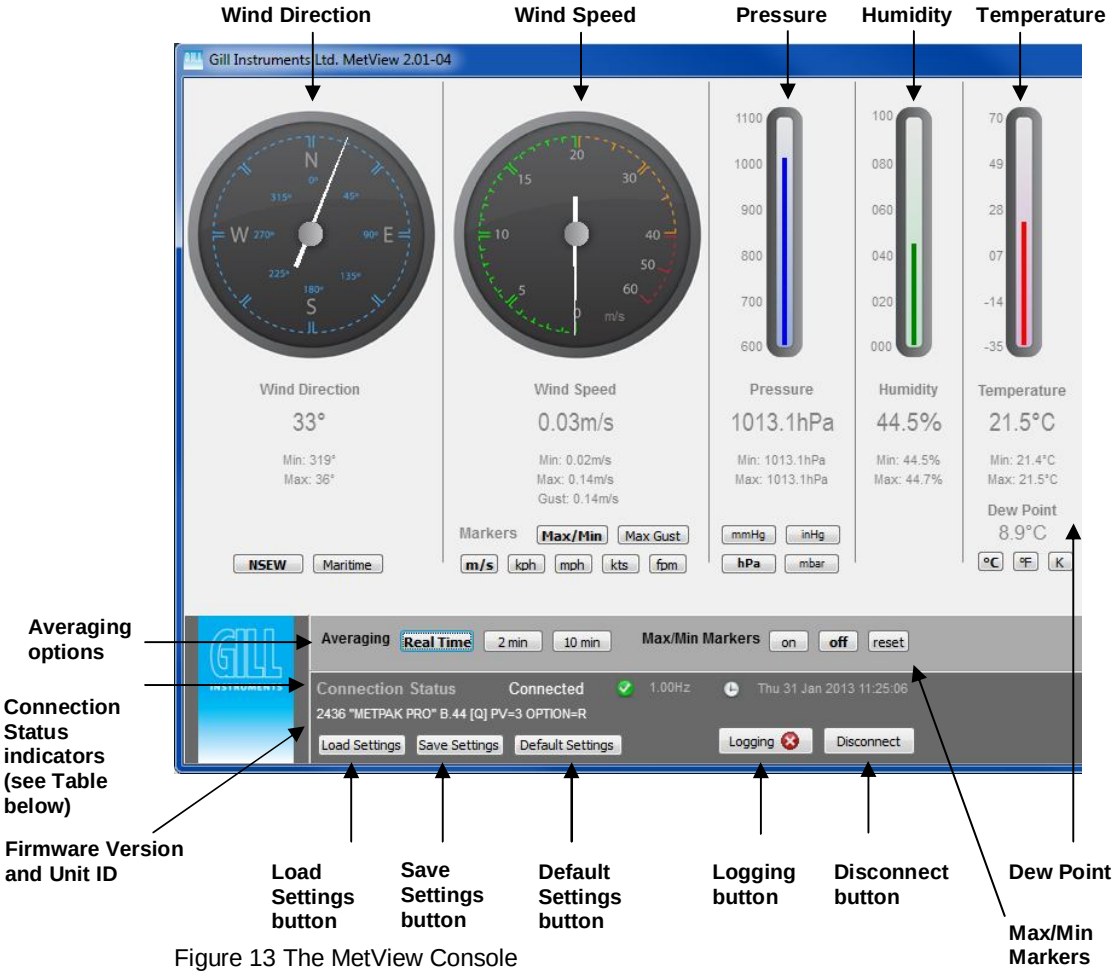


Figure 13 The MetView Console

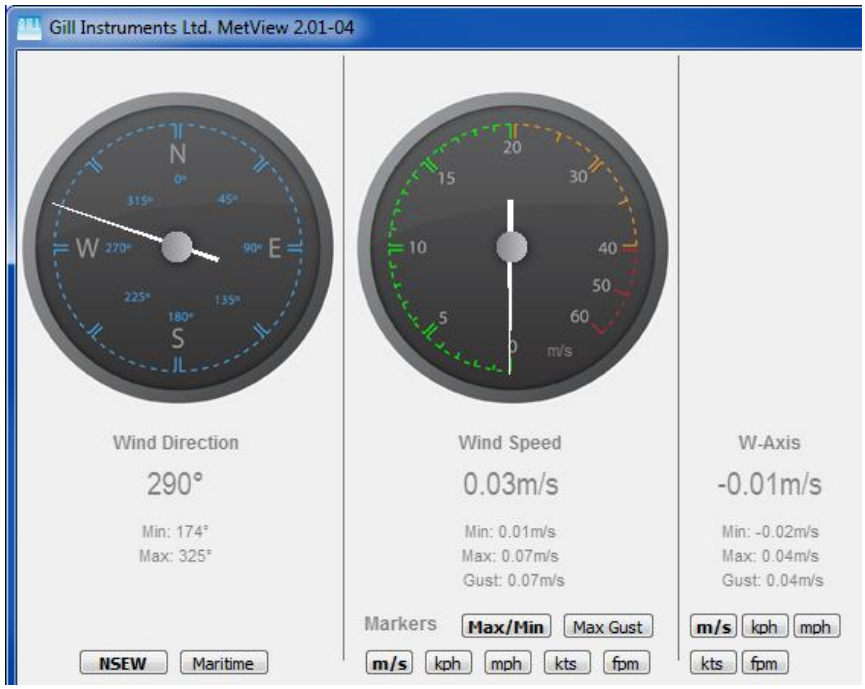
Connection Status

Table 4 Connection status indicators

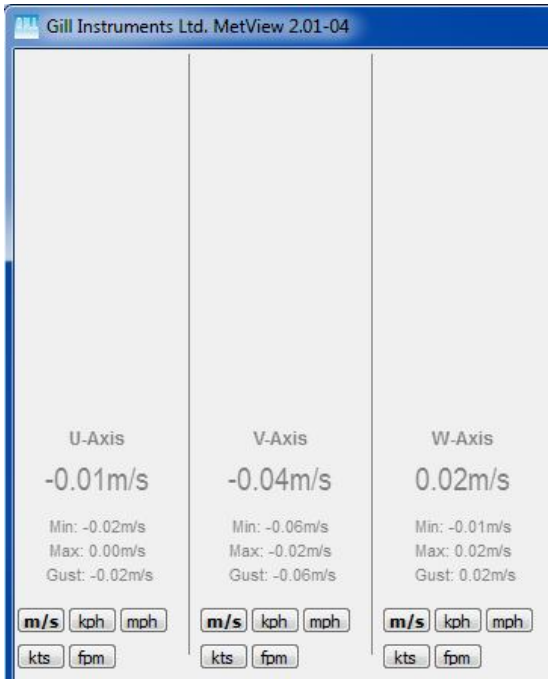
Reading	Function
Green Background Tick	Indicates MetPak Base Station logging or communicating correctly with MetView along with reading the MetPak Base Station firmware version.
Red Background Cross	Indicates MetPak Base Station not logging or connected/communicating to MetView.
1.00Hz	Indicates the output rate of the MetPak Base Station when connected. Reads when the unit is communicating correctly with MetView.
Thu 31 Jan 2013 11:25:06	Real Time PC date and time indication.

If the MetPak Base Station has been purchased configured for WindMaster or WindMaster Pro operation MetSet can be used to set the Wind Data output string to read in Polar and W or U, V and W output. When MetView reads the 3 axis Wind data it will either be displayed in Polar and W or U, V and W format as follows:- Note MetView cannot switch between Polar and U, V and W displays.

3 Axis Polar and W Wind Display



3 Axis U, V and W Wind Display



Note. The order in which the instruments are shown in the MetView display reflects the order in which the instrument data appears in the MetPak Base Station data string.

3.2.4 MetView Console Display Options

MetView Console buttons can convert data from the MetPak Base Station to read different units or scale settings. This does not alter the actual MetPak Base Station configuration.

Units shown in **bold** denote default settings

Table 5 MetView scale and unit options

Gauge	Function
Wind Direction	Use buttons to choose from two display styles: **NSEW** or Maritime
Wind Speed Markers	Use buttons to add markers on the gauge for **Max/Min** or Max Gust.
Wind Speed	Use buttons to choose from five wind speed units: **m/s**, kph, mph, kts, fpm
Pressure	Use buttons to choose from pressure scales: **hPa**, mbar, inHg, mmHg
Humidity	Displays Max and Min values during current session in **%**
Temperature & Dew Point	Use buttons to choose from three temperature scales: **°C**, °F, K

Table 6 MetView averaging options

Setting	Function
Real Time	Choose this button for no averaging
2 Min	Select for 2 minute rolling average of all sensor readings except DIG1
10Min	Select for 10 minute rolling average of all sensor readings except DIG1

Table 7 Max/min markers

Setting	Function
Off	Maximum and Minimum Markers on all gauges turned off
On	Maximum and Minimum Markers on all gauges turned on
Reset	Reset all Gauge Maximum/Minimum Markers and all digital Maximum/Minimum reading at will

Table 8 MetView Screen Settings Options

Setting	Function
Save Settings	Will Save all the current MetView screen settings to a file for later retrieval if required.
Load Settings	Will load and update the MetView screen with a previously saved setting.
Default Settings	Will return all MetView screen settings to factory default.

3.2.5 MetView Gauge Ranges and Graphs

Gauge Range Settings.

MetView Pressure, Humidity, Temperature Gauge ranges may be altered to view changes in conditions more visibly.

Note, these changes only affect MetView settings and do not affect the MetPak Base Station output.

For instance if the typical temperature measurement range required is from +10 degrees to +40 deg C then the temperature gauge range can be adjusted to reflect this.

Place the mouse pointer over the Temperature display gauge and double click to bring up the Set Gauge Range screen. Change Max and Min readings to required values, e.g. +10 min and +40 max.

Click on Set.

The Temperature gauge range will be updated to reflect the change.

