Data Logging

Most data logging operations are used during a field calibration process or troubleshooting a process flow or the meter readings. In addition to any historical data recorded via the 4-20 mA interface, the MFT B-Series provides various logged reports and supports four types of digital data logging:

1. Continuous data logging to the USB port, CSV formatted text output (spreadsheets) using an internal timer
2. USB port, ASCII escape commands
3. Modbus command query(s)
4. Internal volatile RAM logging which can be extracted using KzComm

For additional information and description of the *Log Reports* capability of the MFT B-Series Flow Meter and *Log Mode*, see the Section on *Built-In Diagnostics.*

USB port formatted text

The data logging output is a string of comma separated values sent to the USB port (a Windows driver must be installed to use this as a COM port) with all meter summary information on one line. If captured using a remote terminal program, such as Tera Term or HyperTerminal, and saved to a text file, this will import into a spreadsheet like Microsoft Excel for further data manipulation or plotting.

The data logging function is normally OFF but can be turned ON in *Program Mode* as follows:

Enter *Program Mode*, press **P**, the **654321** access code, and **E**. Press **2** to invoke the *Quick Jump* option entry method and select **Option #18** for the Data Logging setup menu. The meter will prompt as follows:

```
ENABLE DATA LOG
>OFF            ^v
```

Change the response to 'ON' by pressing the **^** or **v** key and press **E** to accept the selection. Once Data Logging has been turned ON, the meter will prompt for a LOG INTERVAL in seconds. The LOG INTERVAL defines the frequency of data logged to the USB port. Using the numeric keys, type in the number of seconds for the LOG INTERVAL. The minimum log interval is 1 second; the maximum is 32,768 seconds or the equivalent of 9.1 hours. The example below will log data to the USB port every 300 seconds (or every 5 minutes). Press **E** to accept the value.

```
LOG INTERVAL SEC
>300
```

The LCD screen echo should be turned off using the "+" key on the remote terminal keyboard when capturing data with the logging feature using the internal timer. This ensures that the data displayed on the local LCD screen is not streamed to the USB port along with the logged data.

Example data from the .csv format logging function imported into a MS Excel spreadsheet:
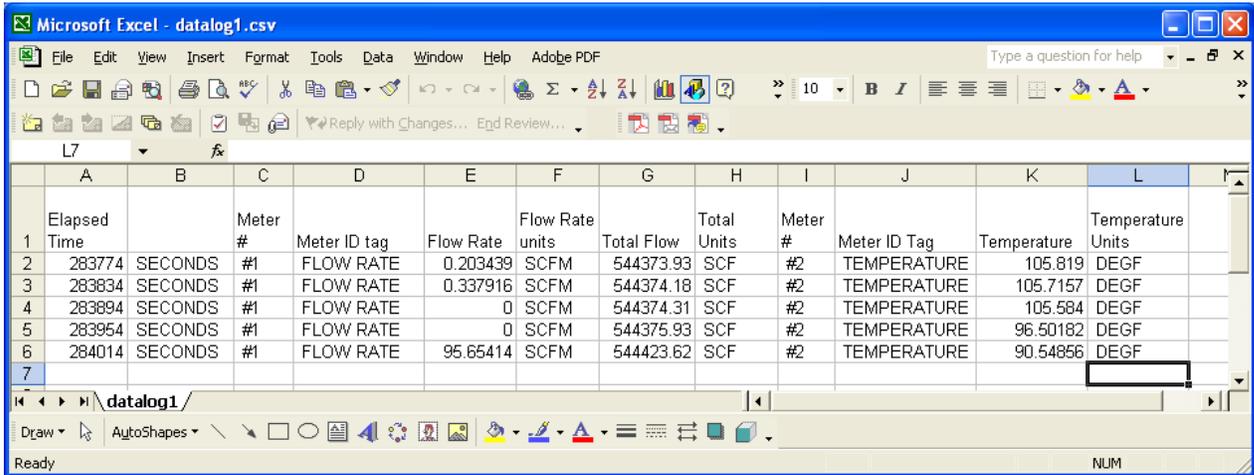
The above data was captured with HyperTerminal and saved as a .csv file. This was then opened directly by MS Excel then column labels were added by hand for this illustration.

