

# Microstat Series Digital Electronic Micrometers RS232 Data Output



## MICROSTAT RS232 OUTPUT

The Cadar Microstat micrometer range has a serial data output which is RS232 compatible when used with a level shifting lead such as the Cadar MCS232 or MPC232.

Using the MPC232 lead (yellow plug) the Microstat will output it's currently displayed measured or calculated value each time you press the Data Entry (**D**) key while the lead is connected.

The MCS232 lead (blue plug) configures the Microstat into Dumb mode where the operating modes are disabled (except ins/mm conversion) and the instrument outputs data repeatedly as long as it remains connected.

### **9w D Pinout**

- 2: Data
- 3: Must be held at MARK (-ve voltage)
- 4: DTR
- 5: Screen, 0V
- 7: RTS (MCS232 only - must be held at SPACE, +ve voltage)

You can use Windows HyperTerminal or similar to test the RS232 output.

## MPC232 OPERATION

The MPC232 lead is used to connect the Microstat to printers and general purpose software packages such as MS Excel which expect data as discrete measurements. The software must assert the DTR line to tell the micrometer that it must transmit data on the **D** key (rather than freeze the display). Microstat displays a small '**M**' in the display to show it has recognised the DTR signal. Now, each time you press the **D** key Microstat will transmit as single message.

RS232 protocol is 1200 baud, 7 data bits, even parity, 1 stop bit. The message consists of the displayed value, followed by a trailing symbol (a single character in brackets) if the value is not a live measurement, and is terminated by a Carriage Return and Line Feed pair. In the examples below '\_' represents a space.

Examples

```
_ 0 0 2 . 5 4 <CR> <LF>
_ 0 0 . 9 3 9 4 5 <CR> <LF>
_ 0 0 0 0 6 _ ( N ) <CR> <LF>
_ 0 0 3 . 1 1 6 _ ( M ) <CR> <LF>
```

Trailing symbols ...

- ( N ) Number of data (stats mode)
- ( M ) Mean (stats mode)
- ( S ) Standard deviation (stats mode)
- ( R ) Range (stats mode)
- ( H ) Highest (stats mode)
- ( L ) Lowest (stats mode)
- ( U ) Upper limit (tolerance mode)
- ( L ) Lower limit (tolerance mode)

Using HyperTerminal the M symbol appears when you 'connect' and Microstat transmits a single measurement each time you hit the Data Entry (**D**) button.

## MCS232 OPERATION

The MCS lead is used to connect the Microstat to packages such as Cadar QS-Pro which expect a continuous stream of measurements. The software asserts the DTR line to request transmission of a message and the micrometer transmits the current displayed value without requiring any action from the operator. Microstat displays a small '**M**' in the display to show it has recognised the DTR signal.

RS232 protocol is 4800 baud, 7 data bits, even parity, 1 stop bit. The message consists of a status character prefix followed by the displayed value, terminated by a Carriage Return and Line Feed pair. In the examples below '\_' represents a space.

```
Example @ _ 0 0 2 . 5 4 0 <CR> <LF>
        P _ 0 0 . 7 4 9 8 0 <CR> <LF>
```

The status character is '@' (40h) and one of the least significant character bit is set showing the following...

- |       |          |                |
|-------|----------|----------------|
| bit 0 | D key    | @ changes to A |
| bit 1 | not used |                |
| bit 2 | C key    | @ changes to D |
| bit 3 | Z key    | @ changes to H |
| bit 4 | inches   | @ changes to P |

Hence Z and D pressed together will change @ to I.

D pressed in ins operation changes P to Q.

Using HyperTerminal the M symbol appears when you 'connect' and Microstat transmits data continuously until you 'hang up'..

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