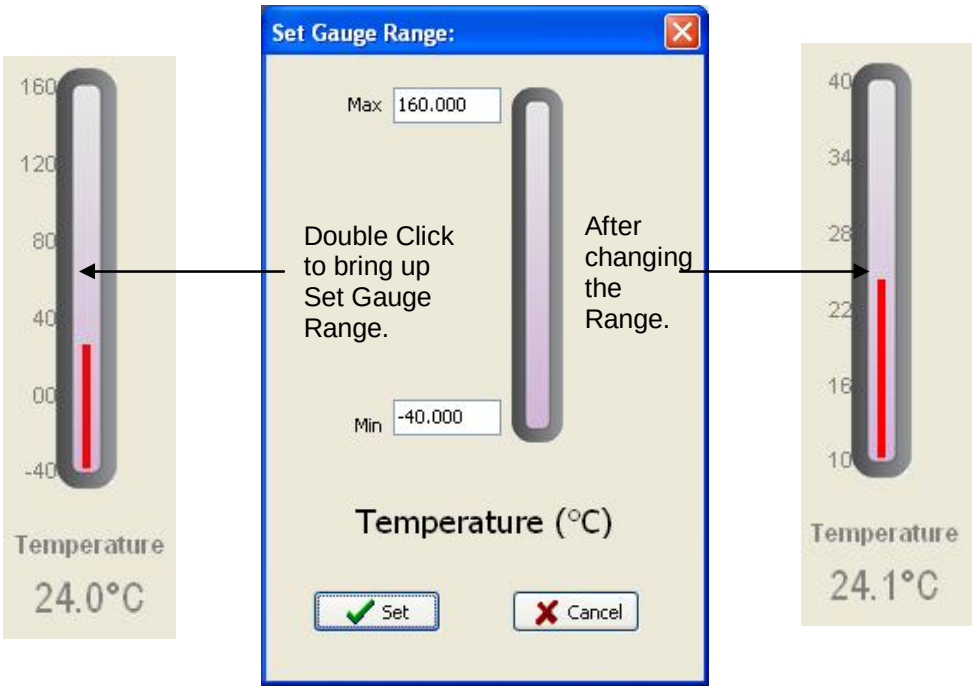


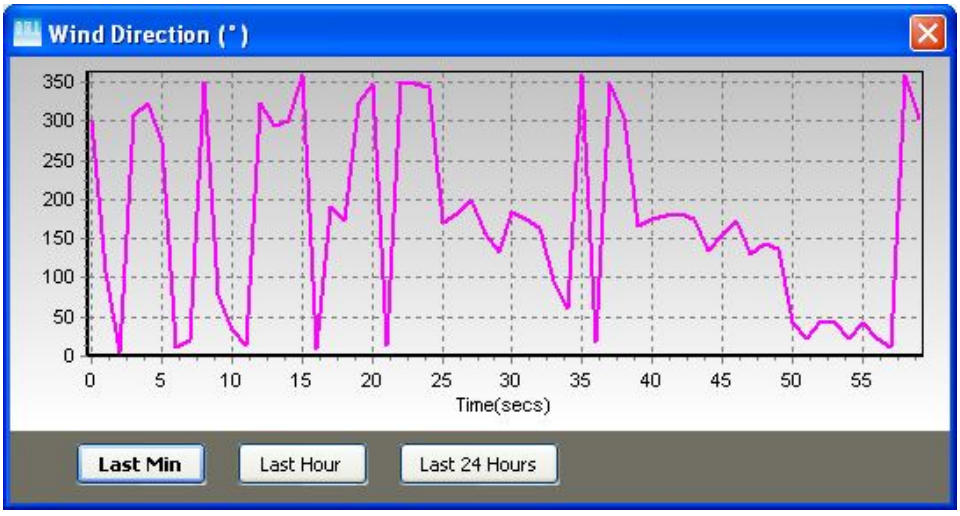
Figure 14 MetView Gauge Range

Graphs

MetView allows data detected over the last minute, last 1 hour and last 24 hours to be accessed and shown on a graph.

Note. Data is only shown up to the time when the graph function is selected; the graph is not updated once opened. Data is collected from the time that MetView is opened and reading data from a MetPak Base Station.

Double Click on the reading to bring up the graph.



Click on the Last Min, Last Hour or Last 24 Hours buttons as required to view data.

Figure 15 MetView Graph

3.2.6 Data logging

NOTE. MetView logs data based on the MetPak Base Station configuration not on the MetView console settings.

To log MetPak Base Station data, click on the **Logging** button on the MetView console. The *Logging* dialog box is displayed.

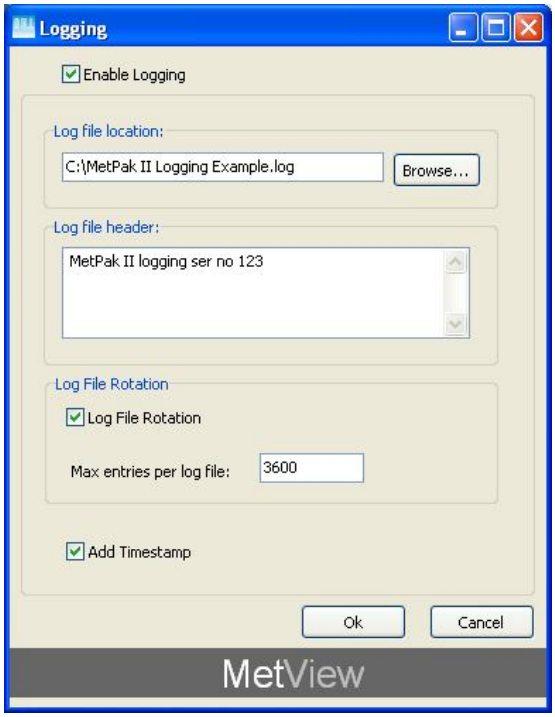


Figure 16 Setting up data logging

Setting up a logging file

1. Select **Enable Logging** to start logging to a file.
2. Identify the name and location for the logging file:

   Log File location Click on the **Browse** button to identify the folder where you want to store the data file. Enter the name of the file.

   Log file header if required type some notes on the data that is to be recorded which will appear at the top of the saved data log file.

3. Choose from the following additional options:

   Log File Rotation Set up segmented logging with each logged file length determined by the number entered in the text box below. The figure 3600, for example, means that each log file length will be 3600 lines of data. Maximum entries per log file is limited to 65535 and a maximum of 2048 log files can be created.

   Add Timestamp Adds the date and time to the logged data file taken from the PC clock.

To start logging

1. Check that the **Enable Logging** option is selected.
2. Click on the **OK** button to commence logging and return to the console.

Note. To show that data is being recorded, the Logging button's icon changes to a green tick:

Logging active

Logging stopped

To stop logging

To turn off logging:

1. Click on the **Logging** button on the MetView console. Clear the **Enable Logging** check box.
2. Click on the **OK** button. If logging has stopped, the Logging button shows a red background cross instead of the green background tick (see above).

Understanding Logged Data

Logged data is stored to a file with a **.log** extension. This can be viewed in any text/HTML editor or spreadsheet application.

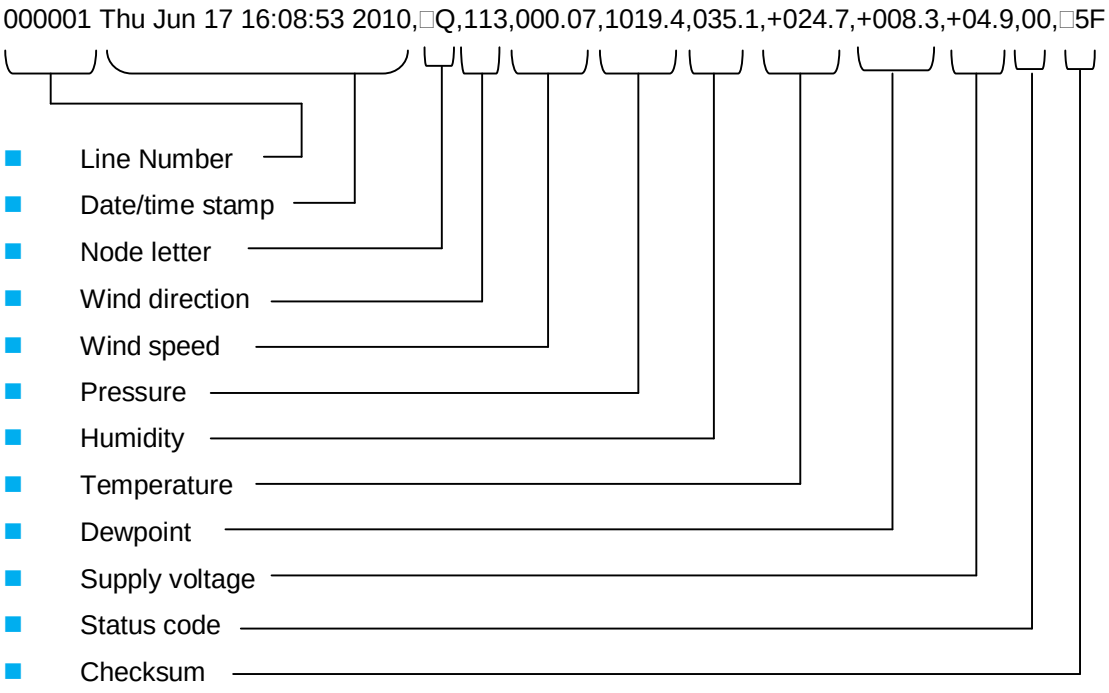
MetView Test log V0.19 Firmware00000.log - Notepad

File Edit Format View Help

```
Test Data String log V0.19 firmware
000000,Thu Jun 17 16:08:51 2010,  DQ,128,000.07,1019.4,035.1,+024.7,+008.3,+04.9,00,057
000001,Thu Jun 17 16:08:53 2010,  DQ,113,000.07,1019.4,035.1,+024.7,+008.3,+04.9,00,05F
000002,Thu Jun 17 16:08:54 2010,  DQ,151,000.05,1019.4,035.1,+024.7,+008.3,+04.9,00,05B
000003,Thu Jun 17 16:08:55 2010,  DQ,148,000.06,1019.4,035.1,+024.7,+008.3,+04.9,00,050
000004,Thu Jun 17 16:08:56 2010,  DQ,169,000.06,1019.4,035.1,+024.7,+008.3,+04.9,00,053
000005,Thu Jun 17 16:08:57 2010,  DQ,160,000.05,1019.4,035.0,+024.7,+008.3,+04.9,00,058
000006,Thu Jun 17 16:08:58 2010,  DQ,132,000.05,1019.4,035.0,+024.7,+008.3,+04.9,00,05F
000007,Thu Jun 17 16:08:59 2010,  DQ,156,000.05,1019.5,035.0,+024.7,+008.3,+04.9,00,05C
000008,Thu Jun 17 16:09:00 2010,  DQ,139,000.03,1019.5,035.0,+024.7,+008.3,+04.9,00,053
000009,Thu Jun 17 16:09:01 2010,  DQ,123,000.02,1019.4,035.0,+024.7,+008.3,+04.9,00,058
000010,Thu Jun 17 16:09:02 2010,  DQ,116,000.01,1019.5,035.0,+024.7,+008.3,+04.9,00,05C
000011,Thu Jun 17 16:09:03 2010,  DQ,205,000.03,1019.5,035.0,+024.7,+008.3,+04.9,00,05F
000012,Thu Jun 17 16:09:04 2010,  DQ,201,000.07,1019.4,035.0,+024.7,+008.3,+04.9,00,05E
000013,Thu Jun 17 16:09:05 2010,  DQ,175,000.07,1019.4,035.0,+024.7,+008.3,+04.9,00,05E
000014,Thu Jun 17 16:09:06 2010,  DQ,170,000.08,1019.5,035.0,+024.7,+008.3,+04.9,00,055
```

Figure 19 A typical 2 Axis data log (viewed in Windows Notepad)

