Technical Bulletin #1 Setting Flow Rates

Valve Configuration

Before starting to dispense Ink, the flow rates for each Ink need to be calculated individually in order to work out their required flow rates, it is necessary to understand also how the Inks viscosity range will affect its actual dispense rate through the IDS. From the "**Options**" menu, select "**Dispenser**" and then "**Valve Configuration**".

From the diagram below, you will see that there is a facility to split the dispense process into stages, for ease of control. There can be up to 6 separate stages of dispense, although they do not all have to be used. For the purpose of the example shown below, we are assuming a dispense of 200gms, utilizing only 4 of the stages.

Each reservoir has its own "Folder tab" each must be allocated the correct color reference in the "Name" field before the valves can be configured for their flow rates – please refer to the list on previous page.

Folder tabs

The required speed of dispense when the valve is pulsing, in gms/second.

The weight remaining to be dispensed at which this stage ends.

The time (measured in milliseconds) that the valve is open when it pulses.

The example used 4 stages to complete the dispense, a break down of each dispense stage is as follows:

Stage 1.

   ?? Is Active or enabled
   ?? Coarse feed valve dispense
   ?? From 200g down to the completion weight of 100g
(Total of 100g of Ink dispensed into the container)

Stage 2.

   ?? Is Active or enabled
   ?? Coarse feed valve will pulse (open for 150 milliseconds before closing) and dispense at a target flow rate of 5grams/second The target flow rate should be adjusted in increments of 10 if the target rate is difficult to achieve, if the dispense time is taking too long, for example.
   ?? After First Stage 100g down to the new completion weight of 15g
(Total of 185g of Ink dispensed into the container)

Stage 3.

   ?? Is Active or enabled
   ?? Fine feed valve dispense
   ?? After Second Stage 15g down to the new completion weight of 2g
(Total of 198g of Ink dispensed into the container)

Stage 4.

   ?? Is Active or enabled
   ?? Fine feed valve will pulse (open for 150 milliseconds before closing) and dispense at a target flow rate of 0.1grams/second
   ?? After Third Stage 2g down to the new completion weight of 0g or Zero
   ?? (Total of 200g of Ink dispensed into the container)

The example above utilized all four stages, and all were fully active or enabled. Each Stage can be individually enabled or disabled, by checking the tick box. When a Stage has been disabled the stage will become inactive during the dispense sequence. Therefore Inkmanager numerically performs each Stage until it finds a disabled Stage where it then stops.

WARNING: IF STAGE 1 IS DISABLED THEN THE IDS WILL NOT DISPENSE ANY OTHER STAGES!

The flow rate settings require to be entered for each individual Ink reservoir.

What does pulsing do to the Valve during dispense?

Pulsing is where the valve can be software controlled to initially open the valve for a pre-determined amount of time (in milliseconds) and then close the valve, thus causing a pulsing effect when the valve whether coarse or fine is opened for a short period of time before closing.
When pulsing is selected, both the target flow rate and initial pulse time are irrelevant and therefore become grayed-out.

If "Pulsed" is **NOT** selected by being checked (ticked), the valve will be then remain fully open with Ink flowing continuously from the coarse valve, until the dispensed amount of the ink has reached the correct dispense weight. Similarly, if "Coarse" is **NOT** checked then the flow rate will automatically dispense from the fine valve, until the dispensed amount of the ink has reached the correct dispense weight.

What happens if the flow rate is too fast, and the weight of Ink is overshooting the targets I have just programmed?

The IDS flow rates can be individually adjusted to compensate for fast/thin Inks as well as for slow/thicker Inks. Try using the guide below, for

SLOW/THICKER INKS = Decrease the completion weight figure so that the flow rate stops much later.
If Pulsing is being used then increase the "target flow rate" and "initial ON period" values

FAST/THIN INKS = Increase the completion weight figure so that the flow rate stops much sooner, therefore reducing the overshoot.
If Pulsing is being used then reduce the "target flow rate" and "initial ON period" values

When an overshoot occurs in the first few stages of the dispense sequence, the IDS will automatically step down to the next dispense stage, this ensures that the initial overshoot of Ink is compensated for, and is still possible to achieve the correct required dispense of that ingredient using the later finer stages.

What does the message "feed rate too slow" mean? And what do I need to do to fix it?

Occasionally when the IDS has been switched off for some considerable time, or there are extreme variations in temperature during the operational cycle of the machine. The characteristics of the Inks may change, this is generally their viscosity (Inks thickness) or they start to cure.
When this happens the IDS can experience difficulty in dispensing the Ink through either the Coarse or Fine Valves. A warning Message is shown "Feed Rate Too Slow" at this point the Operator can select either **CANCEL** the current dispense or select **RETRY**. The IDS will now continue to complete the dispense, several warning messages may be experienced before the IDS is able to continue.

Note: The Operator may / may not experience the warning message for all Ingredient Inks as they will all vary in their chemical makeup.