**TorqueMate Wrench Data Transfer Protocol**

**General**

The data transfer protocol allows measurement data along with the associated date/time stamps and pre-set limits to be transferred from the wrench to other equipment such as a PC or a PLC controller.

Data can be transferred in either ASCII or binary formats and data transfer can be on a measurement by measurement basis or as a complete upload of internal memory.

**Data Link Settings**

All data is transferred in 8 bit bytes, single start bit, single stop bit, no parity at a speed of 9600 bits per second.

**ASCII data transfer.**

For this the ASCI menu item must be selected on the wrench.

Individual measurement transfer

This is initiated by transmitting the ASCII character 'm' to the wrench. Once the wrench receives this it remains in individual measurement transfer mode until it powers down.

Data can be transferred from the wrench whenever the 'Store?' prompt is ticked in peak or pre-set mode.

The data format is as follows,

Day,Month,Hour,Minutes,Torque value,Torque units,Preset index,Preset high setting, Preset low setting,Preset nominal value,Preset units

Each item is separated by a comma and can be used to feed a CSV spreadsheet file.

In peak mode the pre-set values (high, low and nominal) are set at 0.

**Block transfer**

This is initiated by transmitting the ASCII character 'b' to the wrench. Once the wrench receives this it transfers the entire data memory contents to the external device. The data is separated into individual measurements containing the date/time stamp, measured value and pre-set data, as described in the data format above. The first measurement data are transmitted immediately after reception of the 'b' character.
After each measurement data are transmitted the wrench waits for a 'ready to receive' signal in the form of the ASCII character 'r'. Once this is received the next measurement data are transmitted.
When all memory data has been transmitted the wrench will respond with the ASCII character 'e'.

**Binary Data Transfer**

For this the BIN menu item must be selected on the wrench.

This is similar to the ASCII data transfer.

Returned data format is as follows

Day (1 Byte) Month (1 Byte) Hour (1 Byte) Minutes (1 Byte) Torque value (3 Bytes) Torque units indicator (1 Byte, see below) Pre-set index (1 Byte) Pre-set high setting (3 Bytes) Pre-set low setting (3 Bytes) Pre-set nominal setting (3 Bytes) Pre-set units indicator (1 Byte)
There are no separators between the different data items.

The torque and pre-set units are expressed as follows,

| Units | Units indicator byte contents |
|-------|-------------------------------|
| LBFT  | 0 |
| LBIN  | 1 |
| OZIN  | 2 |
| NM    | 3 |
| CNM   | 4 |
| MKG   | 5 |
| CMKG  | 6 |

**Individual measurement mode**

This is initiated by transmission of the single byte hex value 6D

**Block transfer mode**

This is initiated by the transmission of the single byte binary value 62
The clear to send character is single byte binary 72

When all data is transferred the wrench responds with a single byte binary 65