Each entry in the default reporting order consists of the following (2 axis data illustrated):



3.3 MetPak Base Station Configuration

MetPak Base Station can be configured using:-

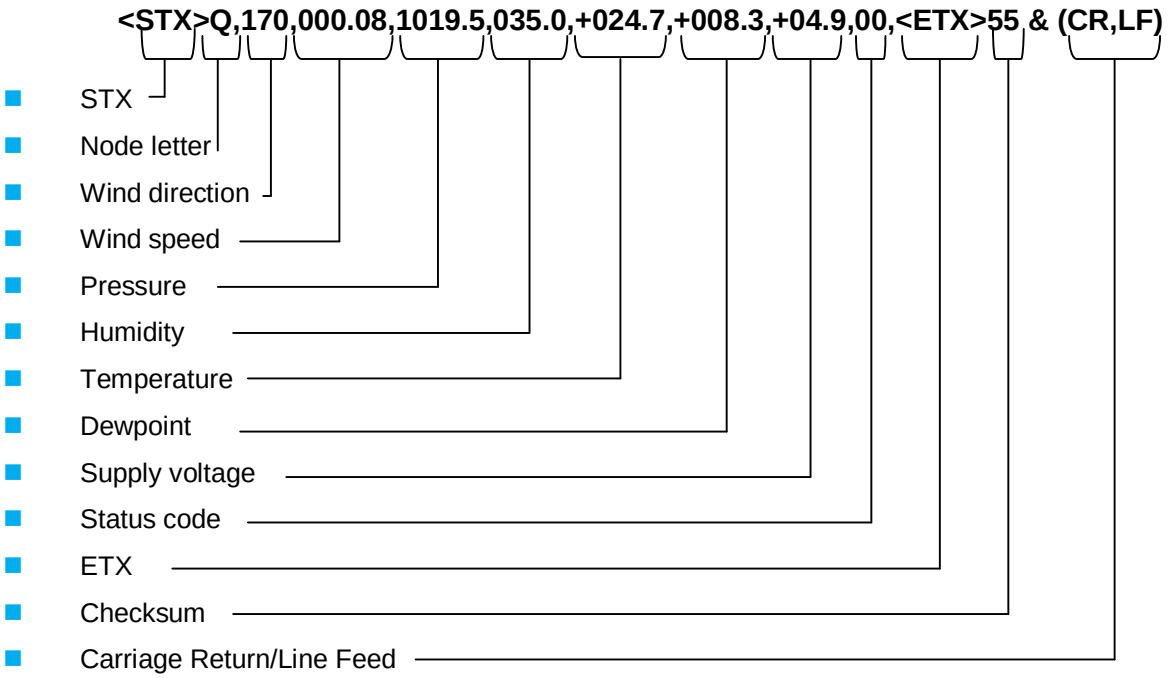
- Gill MetSet or a terminal program such as Windows HyperTerminal.
- Gill Wind software used as a Terminal Program only.

The default configuration settings are listed in the following table.

Table 9 Default configuration settings

Setting	Function
Comms Levels	RS232
Baud Rate	19200
Data Connection	Data Bits 8, Parity None, Stop Bits 1, Flow Control None.
Node ID	Q
Output rate	1Hz
Message Mode	Continuous
ASCII Set Up	Carriage return and line feed, Echo on
North Alignment	0
Sensor WindSpeed	On
Wind Speed Units	MS (Metres/Second)
Temperature Sensor	On
Temperature Units	C (Degrees Celsius)
Dewpoint Sensor	On
Dewpoint Units	C (Degrees Celsius)
Pressure Sensor	On
Pressure Units	Hecto Pascals
Humidity Sensor	On
Humidity Units	%
Report Format	Node, Polar (Wind Direction and Wind Speed), Pressure, Humidity, Temperature, Dewpoint, Volts, Status, Checksum.
Status Message Output	On
Report Message Output	On
Units Message Output	On
Inputs Message Output	On
Output Sentence	Comma Separated Variable

Example Default 2 Axis Data String:



NOTES:

<STX> is the Start of String character (ASCII value 2).

<ETX> is the End of String character (ASCII value 3).

Checksum, the 2 digit Hex Checksum sum figure is calculated from the Exclusive OR of the bytes between (and not including) the STX and ETX characters.

Example MetPak Base Station Data String:

With 2 Axis wind sensor

┐ Q,249,000.01,1017.3,049.2,+021.4,+010.3,+11.6,00,└ 7C

With 3 Axis wind Sensor

MetSet is used to set 3 axis wind readings for Wind Direction and Speed (Polar) and W readings.

┐ Q,249,000.03,+000.02,1013.5,042.9,+022.0,+008.8,+11.6,00,└ 50

MetSet is used to set 3 axis wind readings for U, V and W readings.

┐ Q,+000.01,-000.02,+000.00,1013.4,043.0,+022.1,+009.0,+11.6,00,└ 74

NOTE. Switch on Time. Upon switching on the MetPak Base Station, allow 9.5 seconds to elapse before data is output. If powering Wind Sensors separately then take individual sensor start up times into consideration.

3.4 Configuring MetPak Base Station with MetSet

Before you use MetSet check that MetPak Base Station is correctly connected to a Serial COM port or USB COM port on your PC.

NOTE: MetSet is compatible with RS232 and RS422 connected units only.

3.4.1 Opening MetSet

Click on the MetSet button on your PC's desktop or choose:

Start > All Programs > MetSet > MetSet

The MetSet Control Centre window is displayed. If you have more than one MetPak Base Station connected to your PC, MetSet, by default, selects the first device detected.

For most applications it is recommended to click on the MetSet **Connect and Read** button.

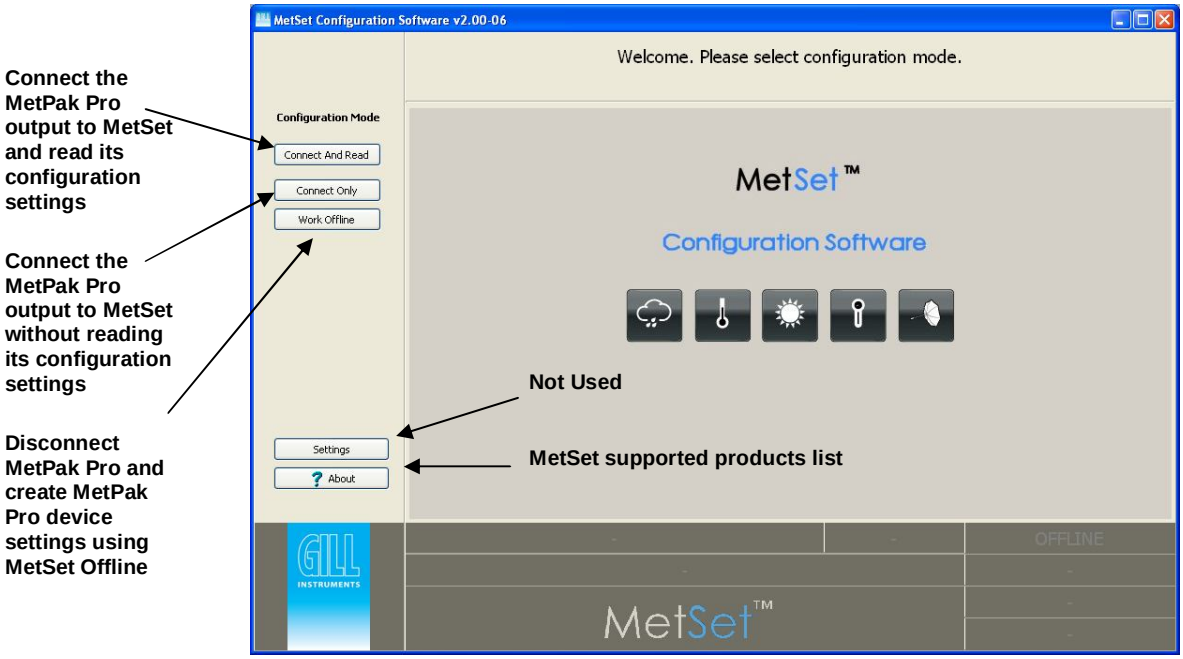


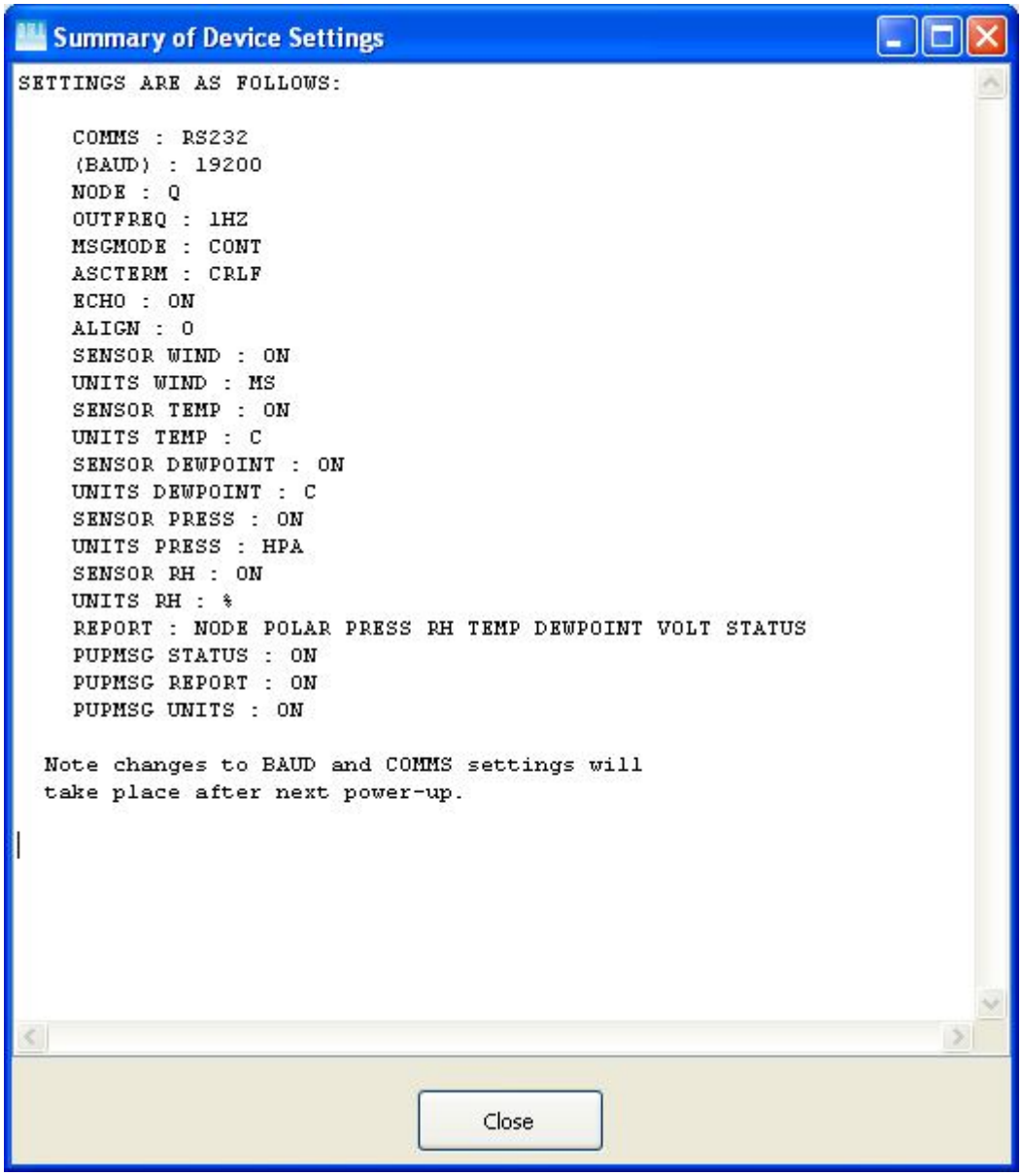
Figure 17 Opening MetSet Screen

MetSet interrogates the MetPak Base Station and returns a summary of the device settings.