Using HyperTerminal, once you have the basic remote terminal operation working you select the top menu "Transfer" then the pull down menu item "Capture Text" as shown here:
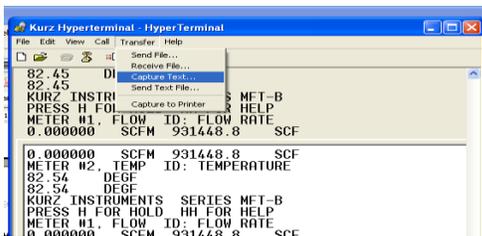
A pop up window will prompt for a file name which you enter with a .csv extension so it will load directly into a spreadsheet without doing an import conversion. Press the "start" button and the data sent by the flow meter to the PC's USB port will be saved to a file.
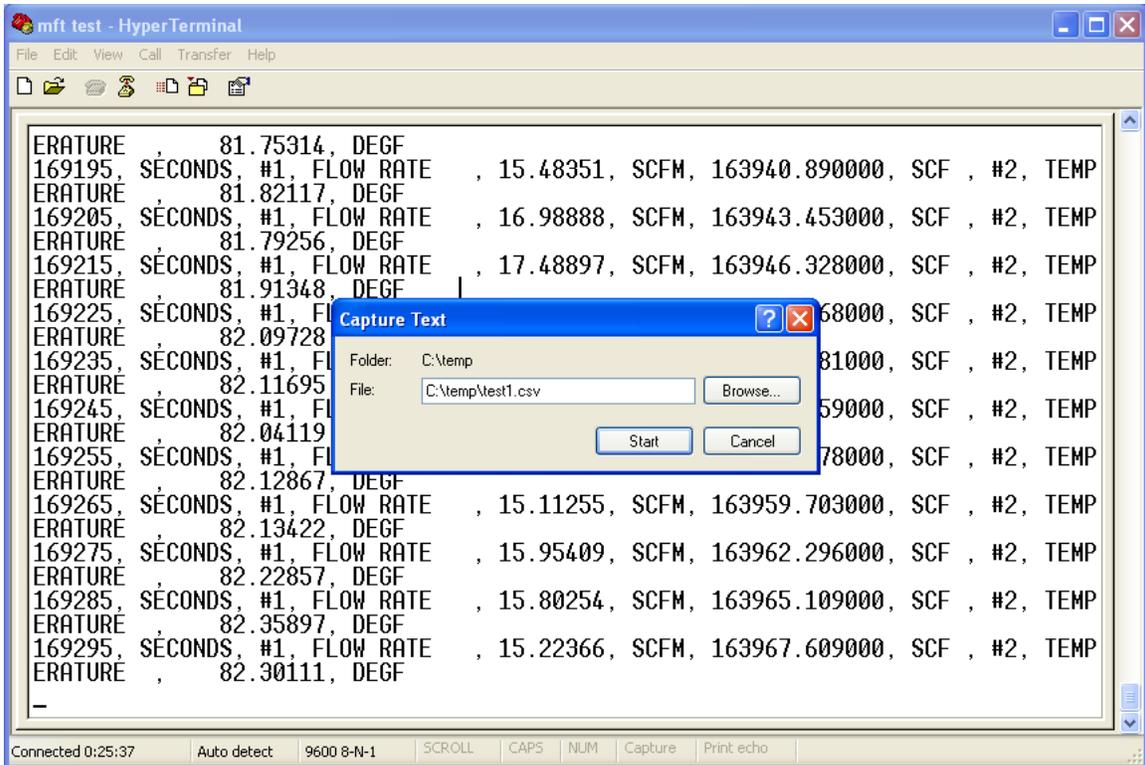
To stop the data capture to the file, select **Transfer** → **Capture Text** →**Stop**, which ends the file capture and closes the file.
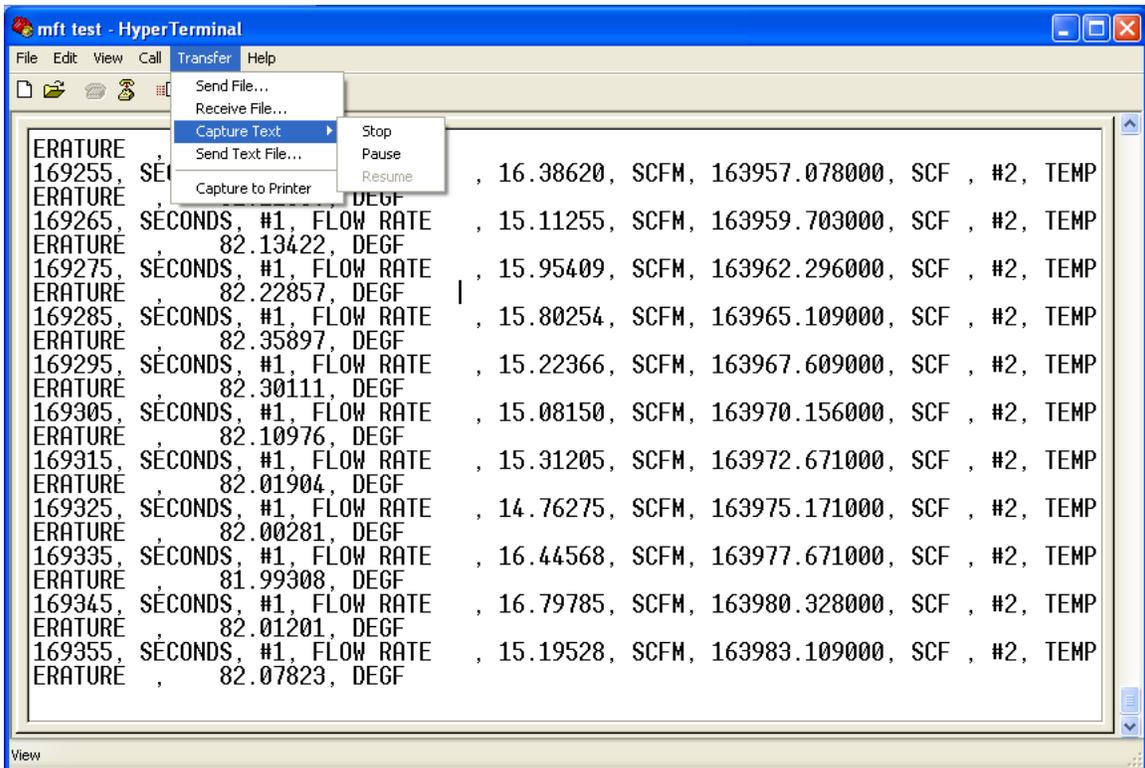
USB Port ASCII commands

