

QSB Application Examples

Version 1.1

This document shows some examples of the low-level commands necessary to activate some of the basic functions available on the QSB product. This is not a comprehensive list of all features, just a selection of what may initially be the most desired. See the “QSB Command List” for a complete list of the commands. NOTE: Each command below is terminated with a carriage-return and/or line feed character.

1. Setting Up to Read a Quadrature Encoder

- | | | |
|-----|--|---------------------------|
| 1.1 | Enter Quadrature Encoder mode (default) | Command – “W0000” |
| 1.2 | Setting Count Direction | |
| | Count Up (default): | Command – “W04000” |
| | Count Down: | Command – “W04100” |
| 1.3 | Activating Index Mode (count reset on index) | Command – “W0363” |
| 1.4 | Setting 32-bit Count Range (default) | Command – “W0343” |
| 1.5 | Setting Count Range (between 0 and DTR) | Command – “W034F” |
| 1.6 | Setting DTR Value = 499 (decimal) | Command – “W081F3” |
| 1.7 | Read an Encoder Value | Command – “ROE” |

2. Setting Up to Read an Analog Encoder

The input voltage range is limited to 0 – 5 V.

- | | | |
|-----|---------------------------|--------------------------|
| 2.1 | Enter Analog Encoder Mode | Command – “W0002” |
| 2.2 | Read an Encoder Value | Command – “ROE” |

3. Setting Up to Read a PWM Encoder

The MA3 series 10-bit and 12-bit Encoders are supported.

- | | | |
|-----|---|--------------------------|
| 3.1 | Enter PWM Encoder Mode | Command – “W0001” |
| 3.2 | Read an Encoder Value | Command – “ROE” |
| 3.3 | Read the MA3 encoder resolution (bit#4) | Command – “R00” |

4. Setting Encoder Streaming Value Mode Output

Encoder values are automatically output when the Threshold and Interval Rate conditions are met.

- | | | |
|-----|---|----------------------------|
| 4.1 | Activate Streaming Encoder Value Output | Command – “S0E” |
| 4.2 | Setting Output Value Threshold = 1 | Command – “W0B0001” |
| 4.3 | Setting Output Interval Rate = 9.5ms | Command – “W0C0005” |

5. Capturing an Encoder Value With an External Event Trigger

Use the Digital I/O, bit 0, or a counter triggered event to capture an encoder value.

- | | | |
|-----|---------------------------------------|---------------------------|
| 5.1 | I/O Event Trigger on (H->L) I/O BIT 0 | Command – “W02011” |
|-----|---------------------------------------|---------------------------|



- | | | |
|-----|--|---------------------------|
| 5.2 | Counter Index Activated Event Trigger | Command – “W04010” |
| 5.3 | Read the Captured Encoder Value | Command – “R05” |
| 6. | <u>Reading and Writing to the 4-bit Digital I/O Port</u> | |
| 6.1 | Setting the I/O Direction (all inputs) | Command – “W02000” |
| 6.2 | Setting the I/O Direction (all outputs) | Command – “W02F00” |
| 6.3 | Reading an Input Value | Command – “R01” |
| 6.4 | Writing an Output Value (0x0A) | Command – “W01A” |
| 6.5 | Digital I/O Input Value Streaming | Command – “S01” |
| 7. | <u>Adding a Time-stamp To the Command Acknowledgement</u> | |
| 7.1 | Acknowledgement, Time-Stamp, CR, LF and Spaces | Command – “W15F” |
| 8. | <u>Stepper Motor Control</u> | |
| | Motor step and direction signals are generated and used to control a MDS2 stepper motor driver. | |
| 8.1 | Activate Motor Control (I/O pins assigned to motor) | Command – “W162” |
| 8.2 | Motor Jog | Command – “W169” |
| 8.3 | Motor Move Selected Number of Steps | Command – “W168” |
| 8.4 | Deactivate Motor Control | Command – “W160” |
| 9. | <u>Formatting the Output</u> | |
| | The QSB data output can be formatted to include any combination of the following: time-stamp, spaces between data fields, a carriage-return and /or line feed termination. | |
| 9.1 | Acknowledgement, Time-Stamp, CR, LF and Spaces | Command – “W15F” |
| 10. | <u>Saving the QSB Configuration Parameters</u> | |
| | These parameters can be saved and automatically reloaded at the next power cycle. | |
| | The following parameters can be saved: | Command – “W163” |
| | <ul style="list-style-type: none"> • Encoder Mode • Digital I/O Configuration • Counter Mode Register 0 • Counter Mode Register 1 • Input Transfer Register (DTR) • Encoder Count Threshold • Data Output Interval Rate • EOR Termination Format | |