Note that MetSet also saves a copy of this screen to the connected PC as a Session Report File that can be accessed from the following destination.

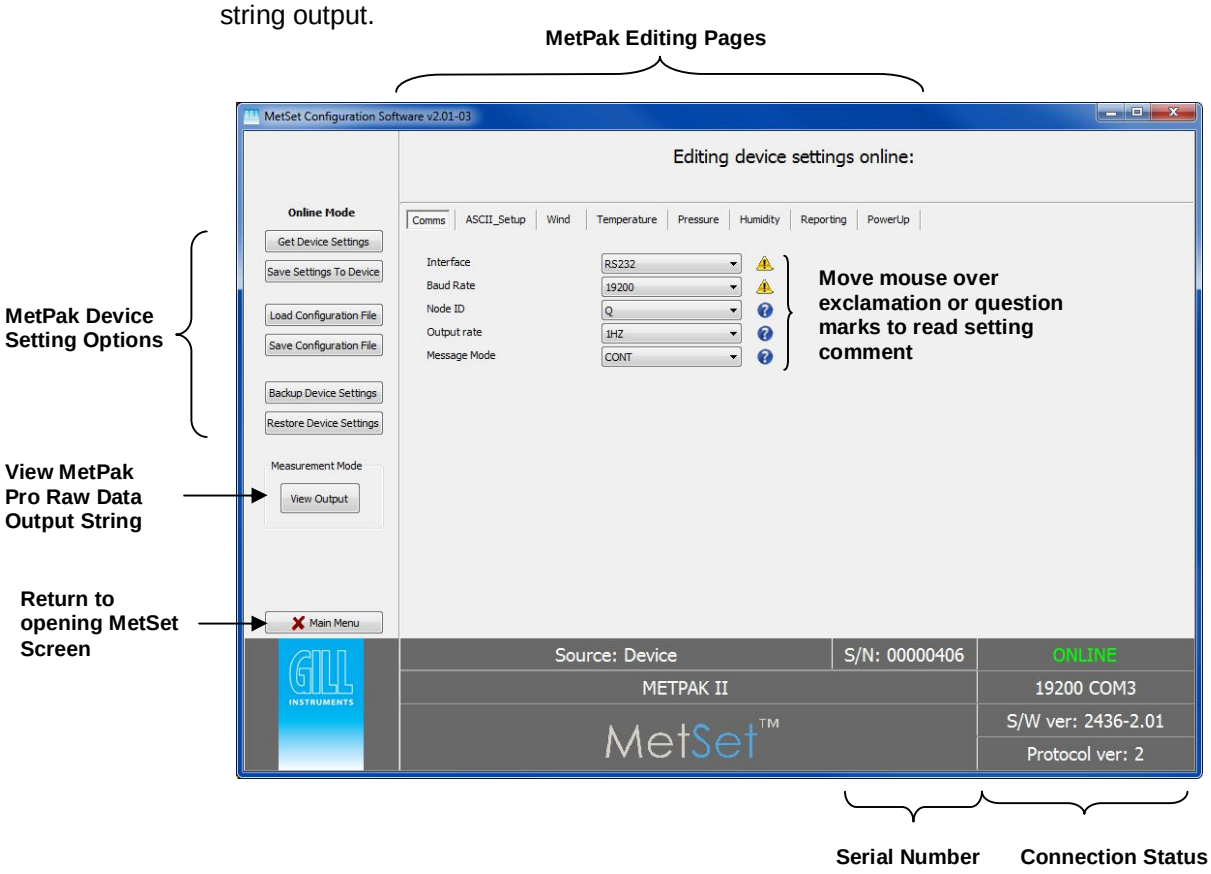
C:\Program Files(X86)\Gill Instruments\MetSet\SessionReports

Close this screen to go to the Editing screens.



3.4.2 MetSet Editing Screen

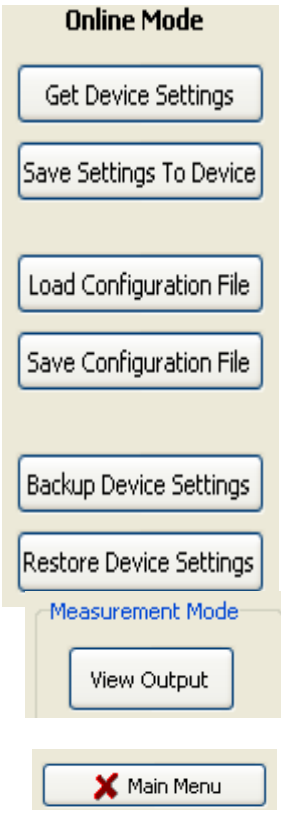
When connected correctly a MetSet editing screen is available to read configuration settings, change configuration settings, save MetPak Base Station configuration settings to a PC file location, upload MetPak Base Station configuration settings from a PC file and view the MetPak Base Station raw data string output.



MetSet Connection Status Information.

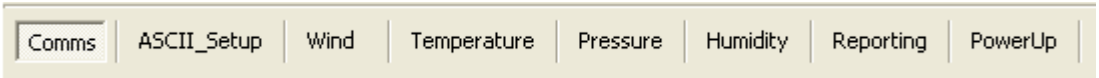
Reading	Function
ONLINE	ONLINE in green indicates the MetPak Base Station has been successfully connected to MetSet. OFFLINE in Grey indicates that MetSet is being used without a MetPak Base Station in communication with MetSet.
19200 COM 3	19200 is a report on the MetPak Base Station Baud rate setting. COM 3 is a report on the MetPak Base Station COM Port connection number.
S/W ver 2436-2.01	2436 is the MetPak Base Station Firmware number 2.01 is the firmware revision. Protocol Ver:2 (Gill Internal Reference).
Source:Device	MetSet reads 'Device' when the source of the data that MetSet has retrieved has come from the MetPak Base Station. MetSet reads 'File' when the source of data has come from a saved file. MetSet reports on the connected MetPak device (e.g. METPAK) and reads the unit Serial Number (S/N: 00000406)

MetSet Online Settings.

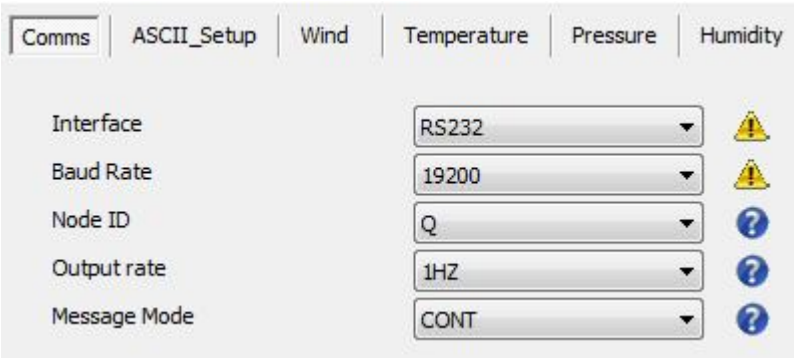


Online Mode Buttons	Function
Get Device Settings	MetSet retrieves the MetPak Base Station Configuration settings.
Save Settings to Device	MetSet configuration settings are saved to a connected MetPak Base Station.
Load Configuration File	When selected MetSet retrieves a MetSet edit PC file and updates MetSet with these settings.
Save Configuration File	When selected MetSet edit settings are saved to a PC file location.
Back Up Device Settings	When selected the MetPak Base Station configuration settings are transferred to MetSet and then to a file location selected on a PC.
Restore Device Settings	When selected MetSet retrieves a MetPak Base Station configuration setting from a PC file, loads it into the MetPak Base Station and updates the MetSet edit settings.
Measurement Mode View Output	Click on View Output to view the raw ASCII MetPak Base Station data string scrolling at the output rate. (View only feature). E.g. ┐ Q,014,000.06,1011.2,042.1,+023.0,+009.4,+12.0,00,└ 40
Main Menu	Click here to go back to the opening MetSet screen

MetSet Editing Pages.



The Comms Page can be used to Select:-



Interface:- **RS232**, RS422, RS485 (point to point) and SDI-12.

Note:- SDI-12 not applicable with a WindMaster or WindMaster Pro connected to a MetPak Base Station.

Baud Rate:- 4800, 9600, **19200**, 38400 or 57600

(1200 auto selected with SDI-12 setting).

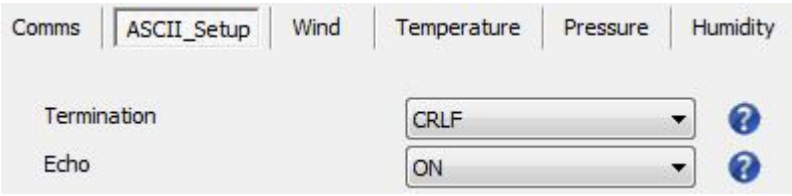
Node ID:- A to P, **Q** to Z.

Output Rate:- 0.25Hz to **1Hz**.

Message Mode:-**Continuous** or Polled.

NOTE: When COMMS or Baud Rate settings are changed and Saved to Device a warning is issued by MetSet. These setting changes will not become active until the MetPak Base Station power is turned off and turned on again. The connecting device will then also need its Comms and Baud rate settings changed to match the MetPak Base Station.

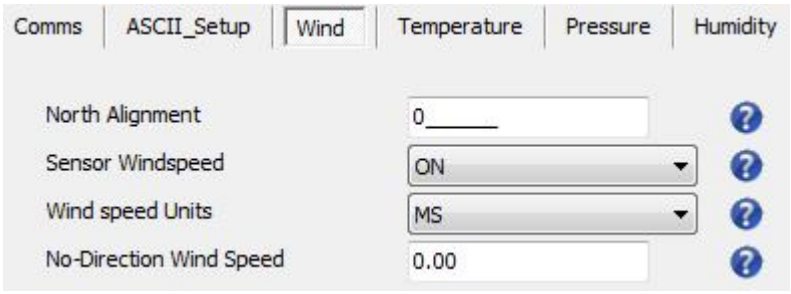
The ASCII Set Up Page can be used to select:-



Termination:- **CRLF** or CR

Echo:- **ON** or OFF.