The ASCII commands allows for communications with the flow meter using either a custom software program or a terminal emulator program. By using "esc" commands you can obtain the process data of the meter. The structure of the command string is:

<ESC>[command]<CR>

where:
  <ESC> is the escape character 0x1B
  [command] is one of the commands listed in the Table below
  <CR> is the carriage return character 0x0D

All response values are sent as printable ASCII characters and terminated with <CR><NL> (carriage return character followed by newline character). The following Table shows the valid commands and the value(s) provided by the command.

ASCII Command	Description
qflow	Flow Rate as a floating point value (XXXX.XX)
qvel	Velocity as a floating point value
qtemp	Temperature as a floating point value
qmeterid	Tag Name as a string with up to 13 characters
qrppower	Rp Power as a floating point value
qrpcurrent	Rp Current as a floating point value
qrpres	Rp Resistance as a floating point value
qrptemp	Rp Temperature as a floating point value
qrtcres	Rtc Resistance as a floating point value
qsnumber	Meter Serial Number as a string with up to 10 characters
qruntime	Meter Run Time Counter as an integer value
qfunit	Flow Units as a string with up to 4 characters
qmeter1	Comma separated flow meter information: Tag Name, Run Time Counter, Flow with units, Totalized Flow with units, Elapsed Time, Velocity with units, Std Density with units, Flow Area with units, Correction Factor, Filtered Irp, Raw Linearized Output
qai1	External Analog Input Value (output depends on configuration of Analog Input Channel)
qerror	Meter's Event Code as a HEX value with 8 characters
qao1	Analog output channel #1 value as a floating point

	value
qao2	Analog output channel #2 value as a floating point value
qalarm	Alarm status as an unsigned integer

Modbus command query.

Data logging from the MFT B-Series flow meter using Modbus is very flexible as you have access to just about all possible data at whatever data rate you want. A full explanation of how to use the Modbus interface and its commands are available in the network communications section of the manual.

Internal volatile RAM data logging

In support of field service and troubleshooting, there is a continuous logging of the meter's flow, temperature and run time every 10 seconds which is stored in the flow meter's internal memory. There are 20,416 samples for 56+ hours of data. If the power is cycled, this data is lost. The data can be extracted using KzComm then saved in a coma separated value file (.csv) which can then be graphed and analyzed in any spreadsheet program.