**AquaSift V3, Firmware Version 00.12**

|  |  |  |  |
| --- | --- | --- | --- |
| **Main Menu** | | | |
| **Binary Command** | **ASCII Command** | **Menu Item** | **Default Value** |
| 0x01 | 1 | Transmission Mode (A)SCII, (M)atLab, (B)inary | M |
| 0x02 | 2 | Number of Electrodes (2 or 3) | 3 |
| 0x03 | 3 | Sample Output Rate ms (1 to 1000) | 2 |
|  | 4 | Transimpedance Amplifier Menu |  |
|  | 5 | Deposition Menu |  |
|  | 6 | Linear Sweep Menu |  |
|  | 7 | Differential Pulse Menu |  |
|  | 8 | Arbitrary Waveform Menu |  |
|  | 9 | Low-pass Filter Menu |  |
| 0x0A | 10 | Get Settings |  |
|  |  |  |  |
|  |  | Firmware Version: xx.xx |  |
|  |  | Product ID: AQS1 |  |
|  |  |  |  |
| 0x4C, 0x6C | L, l | Start Linear Sweep Test |  |
| 0x44, 0x64 | D, d | Start Differential Pulse Test |  |
| 0x41, 0x61 | A, a | Start Arbitrary Waveform Test |  |
| 0x58, 0x78 | X, x | Abort Test |  |

NOTE: Sending T or t (0x54 or 0x74) will return a single character indicating the current transmission mode (A, M or B).

|  |  |  |  |
| --- | --- | --- | --- |
| **TIA Menu** | | | |
| **Binary Command** | **ASCII Command** | **Menu Item** | **Default Value** |
| 0x0B | 11 | TIA Gain Resistor | 4 |
|  | | 1. 100 |  |
| 1. 1k |
| 1. 5.1k |
| 1. 10k |
| 1. 51k |
| 1. 100k |

|  |  |  |  |
| --- | --- | --- | --- |
| **Deposition Menu** | | | |
| **Binary Command** | **ASCII Command** | **Menu Item** | **Default Value** |
| 0x0C | 12 | Enable Deposition (Y/N) | Y |
| 0x0D | 13 | Deposition Time ms (1 to 800000) | 60000 |
| 0x0E | 14 | Deposition Voltage mV (-1650 to 1650) | -500 |
| 0x0F | 15 | Quiet Time ms (0 to 800000) | 0 |
| 0x10 | 16 | Record Deposition Sequence (Y/N) | Y |

|  |  |  |  |
| --- | --- | --- | --- |
| **Linear Sweep Menu** | | | |
| **Binary Command** | **ASCII Command** | **Menu Item** | **Default Value** |
| 0x11 | 17 | Start Voltage mV (-1650 to 1650) | -500 |
| 0x12 | 18 | End Voltage mV (-1650 to 1650) | 500 |
| 0x13 | 19 | Sweep Rate mV/s (1 to 4000) | 10 |
| 0x14 | 20 | Cyclic (Y/N) | N |
| 0x15 | 21 | Number of Cycles (1 to 100) | 5 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Differential Pulse Menu** | | | |
| **Binary Command** | **ASCII Command** | **Menu Item** | **Default Value** |
| 0x16 | 22 | Start Voltage mV (-1650 to 1650) | -500 |
| 0x17 | 23 | End Voltage mV (-1650 to 1650) | 500 |
| 0x18 | 24 | Increment mV (0 to 1650) | 50 |
| 0x19 | 25 | Pulse Voltage mV (-1650 to 1650) | 100 |
| 0x1A | 26 | Pre-pulse Time ms (1 to 10000) | 150 |
| 0x1B | 27 | Pulse Time ms (1 to 10000) | 20 |
| 0x1C | 28 | Sampling Window Width ms (1 to 10000) | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Arbitrary Waveform Menu** | | | |
| **Binary Command** | **ASCII Command** | **Menu Item** | **Default Value** |
| 0x1D | 29 | Append Entry (StartmV StopmV RatemV/s) |  |
| 0x1E | 30 | Replace Entry (Entry# StartmV StopmV RatemV/s) |
| 0x1F | 31 | Delete Last Entry |
| 0x20 | 32 | Delete All Entries |
| 0x21 | 33 | Get Stored Values |
|  | | | |
|  | | Number of Stored Entries (Up to 20000): XXXXX |  |
|  | | | |
|  | | StartmV: -1650 to 1650 |  |
| EndmV: -1650 to 1650 |
| RatemV/s: 1 to 12000 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Low Pass Filter Menu** | | | |
| **Binary Command** | **ASCII Command** | **Menu Item** | **Default Value** |
| 0x22 | 34 | Selected Filter (0 to 7) | 0 |
|  | | Cutoff Frequency |  |
| 1. Off |
| 1. 1Hz |
| 1. 5Hz |
| 1. 10Hz |
| 1. 50Hz |
| 1. 100Hz |
| 1. 150Hz |
| 1. 200Hz |