The Wind Page can be used to select:-



North Alignment from **0**-359 degrees.

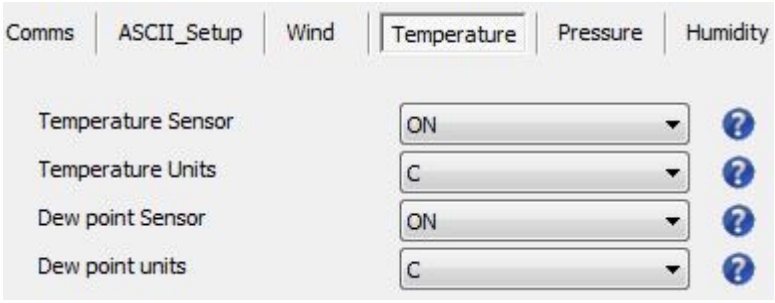
Sensor WindSpeed **ON** or OFF.

Wind Speed Units **MS,** KTS, MPH, KPH, FPM.

(Metres/Second, Knots (Nautical miles/hour), Miles/Hour, Kilometres/Hour, Feet/Minute).

No-Direction Wind Speed **0.00** (Minimum at which Direction readings are updated).

The Temperature Page can be used to select:-



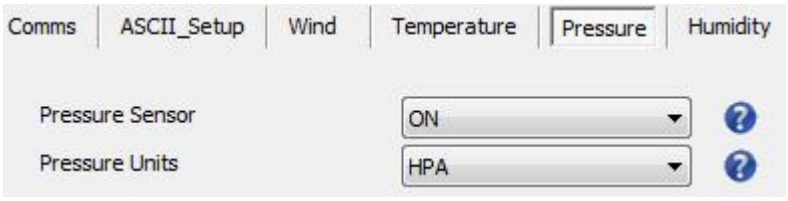
Temperature Sensor **ON** or OFF

Temperature Units **C,** K or F (Centigrade, Kelvin, Fahrenheit)

Dew Point Sensor **ON** or OFF

Dew Point Units **C**, K or F

The Pressure Page can be used to select:-

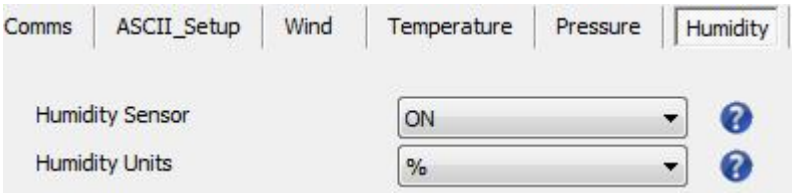


Pressure Sensor **ON** or OFF

Pressure Units **HPA**, MB, MMHG, INHG

(Hecto Pascals, Milli-Bars, Millimetres Mercury, Inches Mercury).

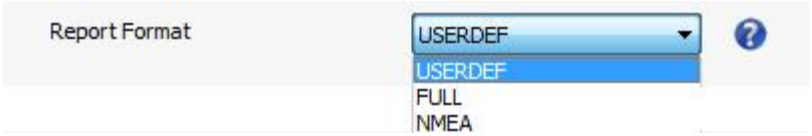
The Humidity Page can be used to select:-



Humidity Sensor **ON** or OFF

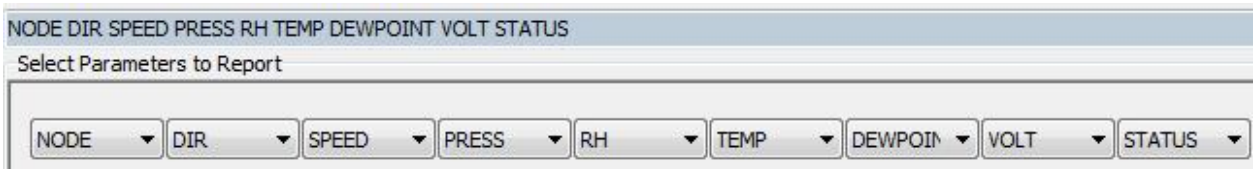
Humidity Units **%**

The Reporting Page with a **2 Axis** Wind Sensor connected can be used to select:-



Report Format **USERDEF**, FULL or NMEA.

Select Parameters to Report



NODE,DIR,SPEED,PRESS,RH,TEMP,DEWPOINT,VOLT,STATUS.

NODE,U-AXIS,V-AXIS,PRESS,RH,TEMP,DEWPOINT,VOLT,STATUS.

Report parameters can be selected in any order or on or off in USERDEF.

The Reporting Page with a **3 Axis** Wind Sensor connected can be used to select:-

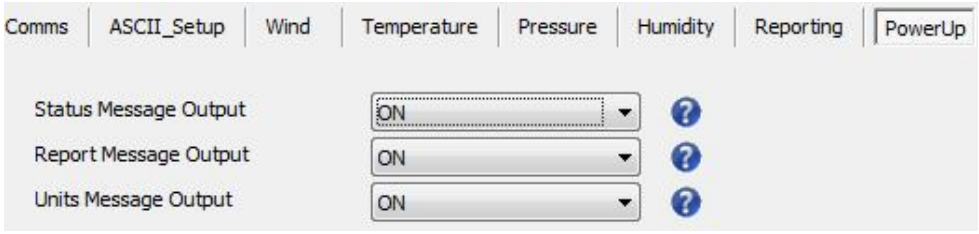
Report Format **USERDEF** or FULL (NMEA not Applicable)

Select 3 axis Parameters to Report e.g.

NODE,DIR,SPEED,W-AXIS,PRESS,RH,TEMP,DEWPOINT,VOLT,STATUS.

NODE,U-AXIS,V-AXIS,W-AXIS,PRESS,RH,TEMP,DEWPOINT,VOLT,STATUS.

The PowerUp Page can be used to select:-



Status Message Output **ON** or OFF.

E.g. METPAK BASE STATION 2436 VB.44,

STARTUP: OK.

Report Message Output **ON** or OFF.

2 Axis NODE,DIR,SPEED,PRESS,RH,TEMP,DEWPOINT,VOLT,STATUS,CHECK.

3 Axis NODE,DIR,SPEED,W-AXIS,PRESS,RH,TEMP,DEWPOINT,VOLT,STATUS,CHECK.

Units Message Output **ON** or OFF

E.g. 2 Axis - DEG,MS,HPA,%,C,C,V,-,-
3 Axis DEG,MS,MS,HPA,%,C,C,V,-,-

NOTE:-
Once all settings have been chosen then save Edited Page Settings to MetPak Base Station by clicking on 'Save Settings to Device' this will change the MetPak Base Station configuration to reflect the new MetSet settings.

3.4.3 Monitoring MetPak Base Station Output Data Using HyperTerminal.

NOTE. . This section describes the procedure using Windows HyperTerminal. Alternatively Gill Wind Software (http://www.gill.co.uk/main/software.html) can be used as a Terminal Emulator (note Tools feature not applicable). Select the required COM port and click on OK, the required 19200 Baud Rate is already selected (or use the Baudrate drop down) then continue as from step 7.

Establishing a HyperTerminal Connection

To monitor MetPak Base Station data using HyperTerminal:

1. Select an available Com port and connect the MetPak Base Station unit.
2. Run **Hypertrm.exe (**Typically accessed via:-
   Start | All Programs | Accessories | Communications | Hyperterminal).
3. Select **New Connection** from the **File** menu.
4. Enter a name for the connection, for example *MetPak Base Station* and, optionally, select an icon to represent it. Click on the **OK** button.
5. In the *Connect To* dialog box, change *Connect Using* to *COMX* (where *X* is the number of the selected COM port). Click on the **OK** button.
6. In the *COMX Properties* dialog box, adjust the *Port settings* to match the MetPak Base Station unit's settings. The default settings are :
   - Bits per second 19200
   - Data bits 8
   - Parity None
   - Stop bits 1
   - Flow Control None
7. Click on the **OK** button.

Message Reporting

MetPak Base Station has two reporting modes:

- Continuous mode

In continuous mode (the default) MetPak Base Station reports continuously. So, if you have set up the connection correctly, you should now see data strings scrolling across the HyperTerminal window. For example:

2 Axis wind Sensor.

Q,270,000.01,1013.8,042.7,+022.0,+008.8,+11.6,00,└ 7E

3 Axis Wind Sensor

┐ Q,270,000.01,-000.02,1013.8,042.7,+022.0,+008.8,+11.6,00,└ 63

- Polled mode

If the unit has been set to polled mode type ?Q (where Q is the unit node letter) to prompt one line of the data string. Note, allow 9.5 seconds after switching on the unit before sending a poll command.

When polled, allow 570 milli-seconds for the unit to respond with a line of data. If the MetPak Base Station detects a pressure/temperature/humidity sensor fault then allow 4 seconds for an error data output.

Enter SETUP MODE to check Ser. Number and Firmware Version

To enter the unit's setup mode:

- If the unit is in continuous reporting mode, type *.
- If the unit is in polled mode, type *Q (where Q is the unit node letter).

The MetPak Base Station unit stops reporting sensor measurements and reporting (if in continuous mode) and responds with the following message:

SETUP MODE (The unit is now ready to receive commands).

Returning to measurement mode

To exit from the setup mode and return to the reporting mode:

Type **Q** and press **Enter**.

The MetPak Base Station unit returns to measurement mode and begins reporting (if set up for continuous mode).

Polling for Data

The MetPak Base Station unit must be set for Message Mode Poll using MetSet software (Comms Page).

A line of data will be output upon receipt of a ? followed by the Node ID (default Q).

It is recommended not to use letters A to F as these characters can appear in the checksum in the data string.

Notes:-

In Polled mode the Base Station MUST be allowed 9.5 seconds after switch on (plus Wind Sensor start up times if separately powered) to be operational before the ? and Node letter are used to enable polling or it will be missed.

When in polled mode, when data is requested allow 570 milli-seconds for the unit to respond with a line of data.

If the MetPak Base Station detects a pressure/temperature/humidity sensor fault then allow 4 seconds for an error data output.

Polled mode can only be used for point to point communications; it is not possible to network units on to a common bus (except in SDI-12 mode).

