Transmit Command - T

The Transmit command causes the instrument to transmit its current data. It is invoked by typing a 'T'. An example of the output is shown below:

```
T 001,1103573931,0000000,01.23,00025.40,-11.4,008.1,05.3*1D95
```

FIELD	DESCRIPTION (UNITS)
001	Output format version (currently 001)
1103573931	Timestamp in seconds since 1/1/1970
0000000	Fault indicator (described on page 3-9)
01.23	Current precipitation rate (mm/hour)
00025.40	Total accumulated liquid precipitation (mm)
-11.4	Ambient temperature (°C)
008.1	Instrument enclosure temperature (°C)
05.3	Approximate wind speed (meters/second)
1D95	CRC checksum (described below)

The 'T' command is echoed, followed by a space. Fields are separated by commas. All fields are fixed length, padded with zeros as necessary. An asterisk (*) separates the last field from the CRC value. The line is terminated with a carriage-return and linefeed (<CRLF>) sequence.

CRC for Commands

Using the Command Checksum

Every command is followed by a generated mathematical checksum. You can ignore the CRC or optionally, use it to verify that serial data itself has not been altered or corrupted between the sensor and your data collection/data management system. Professional installations should use the CRC value to verify the end-to-end data link integrity. You verify link integrity by computing your own CRC value from the returned command string and then compare it to the CRC value computed by the system and appended to the end of each record.

Note: There are many ways to compute CRCs and the computed CRC checksum is defined by the "CRC-16" standard. It is a 16-bit checksum based on the polynomial:

$$x^{16} + x^{15} + x^2 + 1$$

This polynomial corresponds to the hexadecimal value 8005. The CRC value is in hexadecimal format, calculated least-significant bit first, initialized to zero, Note that the CRC checksum does *not* cover the echoed T or the following space, nor does it cover the asterisk separating the data from the CRC value itself. See Numerical Recipes in C, Cambridge University Press, for details. It is not possible to change the format of the internally generated CRC.

Output Data Modes

There are two basic output modes on the system's digital interface: *interactive* or *streaming*. These modes permit flexibility in configuring the system to work with a variety of data management and collection systems. In *interactive* mode, you send a **T** command and the result data string (record) is returned, as a request-acknowledge protocol. In *streaming* mode, the system automatically sends output data records on a predefined time schedule, as a stream of data record strings.

Note that you cannot use streaming mode with certain telephone or GSM modem options as the streams might be inadvertently interpreted as commands to the modem. The scheduled streaming output interval can be set between zero and 9999 seconds. Setting this value to zero disables scheduled automatic streaming output and returns the system to interactive mode.

Displaying the current streaming interval is accomplished with the '**L**' command. A sample of the output of this command is shown below:

Example use of the L command

```
L 0060
```

The '**L**' command is echoed, followed by a space. The streaming interval is then displayed in seconds. The line is terminated with a carriage-return and linefeed <CRLF> sequence.

The automated streaming interval may be set with the '**/L**' command. A sample of the command format is shown below:

```
/L SSSS

   1
```

The '**/L**' command is echoed, followed by a space. The user is then prompted with the format, up to four decimal digits. In this example, the streaming output interval is set to one, which will cause a data record to be sent once per second (this is the fastest output mode possible).

Note: Interactive mode is always enabled as default, regardless of streaming interval. However, because modems cannot answer incoming calls if serial data is streaming into their data ports, avoid streaming mode if you communicate via the modem option. The four-line power on banner is always sent at power on, and the modem will ignore calls during this brief power on period. Be aware that if you set the streaming interval to less than 15 seconds and then accidentally enter streaming mode while the modem is online, thereafter the modem will not answer incoming calls and you will be locked out of the system. Power-cycling will not change this state. To reset the system back into interactive mode, you must physically visit the system and use a terminal emulator to reset it.

Basic command usage and behavior:

- Use the **<Backspace>** key to make any corrections necessary
- Press the **<Enter>** key to update the automatic streaming interval
- Press the **<Esc>** key to abort the changes

- Pressing the **<Enter>** key without entering a value will be interpreted the same as entering zero, i.e., automatic streaming output will be disabled
- It is generally a good idea to verify an edit command was successful by issuing the corresponding query command