SRS

Software Requirements Specification

Voltage calibration and Pulse Delay setting

For E/C/T printers

(Dual driver-board support)

Version 06

|  |  |  |
| --- | --- | --- |
|  | **Name** | **Date** |
| Written by: | Meir Bar Nathan |  |
| Approved by: |  |  |
| Version No: | Version 01 | March 26, 2014 |
|  | Version 02 | March 27, 2014 |
|  | Version 03 | April 3, 2014 |
|  | Version 04 | April 13,2014 |
|  | Version 05 | April 22, 2014 |
|  | Version 06 | April 29, 2014 |

1. Background

The current calibration method uses the values of the resistors in the power supply voltage divider. Recently, due to increase in the printheads efficacy, a need to extend the power supply range has risen. In order to do that the resistors will have to be changed. As a result, we now face a situation here 2 sets of resistors are now in existence. the following SRS defines the way to deal with the new situation.

1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | value | Unit | Comments |
| Production date | mm/dd/yyyy | Date | Stored on driver board. Only year is referred to. |
| R1 (old) | 30.1 | KOHM | Resistor value, in PM |
| R2 (old) | 1.0 | KOHM | Resistor value, in PM |
| R1 (new) | 12.7 | KOHM | Resistor value, in PM |
| R2 (new) | 0.422 | KOHM | Resistor value, in PM |
| PrePulseDelay(old) | As is |  |  |
| PrePulseDelay(new) | As is |  |  |
| PostPulsedelay (old) | As is |  |  |
| PostPulsedelay (new) | As is |  |  |
| Pulsewidth (old) | As is |  |  |
| Pulsewidth (new) | As is |  |  |
| Rpot | 1.2 | KOHM | Resistor value, in PM |
| Maximum voltage | 36.0 | Volt | Range upper limit, in PM |
| PulseDelay (new) | 18 | microseconds | in PM |
| Pulsedelay (old) | 15 | microseconds | in PM |
| HeadDelayRegisters (old) | 1 |  | For all heads |
| HeadDelayRegisters (new) | 1 |  |  |
| MinVoltage | -- | -- | Cancelled. Generated array (for each head) |

1. Calibration process

The process is described in the following flow chart (the process is identical for both support and model heads, except for the parameters).

The process itself does not differentiate between old and new h/w configuration. It is required to identify the type of Head Driver Board in order to use the proper parameters for the calculations done by the application s/w.

The process steps are as follows:

1. Hardware configuration identification.

The Driver Board identification will be done according to the production date (s/w refers to year only) which will be written onto the on-board memory in the production lab. It will done during the testing- process of a printhead, for both service and production.

1. Finding the minimum voltage for each of the printheads.
2. Entry of requested voltage.
3. Check if voltage is in range (between minimum and maximum)
4. Calculation of POT value based on entered value
5. Loading the POT value to the head
6. Incrementing/decrementing the POT value until the voltage is within tolerance
7. Voltage fine tuning.
8. Set the POT value and voltage as a parameter in the Per Machine files.

Except for step 1 and 2, the whole process remains unchanged (It has to be verified that the fine tuning is defined properly).

The process (including limitation of the voltage range, now depending on the h/w configuration of the Driver Board) applies for both manual and s/w-initiated calibration process.

The charts below show the main process steps. Changes from the current process are highlighted in yellow.

1. Pulse Delay setting

Note: *the following paragraph applies only to DM and HS modes. HQ remains unchanged.*

The setting of the Pulse Delay (per head) will be done automatically by the s/w and will be implemented in several instances:

* 1. At the beginning of a voltage calibration process.
  2. Upon mode change (if material assignment to head changes from M to S or vice-versa)
  3. Head replacement (after the head has been replaced)

Instead of the currently existing single Pulse delay parameter an array of 8 binary parameters has to be formed. The array will contain Pulse delay values for each of the heads (PulseDelay\_(new) or PulseDelay\_(old)).

The setting process will assign a Pulse Delay value based on 2 parameters: Driver board configuration and the material assignment to the head.

The following table defines the setting of the Pulse Delay:

|  |  |  |
| --- | --- | --- |
| **Material type**  **Board type** | **Model** | **Support** |
| **Old** | new | old |
| **New** | new | new |

A manual override (for R&D purposes) will be built into the parameter manager (it will disable the automatic setup described above and allow the user to select the parameter manually.



**Appendix 1:**

Version control

|  |  |
| --- | --- |
| **Version number** | **Change description** |
| 01 | Initial version |
| 02 | Resistor values for new configuration changed |
| 03 | Finding of min\_V has been added. Min\_V parameters deleted. |
| 04 | Values changed for PD and HD. ID through production date |
| 05 | Rpot changed to 1.2K (instead of 1K) |
| 06 | Different Pulse Delay for each head. Values of R1 and R2 changed. Rpot become external parameter. Calculation of V\_min changes. Manual override on PulseDelay parameter array. |
|  |  |
|  |  |
|  |  |
|  |  |