MetPak Base Station commands

Table 10 MetPak Base Station Commands

Command	Parameters	Description and examples
*****	*	Used to place the unit into a SETUP mode so that User Commands may be sent to change unit settings.
***A-Z**	*A | Z	If the unit is in Polled mode this command is used to place the unit into a SETUP mode so that User Commands may be sent to change unit settings. Where Q is the default node letter but may be set between A to Z. It is however recommended not to use letters A to F as these characters can appear in the checksum in the data string.
?A-?Z	?A to ?Z	?A - ?Z Retrieves a line of data from a MetPak set for Polled mode with a Node identifier set to A to Z. **Note. The unit MUST be allowed 9.5 seconds from switch on to be operational before the ? is used to enable polling, or it will be missed. When polled, allow 570mS for the unit to respond with a line of data. If the MetPak Unit detects a pressure/temperature/humidity sensor fault then allow 4 seconds for an error data output.**

Command	Parameters	Description and examples
ALIGN	0 | 359	Align, sets and reports the degree offset applied to wind direction data read from the MetPak. ALIGN <no parameter> returns the current value ALIGN 0 Sets North Alignment to 0°.
ASCTERM	CR CRLF	Sets ASCII output string terminator. ASCTERM <no parameter> returns the current value ASCTERM CR - ASCII output string terminator is <CR>. ASCTERM CRLF terminator set to <CR><LF>.
BAUD	4800 9600 19200 38400 57600	Sets the serial interface baud rate. Selection must be confirmed with a letter B. Parity selection and duplex operation is optional BAUD <no parameter> returns the current value Example: to change 19200 baud to 4800 Baud: Type BAUD 4800 and press Enter. Change the terminal baud rate to 4800. Type B and press Enter. Completes the 4800-baud selection.
COMMS	RS232 RS422 RS485P2W SDI12	Sets the serial interface communication protocol. COMMS <no parameter> returns the current value. To change to RS422 operation: Type COMMS RS422 and press Enter. (the Comms setting will remain unchanged allowing further settings to be changed and data viewed until the system is powered down and restarted). **NOTE: The hardware connections will need be changed to match the new Comms setting.**
ECHO	OFF ON	Character echo can be enabled or disabled. If enabled, received characters are only echoed while in interactive mode. ECHO <no parameter> returns the current value.
EXIT		Used to change the unit from SETUP mode to Measurement mode (alternatively type Q or QUIT)
HELP		Lists commands that are currently available.
MSGMODE	CONT POLL	Sets the message-reporting mode. MSGMODE <no parameter> returns the current value. MSGMODE CONT - messages reported continuously. MSGMODE POLL - messages only reported when requested by the user (polled mode - see "?" command).
NODE	A | B |C to | Z	Sets the unit Node address for unit recognition or Polling. NODE <no parameter> returns the current value. NODE A sets unit Node to A etc.
NODIR	NODIR X.XX	Sets a minimum velocity (in 0.01m/s steps). If the velocity is equal or less than this value then wind direction information is not displayed. This only affects polar output formats and the maximum value that can be set is 5.00. NODIR <no parameter> returns the current value (default 0.00). NODIR 0.50 sets the unit to not report wind direction at or below 0.50m/s.
OUTFREQ	1/4HZ 1/2HZ 1HZ	Sets the unit data output rate in continuous mode. OUTFREQ<no parameter> returns the current value. OUTFREQ 1/4HZ -sets the unit to output 1 reading every 4 seconds.
PUPMSG	STATUS | ON | OFF	Unit powers up in the state as define by parameter. PUPMSG (power up message) <no parameter> returns the current value, e.g. *STATUS, REPORT, UNITS.* PUPMSG STATUS - displays a firmware issue status message on power up e.g. *METPAK 2436 V2.01 STARTUP OK* PUPMSG STATUS OFF or ON– unit does not display (OFF) or does display (ON) a firmware issue status message on power up.

Command	Parameters	Description and examples
PUPMSG cont	REPORT | ON | OFF	PUPMSG REPORT - displays a header showing currently reported parameters e.g. *NODE,DIR,SPEED,PRESS,RH,TEMP,DEWPOINT,VOLT,STATUS,CHECK* PUPMSSG REPORT OFF or ON-unit does not display (OFF) or does display (ON) a header showing currently reported parameters.
	UNITS | ON | OFF	PUPMSG UNITS -displays a header showing the units of each field in the data output report. e.g. *-,DEG,MS,HPA,%,C,C,V,-,-* PUPMSG UNITS OFF or ON - does not display (OFF) or does display (ON) a header showing the units of each field in the data output report. **NOTE.** There is a power up message in polled mode unless turned off. Power up message is displayed when the unit is being powered up excepting if it has been deactivated. **When the System is powered up allow for 9.5 seconds before the 1st line of Sensor data is output.**
Q or QUIT		Used to change the unit from SETUP to Measurement mode (see also EXIT)
REPORT		Defines a reporting string. REPORT <no parameter> returns the current value, e.g. *NODE,DIR,SPEED,PRESS,RH,TEMP,DEWPOINT,VOLT,STATUS,CHECK*
	FULL	REPORT FULL - all instrument readings are output in the following default order: ┐Q,225,000.02,1023.4,041.8,+023.5,+009.8,+04.9,00,50 (Node, Direction, Wind Speed, Pressure, Humidity, Temperature, Dewpoint, Volts, Status, Checksum).
	NODE	REPORT NODE – reports the unit Node letter (default Q)
	DIR	REPORT DIR reports Polar Direction and Checksum only.
	SPEED	REPORT SPEED reports Polar Speed and Checksum only.
	U-AXIS or V-AXIS	REPORT U-AXIS or REPORT V-AXIS reports U Axis Wind Speed or V Axis Wind Speed and Checksum only.
	PRESS	REPORT PRESS -reports Pressure and Checksum only.
	TEMP	REPORT TEMP - reports Temperature and Checksum only.
	RH	REPORT RH - reports Relative Humidity and Checksum only.
	DEWPOINT	REPORT DEWPOINT reports Dewpoint and Checksum only.
	VOLT	REPORT VOLT - reports Supply Voltage and Checksum only.
	STATUS	REPORT STATUS - reports MetPak Unit status codes and Checksum only.
	NMEA.	REPORT NMEA – reports Wind (WIMWV data), Temperature, Relative Humidity and Barometric pressure (WIXDR data) in NMEA 0183 format. The MetPak Unit data string can be set up in any order with the required sensor outputs. For instance, if it is required to output data in the order Pressure, Polar Wind, Temperature, Humidity, Status. Type REPORT PRESS POLAR TEMP RH STATUS and press Enter. Gives ┐*1023.4,319,000.05,+023.5,038.3,00,1D* **NOTE.** A Hex Checksum figure will always be reported.
SENSOR		**Command not used.**
SERIAL		Used to report the MetPak serial number. e.g. 00000008
SWVER		Returns the MetPak Unit Firmware version e.g. SWVER = 2436 V2.01
UNITS		Valid values are dependent on sensor type. A UNITS command with no parameter shall display a line of test showing the selected units of the current output string. Changes the output units for an individual sensor. UNITS <no parameter> - returns the current value, e.g. e.g. UNITS = -,DEG,MS,HPA,%,C,C,V,-,-
	WIND	UNITS WIND MS - selects metres/second for the wind reading.
	PRESS	UNITS PRESS HPA - Selects hectoPascals for the pressure reading.
	TEMP	UNITS TEMP C - selects centigrade for temperature reading.
	DEWPOINT	UNITS DEWPOINT C - selects centigrade for dewpoint reading.
	RH	UNITS RH % - selects percentage for relative humidity See Table 11 for a list of unit abbreviations.

3.4.4 Configuring MetPak Base Station for SDI-12

Note: SDI-12 is not supported with a WindMaster or WindMaster Pro connected to the Base Station.

To configure a MetPak Base Station unit for SDI-12:

1. Connect a MetPak Base Station to a PC as described in Para 2.2.4.
2. Open MetSet as described on Page 39.
3. Click on the Edit Comms page and select SDI-12 from the drop down menu.
4. Click on Save Settings to Device on the Online Mode Menu.
5. Shut down the MetPak Base Station unit.
6. Change the hardware connections for SDI-12.
7. Power up the MetPak Base Station unit.

3.4.5 SDI-12 Commands

SDI-12 Command Summary

?!	Unit Address (default is 0).
aAb!	Change unit address (a = 0).
aM!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), Temperature (degrees C), Pressure (Hecto Pascals/millibars) and Humidity (%).
aM1!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), Temperature (degrees C), Pressure (Hecto Pascals/millibars) and Dewpoint (degrees C).
aM2!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec) and a 2 digit Wind only Status Codes.
aM3!	Temperature (degrees C), Pressure (Hecto Pascals/millibars), Dewpoint (Degrees C) and full MetPak Base Station Status Codes.
aM4!	Pressure (Hecto Pascals/millibars).
aM5!	PRT, Analogue Input 1, Analogue input 2 and Digital Input 1.
aM6!	PRT.
aM7!	Analogue Input 1 and Analogue Input 2.
aM8!	Digital Input 1.
aM9!	Power Supply Voltage (Volts).
aD0!	Request a line of the above data.

SDI-12 Commands with CRC

- aMC! Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), Temperature (degrees C), Pressure (Hecto Pascals/millibars), Humidity (%) and CRC.
- aMC1! Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), Temperature (degrees C), Pressure (Hecto Pascals/millibars), Dewpoint (degrees C) and CRC.
- aMC2! Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), a 2 digit Status Code and CRC.
- aMC3! Temperature (degrees C), Pressure (Hecto Pascals/millibars), Dewpoint (Degrees C) and CRC.
- aMC4! Pressure (Hecto Pascals/millibars) and CRC.
- aMC5! PRT, Analogue Input 1, Analogue input 2, Digital Input 1 and CRC.
- aMC6! PRT and CRC.
- aMC7! Analogue Input 1, Analogue Input 2 and CRC.
- aMC8! Digital Input 1 and CRC.
- aMC9! Power Supply Voltage (Volts) and CRC.
- aD0! Request a line of the above data.

