QDCOUNT

Convert 16-bit Quadrature Decoder Board counts into a running sum.

QDCOUNT *(<inpipe>, [<initial>,] [<mode>,] <outpipe>)*

Parameters

<inpipe>
    Input data pipe of 16-bit counts from a Quadrature Decoder Board.
    WORD PIPE

<initial>
    Initializer value for the running count accumulator.
    WORD CONSTANT | LONG CONSTANT

<mode>
    Keyword string specifying the operating mode.
    STRING

<outpipe>
    Output data pipe.
    WORD PIPE | LONG PIPE

Description

The **QDCOUNT** command converts a sequence of readings of the 16-bit running counter on a Quadrature Decoder Board to produce a running, signed 32-bit count. Many applications accumulate counts that exceed the range representable by the 16-bit hardware counter on a Quadrature Decoder Board. The **QDCOUNT** command detects the overflow events and corrects for them, yielding an accurate 32-bit count. There is one important restriction, however. *The application sampling rate must be designed to assure that no more than 32767 counts up or down can accumulate between readings from the Quadrature Decoder Board.* Otherwise, it is not possible to determine whether a new reading from the 16-bit hardware counter indicates an increase or a decrease, thus resulting in an incorrect running sum.

The *<inpipe>* provides a sequence of sample values, obtained by reading the running 16-bit counter register on the Quadrature Decoder Board.

The optional *<initial>* parameter specifies an initial value for the 32-bit count accumulator. If this parameter is omitted, the starting value of the 32-bit count will be zero.

The optional *<mode>* parameter is a quoted string specifying an operating mode that affects the way processing is started. The **QDCOUNT** command has two operating modes. If the keyword "ABSOLUTE" or "ABS" is specified as the mode string, all counts present in the Quadrature Decoder Board register are considered meaningful. For this mode, the first output produced by the command will equal this first value plus the specified initial counter state. On the other hand, if the keyword "RELATIVE" or "REL" is specified as the mode string, **QDCOUNT** presumes that an indeterminate number of counts could exist in the Quadrature Decoder Board count register at the time when processing starts, hence only changes subsequent to the initial count matter. For this mode, the first output produced by the command equals the *<initial>* parameter, and subsequent outputs reflect the cumulative change in counts relative to the first observed count. If the *<mode>* option is omitted, the default value is "RELATIVE".

The *<outpipe>* parameter specifies an output pipe. For each value received from *<inpipe>*, one value is written to *<outpipe>*. Each output value reports the current updated value of the 32-bit internal accumulator. If *<outpipe>* is a WORD valued pipe, the higher 16 bits are truncated, which could result in an overflow condition if the 32-bit accumulated count is too large. There is no protection from overflow conditions for either a WORD or LONG valued output pipe, but overflow is more likely to be a problem for the WORD case because of the relatively limited count range.

The **QDCOUNT** command responds to the value of **OPTION** BUFFERING at the time that the **QDCOUNT** starts. If used in control applications requiring minimal response latency (at the expenses of more processing overhead), specify the BUFFERING=OFF option.

The initialization sequence in the **QDCOUNT** command is different than it was in earlier 16-bit versions of this command. This can affect the number and value of samples at the beginning of a measurement sequence. Be sure to re-test when substituting the newer DAPL system version into an existing application that previously used the 16-bit custom command version. If an application downloads the 16-bit **QDCOUNT** custom command version, this substitutes it for the 32-bit DAPL version until the next time the DAPL system is loaded.

Example

```
QDCOUNT(PQD, PRUN32)
```
Accumulate a running 32-bit count, receiving 16-bit Quadrature Decoder Board readings from the WORD pipe PQD, and placing the updated values of the 32-bit running sum in the 32-bit pipe PRUN32. The default initial count of 0 and the default "RELATIVE" processing mode are used.

```
QDCOUNT(PQD2, 1024, "ABSOLUTE", PRUN16)
```
Accumulate a running 32-bit count, but report only the low order 16 bits, receiving 16-bit Quadrature Decoder Board readings from the WORD pipe PQD2, and placing the low 16 bits of the 32-bit running sum into 16-bit pipe PRUN16. An initial count offset of 1024 is applied to the running sum, and the "ABSOLUTE" processing mode is used.

See Also