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary and ASCII Stream Control Words** | | | |
| **Binary Code** | **ASCII**  **Code** | **Counter Word** | **Description** |
| 0x8000 | 32768 | No | Start Deposition |
| 0x8100 | 33024 | No | Start Quiet Time |
| 0x8200 | 33280 | Yes | Start Linear Sweep Segment |
| 0x8400 | 33792 | Yes | Start Differential Pulse, Pre-pulse |
| 0x8500 | 34048 | Yes | Start Differential Pulse, Pulse |
| 0x8600 | 34304 | Yes | Start Arbitrary Waveform Segment |
| 0xF000 | 61440 | No | Test Aborted |
| 0xFF00 | 65280 | No | End Block |
| 0xFFF0 | 65520 | No | End Test |

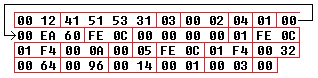
The counter word column indicates that the control word will be followed by another word that represents the current count. Multiple blocks of data can be generated during testing. The counter indicates which block is currently being outputted.

|  |  |
| --- | --- |
| **Binary Error Codes** | |
| **Error Code** | **Description** |
| 0x00 | No Error |
| 0x01 | Value Low |
| 0x02 | Value High |
| 0x03 | Invalid Parameter |
| 0x04 | Array Overflow |
| 0x05 | Flash Memory Full |
| 0x06 | Invalid Command |
| 0x07 | Differential Pulse Voltage Out of Range |
| 0x08 | Differential Pulse Sampling Window Too Wide |

|  |  |
| --- | --- |
| **Serial Communication Configuration** | |
| **Parameter** | **Value** |
| Baud Rate | 230400 |
| Data Bits | 8 |
| Parity | None |
| Stop Bits | 1 |
| Flow Control | None |

**Binary Settings**

When the single byte 0x0A is sent to the device in binary mode, a block of data is sent back that contains all the configuration data. Below is a sample block divided into the different data segments. NOTE: The binary data is in hexadecimal format.



|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Number of Bytes** | **Description** | **Valid Range (Decimal)** |
| 1 | 2 | Firmware Revision | Any |
| 2 | 4 | Product ID | Any |
| 3 | 1 | Number of electrodes | 2 or 3 |
| 4 | 2 | Output data rate | 1 to 1000 |
| 5 | 1 | TIA Gain Resistor | 1 to 6 |
| 6 | 1 | Enable Deposition | 0 or 1 (No or Yes) |
| 7 | 4 | Deposition Time | 1 to 800000 |
| 8 | 2 | Deposition Voltage | -1650 to 1650 |
| 9 | 4 | Quiet Time | 1 to 800000 |
| 10 | 1 | Record Deposition Sequence | 0 or 1 (No or Yes) |
| 11 | 2 | Linear Sweep-Start Voltage | -1650 to 1650 |
| 12 | 2 | Linear Sweep-End Voltage | -1650 to 1650 |
| 13 | 2 | Linear Sweep-Rate | 1 to 4000 |
| 14 | 1 | Linear Sweep-Cyclic | 0 or 1 (No or Yes) |
| 15 | 1 | Linear Sweep-Number of Cycles | 1 to 100 |
| 16 | 2 | Dif Pulse-Start Voltage | -1650 to 1650 |
| 17 | 2 | Dif Pulse-End Voltage | -1650 to 1650 |
| 18 | 2 | Dif Pulse-Increment | 1 to 1650 |
| 19 | 2 | Dif Pulse-Pulse Voltage | -1650 to 1650 |
| 20 | 2 | Dif Pulse-Pre-pulse Time | 1 to 10000 |
| 21 | 2 | Dif Pulse-Pulse Time | 1 to 10000 |
| 22 | 2 | Dif Pulse-Sampling Window Width | 1 to 10000 |
| 23 | 2 | Arbitrary Waveform Stored Values | 0 to 20000 |
| 24 | 1 | Selected Low-pass Filter | 0 to 7 |