SDI-12 Command Details

Command	Description	Response	Example
?!	Unit Address	a<CR><LF>	0<CR><LF>
aAb!	Change the unit address a = 0, the default. b = the new address.	b<CR><LF>	1<CR><LF>
aM!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), Temperature (degrees-C), Pressure (Hecto Pascals/millibars), Humidity (%) and a 2 digit Status Code	atttn<CR><LF> a is unit identifier. ttt is time in seconds. n is number of data values. Measurement command to retrieve a reading of the maximum time the MetPak Base Station will take to complete a measurement, have data ready and the number of data values.	00055<CR><LF> 0 is unit identifier. 005 is 5 sec. measurement. 5 is the number of data readings (Direction, Speed, Temperature, Pressure and Humidity).
0D0!	Retrieve a line of the above data.	a<dir><mag><temp><pressure><humidity><CR><LF>	0+220+000.01+021.6+1013.0+041.9<CR><LF>
aM1!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), Temperature (degrees C), Pressure (Hecto Pascals/millibars) and Dewpoint (degrees C).	atttn<CR><LF>	00055<CR><LF>
0D0!	Retrieve a line of the above data.	a<dir><mag><temp><pressure><dewpoint><CR><LF	0+357+000.03+021.6+1013.0+008.0<CR><LF>

aM2!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec) and a 2 digit Wind only Status Code.	atttn<CR><LF>	00053<CR><LF>
0D0!	Retrieve a line of the above data.	a<dir><mag><status><CR><LF>	0+029+000.01+00<CR><LF>
aM3!	Temperature (degrees C), Humidity (%), Dewpoint (Degrees C) and Full Sensor Status Codes.	atttn<CR><LF>	00054<CR><LF>
0D0!	Retrieve a line of the above data.	a<temp><humidity><dewpoint>< CR><LF	0+021.6+041.0+007.8+00<CR><LF>
aM4!	Pressure (Hecto Pascals/millibars).	atttn<CR><LF>	00051<CR><LF>
0D0!	Retrieve a line of the above data.	a<pressure><CR><LF>	0+1013.0<CR><LF>
aM5!	PRT, Analogue Input 1, Analogue Input 2 and Digital Input 1	Atttn<>CR><LF>	00054<CR><LF>
0D0!	Retrieve a line of the above data.	a<prt><AI1><AI2><dig1><CR>< LF	0+027.65+0.0034-099903+0135.000<CR><LF>
AM6!	PRT.	atttn<CR><LF>	00051<CR><LF>
0D0!	Retrieve a line of the above data.	a<prt><CR><LF>	0+027.65<CR><LF>
AM7!	Analogue Input 1 and Analogue Input 2	Atttn<>CR><LF>	00052<CR><LF>
0D0!	Retrieve a line of the above data.	a<AI1><AI2><CR><LF	0+3.5380+017947<CR><LF>
AM8!	Digital Input 1.	atttn<CR><LF>	00051<CR><LF>
0D0!	Retrieve a line of the above data.	a<dig1><CR><LF>	0+0408.000<CR><LF>
aM9!	Power Voltage (Volts)	atttn<CR><LF>	00011<CR><LF>
0D0!	Retrieve a line of the above data.	a<voltage><CR><LF>	0+12.5<CR><LF>

Command	Description	Response	Example
aMC!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), Temperature (degrees-C), Pressure (Hecto Pascals/millibars) Humidity (%) and CRC.	atttn<CR><LF> a is unit identifier. ttt is time in seconds. n is number of data values. Measurement command to retrieve a reading of the maximum time the MetPak II/MetPak II R will take to complete a measurement, have data ready and the number of data values.	00056<CR><LF> 0 is unit identifier. 005 is 5 sec. measurement. 6 is the number of data readings (Direction, Speed, Temperature, Pressure, Humidity and CRC).
0D0!	Retrieve a line of the above data.	a<dir><mag><temp><pressure> <humidity><CRC><CR><LF>	0+139+000.06+022.2+1017.8 +042.7+00BIQ<CR><LF>
aMC1!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), Temperature (degrees C), Pressure (Hecto Pascals/millibars), Dewpoint (degrees C) and CRC.	atttn<CR><LF>	00056<CR><LF>
0D0!	Retrieve a line of the above data.	a<dir><mag><temp><pressure> <dewpoint><CRC><CR><LF	0+140+000.06+022.2+1017.7 +009.0+00D{Z<CR><LF>
aMC2!	Wind Direction/Speed (direction in Degrees, speed in Metres/Sec), a 2 digit Status Code and CRC.	atttn<CR><LF>	00053<CR><LF>
0D0!	Retrieve a line of the above data.	a<dir><mag><status><CRC ><CR><LF>	0+098+000.04+00@sh<CR><LF>
aMC3!	Temperature (degrees C), Humidity (%), Dewpoint (Degrees C) and CRC.	atttn<CR><LF>	00053<CR><LF>
0D0!	Retrieve a line of the above data.	a<temp><humidity><dewpoint> <CRC><CR><LF	0+022.2+042.7+009.0LV{<CR><L F>
aMC4!	Pressure (Hecto Pascals/millibars) and CRC.	atttn<CR><LF>	00051<CR><LF>
0D0!	Retrieve a line of the above data.	a<pressure><CRC><CR> <LF>	0+1017.8GM <CR><LF>
aMC5!	PRT, Analogue Input 1, Analogue Input 2, Digital Input 1 and CRC.	Atttn<>CR><LF>	00054<CR><LF>
0D0!	Retrieve a line of the above data.	a<prt><AI1><AI2><dig1>< CRC><CR>< LF	0-001.19+0000.6+0000.4+0000.000 CQx <CR><LF>

aMC6!	PRT and CRC.	atttn<CR><LF>	00051<CR><LF>
0D0!	Retrieve a line of the above data.	a<prt><CRC><CR><LF>	0-001.19IT@<CR><LF>
aMC7!	Analogue Input 1, Analogue Input 2 and CRC.	Atttn<>CR><LF>	00052<CR><LF>
0D0!	Retrieve a line of the above data.	a<AI1><AI2><CRC><CR><LF	0+0000.6+0000.4FE~<CR><LF>
aMC8!	Digital Input 1 and CRC.	atttn<CR><LF>	00051<CR><LF>
0D0!	Retrieve a line of the above data.	a<dig1><CRC><CR><LF>	0+0000.000EgO<CR><LF>
aMC9!	Power Voltage (Volts) and CRC	atttn<CR><LF>	00011<CR><LF>
0D0!	Retrieve a line of the above data.	a<voltage><CRC><CR><LF>	0+12.2K@R<CR><LF>

3.4.6 Safe Mode

Summary

The MetPak Base Station Safe Mode provides a means of recovering communication with the MetPak Base Station whatever configuration setting may have been made. For instance if the unit has been set for SDI-12 operation Safe Mode can be used to change the communication option back to RS232 or RS422.

Connection

Connect the MetPak Base Station for RS232 communication as detailed on Page 11, Figure 6.

Method

Note at this stage the MetPak Base Station supply to be switched off.

Open a Terminal program e.g. Gill WIND Software (http://www.gill.co.uk/main/software.html) or Windows HyperTerminal

Note if using Gill Wind Software that the Tools features are not applicable.

Open Gill Wind Software.

Serial Port: Set the drop down menu to the required COM Port Connection.

Click on the **OK** button.

Baudrate: Set the drop down menu to **4800** Bauds.

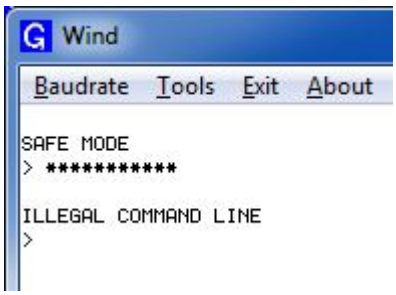
A blank Wind Terminal screen will be opened.

Hold down the * key on the keypad.

With the * key still held down, apply power to the MetPak Precipitation.

This will result in placing the unit into SAFE MODE.

Press Enter to start a new line (Ignore illegal command line).



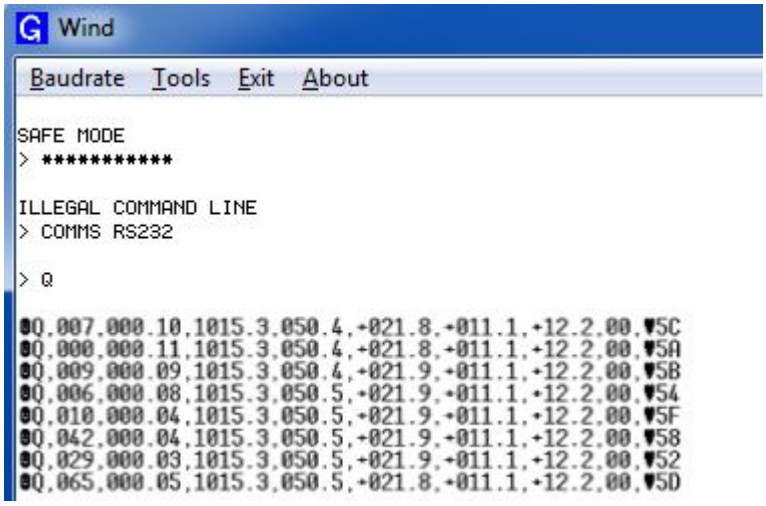
To now change communication from SDI-12 to RS232.

Type COMMS RS232 and press Enter.

Type Q and press Enter to exit SAFE MODE.

Data will now scroll on screen.

Note however for RS232 changes to take place the unit must be powered down and back up again.



Close the 4800 baud rate Wind or HyperTerminal Program.

Power down the MetPak Base Station and re-apply power.

Open a new Wind or HyperTerminal program at **19200 baud** rate.

RS232 data will now scroll on screen at the MetPak Base Station default 19200-baud rate**.**

4. Troubleshooting

4.1 Fault-Finding

Table 11 Common problems and their solution

Symptom	Solution
No output	Check DC power to MetPak Base Station, cable and connections. Check communications settings of the MetPak Base Station and host system match, including correct Com port. Check that the unit is in Continuous mode. Check that in-line communication devices are wired correctly. NOTE: It is usual for Anemometer TX + to be connected to converter device RX +. If appropriate use Safe Mode to attempt to obtain communication with the MetPak Base Station.
Corrupted output	Check that the communication settings of the MetPak Base Station and host system match. Try a slower baud rate. Check cable lengths and type of cable.
One way communication	Check that the wiring is in accordance with the manual.
Unexpected Temperature /Dewpoint readings	Check that the Temperature and Dewpoint units of measure (C, F, K) settings are correct on power up.
Unexpected Wind readings	Check that the Wind Sensor units of measure (m/s, knots, kph, ft/min, mph) settings are correct on power up.
Unexpected Temperature/Dewpoint and Humidity readings	Check that the HygroClip filter is clean.
Unexpected Barometer Readings	Check that the Hub Box Gortex filter is not blocked.
Status code not 00	See Table 12

Table 12 Status codes as output with the MetPak Base Station data string

Code	Status	Condition
00	OK	No fault conditions detected in measurement period.
01	Wind Sensor Axis 1 failed	U Axis blocked or faulty.
02	Wind Sensor Axis 2 failed	V Axis blocked or faulty.
03	Wind Sensor Axis 3 failed	W Axis blocked or Faulty (WindMaster/Pro only).
04	Wind Sensor Axis 1 and 2 failed	U and V axis blocked or faulty.
05	Wind Sensor Axis 1 and 3 failed	U and W axis blocked or faulty (WindMaster/Pro only).
06	Wind Sensor Axis 2 and 3 failed	V and W axis blocked or faulty (WindMaster/Pro only).
07	Wind Sensor Axis 1,2 and 3 failed	U, V and W axis blocked or faulty (WindMaster/Pro only).
08	Wind Sensor NVM error	Non Volatile Memory checksum failed, data could be uncalibrated.
09	Wind Sensor ROM error	Read Only Memory checksum failed, data could be uncalibrated.
0B	Wind Sensor reading failed.	Wind Sensor faulty.
10	Hygroclip error	Hygroclip faulty.
20	Dewpoint error	Hub Pec faulty.
40	Humidity error	Hygroclip faulty.
66	Wind Sensor Power	Check Wind Sensor is powered
67	Wind Sensor RS422 Communications	Check RS422 communication wiring
80	Pressure Sensor Warning	Pressure sensor reading not available/unit faulty.
XX	More than one fault	Fault condition that can be the sum of 0B,10, 20 or 40. e.g. 1B would mean that both the Wind Sensor (0B) and Hygroclip (10) were faulty.

