

TECHNICAL SPECIFICATION AND DETAILS OF THE FAIRMOUNT 4-20 mA WIND SPEED AND DIRECTION SYSTEM

INTRODUCTION

This document details the technical specifications and descriptions of the component parts of the FAIRMOUNT 4 - 20 mA PC connectable, WIND SPEED AND DIRECTION SYSTEM. This system has been designed to provide a digital display of Wind speed in Metres/Second, Knots or Km/Hour (Switch selectable) and Wind direction in degrees. The system displays Instantaneous, 2 and 10 minute Maximum/Minimum and averaging as well as 2 and 10 minute wind direction variability. Wind Speed and Direction readings are displayed digitally. Wind directions is also represented graphically using a 36 segment LED display.

The system has been engineered for continuous operation in all environments and the highest consideration has been placed on system reliability.

The system can be set up to drive alarms.

Signal transfer is via 4 - 20 mA current loop with a maximum distance between the outstation (stainless steel enclosure containing the sensor signal interface) and the Desk top display of approximately 1 km. dependant on the cable core resistance which will affect the 24vdc., supply from the desk top display to the sensor signal interface which must be within +/- 10% to enable the system to operate correctly.

SYSTEM DESCRIPTION

Desk Top Digital Display

This unit contains:

The Wind Speed Digital Display

The Wind Direction Digital and analogue display

A switched and fused (2.5mA) mains power inlet

A Circular connector for providing 24vdc to the Outstation, 4 - 20mA loops for both wind speed and wind direction and a spare pair for the alarm (when fitted).

A 9 way 'D' (M) connector providing an auxiliary output to drive other display and recording instruments such as slave displays and chart recorders. Any number of devices of this type can be connected by 'daisy-chaining' from this connector up to a sum load of 500 Ohms (i.e. up to 10v loop voltage at 20mA).

A 9 way "D" (F) connector providing Serial output to the PC.

Switched Mains Power Supply module - 220/240 AC Mains in to 24vdc

24vdc Fan to assist air circulation around the power supply.

Wiring harness.

Inter-connecting cable

This system would be supplied with a suitable inter-connecting cable to link the desk top display to the outstation enclosure according to the requirement to be determined by a site survey.

The user will note that the Desk top display end of the cable is fitted with a connector having a pin carrier which mates with the chassis mounted socket carrier on the rear panel of the Desk top display unit. Only this end will fit as the other end of the cable has the opposite pin/socket regime ensuring that at no time can pins carrying 24vdc be shorted inadvertently.

Outstation

This unit consists of:

Sensor Signal to 4-20mA Interface unit

3 circular connectors

All mounted within the EMS800 AWS (Automatic Weather Station) stainless steel enclosure

Mounting the hardware and connecting the system together

1. Identify the following modules:

The PC with GDP Software installed and on CD ROM

The Desk top display

The mains cable

The Interconnecting cable

The Outstation Enclosure (EMS800)

2. Fix the EMS800 Mast in position as described in the mast manual.

NB: When choosing the site for the sensors try to avoid mounting the sensors too close to buildings, trees and other structures which would mask the sensors from the true air flow.

3. Mount the sensors to the cross arm, the cups to the anemometer and the vane to the wind vane. Note that these are held in place by gravity operated fixing devices - the cups will fit in any position by holding the sensor upright and placing the cup assembly over the spindle and lightly pushing down against the spring until downward movement stops and then release the cups. If the cups have located correctly, they cannot be removed. In the event you do need to remove them, invert the sensor and push the cup assembly against the spring and then withdraw them from the sensor. The wind vane is located to it's sensor in an identical fashion except that it will only locate in one axial position in order to align it correctly and so care must be taken to find the correct position where the locking device will catch. Checking for correct location and removal are as for the anemometer.

4. The sensors and cross arm assembly can now be mounted on the top of the mast.

5. Determine north with the aid of a compass and align the wind direction sensor with the arrow on it's body facing North.

6. Run the cables neatly down the pole/mast, tying them at regular intervals with cable ties (user provided) until they reach the place where they will be connected to the Outstation wall mounted enclosure.

7. Mount the enclosure to the mast.

8. First, taking up any cable slack in a neat coil, plug the sensors into the bottom of the EMS800 Outstation enclosure according to the lable on the bottom of the enclosure.

9. After routing and securing the inter-connecting cable from the desk top display, out of the building to the Outstation enclosure, take up any slack into a coil and connect it to the central circular chassis mounted pin carrier at the base of the enclosure. The user will note that this cable end will only fit the central connector as it's configuration as a socket carrier is such that it will not match either of the two sensor chassis mounted socket carriers and so incorrect connection cannot be achieved.

10. Plug in the IEC Mains lead to the IEC socket on the rear panel of the Desk top display unit and switch on the power using the rocker switch provided.

Observe the Digital displays which should give sensible readings.

See GDP Manual for details of the Graphical Display datalogging and display software.

Auxiliary Output

A 9 way 'D' connector is provided on the rear panel of the Desk top display for driving slave displays and chart recorders. A spare plug and cover is provided to aid the user in connection from this socket should he wish to utilise it.

Numbers of displays and chart recorders etc., can be 'daisy chained' from this socket within the limitations stated above and in the specific module manufacturers manuals supplied with this system.

The pin configuration for this socket is as follows:

Pin No.	Colour	Function
1	Black	Wind Speed +mA Input Signal
2	Brown	Wind Speed -mA Input Signal
3	N/C	
4	Orange	Wind Direction +mA Input Signal
5	Yellow	Wind Direction -mA Input Signal
6	Violet	Alarm (if configured and connected)
7	Green	Alarm (if configured and connected)
8	Blue	0vdc
9	Red	+24vdc

Extending the Interconnecting cable

If it is found necessary to extend the distance between the Desk top display unit and the out station the following points should be noted.

To avoid voltage drop and subsequent malfunction of the system, core sizes should be of sufficient size to ensure a 24vdc supply +/- 10% is maintained at the outstation. The power supply inside the Desk top display has a small adjustment facility which may help if voltage is found to be lower than desired but if this does not provide sufficient supply an alternative power supply arrangement would have to be considered at the outstation. If this option was adopted, the power supply provided to the outstation via the interconnecting cable would need to be disconnected.

The cable is connected, 'Pin to Pin'. I.E. Pin 1 goes to 1 at the other end, Pin 2 to 2 etc.

Further information

For more detailed information refer to the specific module manufacturers manuals supplied with this system.