4.2 Servicing

In the event of failure, prior to returning to an authorised Gill distributor it is recommended that:

- All cables and connectors are checked for continuity, bad contact, corrosion etc.
- A bench test is carried out as described in the next section.

Contact your supplier if a fault persists.

4.3 Bench Tests

Carry out a bench test as follows:

1. Connect the MetPak Base Station unit to the host PC and power supply, using a known working test cable.
2. Check that the unit is correctly configured by going into Set Up mode using MetSet.
3. Check for normal output data, and that the Status Code is OK – 00.
4. If the status code is other than 00, refer to Table 12 for a list of status (error) codes.
5. Use an office fan or similar to check that the unit is sensing wind, turning the Wind Sensor to simulate changing wind direction and to check that axes are functioning.
6. Check for output changes in temperature and relative humidity sensor (the fan will also cause small changes in these properties).

5. Maintenance

Wind Sensor

If there is any build-up of deposits on the unit, it should be gently cleaned with a cloth, moistened with soft detergent. Solvents should not be used, and care should be taken to avoid scratching any surfaces. The unit must be allowed to defrost naturally after being exposed to snow or icy conditions, do NOT attempt to remove ice or snow with a tool.

There are no moving parts or user-serviceable parts requiring routine maintenance.

Opening the unit or breaking the security seal will void the warranty and the calibration.

UV Shield (RM Young Model 41003)

If there is any build-up of deposits on the unit, it should be gently cleaned with a cloth, moistened with soft detergent. Solvents should not be used, and care should be taken to avoid scratching any surfaces. The unit must be allowed to defrost naturally after being exposed to snow or icy conditions, do NOT attempt to remove ice or snow with a tool.

HygroClip for Temperature, Humidity and Dewpoint (Rotronic Model HC2-S3-GI)

For extreme environments such as maritime installations, chemical plants or other areas of high pollution or contamination, Gill highly recommend replacement of the temperature and humidity probe filter every 6 months to ensure proper performance.
Corroded, discoloured or clogged dust filters should be replaced.

If the filter is not replaced it is very likely you will see elevated humidity levels with time and if this is allowed to develop for a longer period of time it can lead to permanent damage on the electronics of the temperature probe due to the very high moisture content and corrosive effect of the pollutant or salt.

Rotronic Temperature and Humidity filter replacement:

The Rotronics polycarbonate dust filter screw-on cap is available from:-

Gill Instruments	Part Number	1723-PK-025 (2 filters).
Rotronic	Part Number	NSP-PCW-PE (1 filter).

If you need to replace the dust filter cap, carefully unscrew it and withdraw carefully avoiding contact with the Temperature and Humidity circuit board. When re-fitting the filter cap, ensure the circuit board connections are not bent.

Consideration should be given to an annual calibration check of the HygroClip sensor by the manufacturer.

If you are replacing the whole cartridge, unscrew the metal ferrule and return the probe to Rotronic for calibration. Refer to the Rotronic Website for more details:

http://www.rotronic-humidity.com/content/meta/kontakt.php

NOTE. If you return the sensor to a HygroClip supplier for exchange, please request that the return unit has the dewpoint feature enabled (HCS2-S3-**GI**).

Barometer (on Hub PCB)

The Barometer device is maintenance-free, however, if required observe the following with regard to the central Hub box screw cap Gore-Tex® filter.

Pressure Sensor Filter Replacement:

There is a small venting filter for the pressure sensor of the MetPak Base Station located on the 'Hub' box lid which ensures proper conditions are present in the MetPak Base Station 'hub' box for pressure measurements without allowing any moisture or other damaging pollutants into the box. This filter is made from Gore-Tex® material and is designed to last a long time without replacement, however, Gill do recommend that this filter is replaced every 24 months to ensure proper operation of the pressure sensor and to keep the electronics inside the 'hub' box dry.

If you do not replace the filter every 24 months you may start to see elevated or erroneous readings of the pressure sensor with time and this behaviour can be corrected by replacement of the Gore-Tex® filter unit.

The Gore-Tex® filter kit is available from:-

Gill Instruments Part Number 1723-PK-024.

To replace the filter, unscrew the 4 screws retaining the hub box lid. Remove the existing Gore-Tex filter and M12 Nut. Fit and secure the new filter with the nut provided. Re-fit the 4 lid screws.

Should you be uncertain as to how often you should be replacing the filters for your application or if you wish to discuss this in more detail please contact Gill support and we will be able to provide a recommendation for you.

Returning the MetPak Base Station

If the unit has to be returned, it should be carefully packed in the original packaging and returned to your authorised Gill distributor, with a full description of the fault condition. An RMA number should be obtained from Gill Instruments first if returning directly to Gill Instruments.

6. Technical Information

6.1 Specification

Wind Measurement	
Parameters	Polar Wind Speed & Direction (2 axis sensor) plus Vertical axis (3 axis sensor) or U and V Vectors (2 axis sensor) or U, V and W vectors for 3 axis sensor.
Units of Measurement	m/s, knots, mph, kph, ft/min

Wind Speed - Refer to Supplied Anemometer Manual for full details	
Range	0-45m/s WindMaster 0-60m/s WindSonic/WindSonic M 0-65m/s WindMaster Pro 0-70m/s WindObserver 70
Accuracy	± 2% @12m/s
Resolution	0.01m/s
Threshold	0.01m/s
Wind Direction - Refer to Supplied Anemometer Manual for full details	
Range	0-359 Degrees – No dead band
Accuracy	± 3°@12m/s WindSonic Option 2 and WindSonic M ± 2°@12m/s all other Sensors
Resolution	1°

Air Temperature	
Type	Pt100 1/3 Class B
Range	-35°C to + 70°C
Accuracy	±0.1°C
Resolution	0.1°C (0.1°F)
Units of Measure	°C or °F
Relative Humidity	
Range	0-100%
Accuracy	±0.8%@23°C
Resolution	0.1%
Units of Measure	% RH

Dew Point	
Resolution	0.1°C (0.1°F)
Accuracy	±0.15°C (23°C ambient temp @20°C dew point)
Units of Measure	°C or °F

Barometric Pressure	
Range	600 to 1100hPa
Accuracy	±0.5hPa
Resolution	0.1hPa
Units of Measure	hPa, mbar, mmHg, InHg
Compensated for Temperature dependency –20°C to +70°C	

Outputs	
Digital Outputs	RS232, RS422 RS485***** or SDI-12
Baud Rates	1200 (SDI-12), 4800-57600 (ASCII RS232, RS422)
Protocols	ASCII or SDI-12 V1.3
Data Output	0.25, 0.5, 1 Hz or Polled Mode.
MetPak Base Station Status	Status codes provided within the data message string
***** RS485 2 wire point to point only.	

Power Supply	
Input voltage (RS232, RS422, RS485)	12v to 30v dc
Current	Default setting (first value is Base Station current) 15mA + 9mA at 12v with WindSonic Option 2 15mA + 9mA at 12v WindSonic M (plus heater power) 15mA + 50mA at 12v WindObserver 70 (plus Heater power) 15mA + 55mA at 12v WindMaster/WindMaster Pro
Input voltage (SDI-12)	9.6v to 16v dc (12v nominal)
Current	6.1mA +9mA at 12v with a WindSonic Option 2 6.1mA +9mA at 12v with a WindSonic M (plus heater power) 6.1A + 50mA at 12v with a WindObserver 70 (plus heater power) SDI-12 not applicable with WindMaster/Pro

Environmental – Base Station	
Protection Class	IP65
EMC	EN 61326
Operating Temperature	-35°C to +70°C
Storage Temperature	-40°C to +80°C
Operating Humidity	0% to 100% Humidity

Mechanical – Base Station	
External Construction	UV Stabilised white thermoplastic (Wind Sensor and Hygroclip Mountings) and anodized Aluminium bracket.
Fittings	Stainless Steel 316 bracket fittings supplied for clamping to a vertical pipe diameter of diameter 30mm to 58mm.
Overall Dimensions	187mmx282mmx129mm (excluding bracket clamp)
Weight	1.6kg (including bracket)

Software – Base Station	
MetView Display	Free Software providing the means of displaying data and logging data
MetSet Configuration	Free Software providing the means of configuration of the MetPak Base Station

6.2 MetPak Base Station Hub PCB Connections

The following tables summarise the connections for:

- HygroClip
- WindSonic anemometer
- RS232/RS422/RS485/SDI-12 communications. Connection details are also found within the MetPak Base Station Hub box.

Factory Connections

Table 13 HygroClip connections (6-way connector J1)

Connector J1	Wire Colour	Signal Name
1	-	No Connection
2	Blue	RXD from HygroClip UART
3	Red	TXD to HygroClip UART
4	Yellow	Analogue 0V (Not Used)
5	Grey	Supply-ve /Signal 0V
6	Green	Supply +ve (+3.3V DC)

Table 14 Wind Sensor 10 Metre Cable connections (8-way connector J4)

Connector J4	Wire Colour	Signal Name
1	Brown/White	RSR422+ Anemometer Output to Hub
2	Blue/White	RS422+ Hub Output to Anemometer
3	White/Brown	RSR422- Anemometer Output to Hub
4	White/Blue	RS422- Hub Output to Anemometer
5	Green/White	Signal Ground
6	White/Orange	Supply –ve
7	-	No Connection
8	Orange White	Supply +ve
-	White/Green	Screen to Chassis

User Connections

Table 15 PC communications (8-way connector, J5)

Connector J5	Signal Name
1	SDI-12 TX/RX
2	Signal 0V
3	**RS232 TX-**, (or RS422/RS485 TX-) HUB to user
4	**RS232 RX-**, (or RS422 RX-) User to HUB
5	RS422 RX+, User to HUB
6	RS422/RS485 TX+, HUB to User
7	**Supply 0v**
8	**Supply +ve (12v to 30v dc)**

6.3 Electrical Conformity Certificate

EC DECLARATION OF CONFORMITY ACCORDING TO COUNCIL DIRECTIVE 2004/108/EC

We, Gill Instruments Ltd., declare under our sole responsibility that the products:

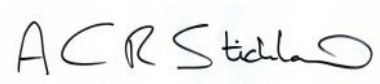
MetPak Base Station

Manufactured by: Gill Instruments Ltd

to which this declaration relates, are in conformity with the protection requirements of Council Directive 2004/108/EC on the approximation of the laws relating to electromagnetic compatibility.

This Declaration of Conformity is based upon compliance of the product with the following harmonised standards:

Emissions	EN61326
Immunity	EN61326

Signed by: 

A.C.R. Stickland – Director

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