## App Note

# Application Note: R42x-K410 Single Material Filling



A 12kg bag is to be filled from a hopper that is accurately filled from a larger hopper. The material flow is controlled using a screw feed that is driven with a three (3) speed controller. The K410 uses three (3) set stages a FILL, followed by a DUMP then a PULSE. The FILL stage is used to fill the small hopper. The DUMP is used to control the emptying of the hopper contents into the bag by weight. The PULSE stage is then used to release the bag. The inputs and outputs on the K410 are set according to the table above.

- A multi-speed filling stage is used to ensure fast accurate filling.
- · Auto-inflight correction is used to ensure filling accuracy is maintained
- Dump-to-weight is used to ensure all product leaves hopper before the end of the batch
- A fill interlock (IO5) is used on the small hopper and must be active for the duration of the fill to indicate the gate is closed and ready for filling.
- A dump enable (IO6) must occur for the dump stage to commence, this is triggered by the bag being put in place
- The three indicator function keys default to F1 Start, F2 Pause and F3 Abort.
- Emergency Stop: An emergency stop is connected to the batch interlock (IO1). Should the batch interlock be removed the batch process will halt. When used the emergency stop in the example cuts power to the IO module shutting down the power to all outputs. By wiring it into the interlock the software can pause to coincide. When the emergency stop is released, the operator can restart the batch with the Start key to safely resume batching.
- The K410 features up to 100 recipes, allowing varying bag sizes to be supported in this example.
- The FINISH stage is a pulse for the duration set by the operator it drives the Pulse Output IO8. It can effectively be used as a wait for the duration set.

### Components:





R420-K410-A M4301 R42x Filling Indicator VDC 8 I/O Module





M4901 M4902 8 voltage free relay outputs Cable, M4901 rated to 250VAC 8A to Module For stand a alone batching system

A10010 Power Supply, 12VDC, 2A DIN Rail

\*Note1 Either R420s ABS or R423s flush stainless steel housing could be used. \*Note2 Suitable external power supply required for M4301 and M4901

Operation:	
Set Up	
Using the Recipe Key, the Operator enters target as required – 12kg in this example	
Operator can adjust flight settings as required using the Flight (8 key) – in-flight and preliminary targets FLIGHT is the expected weight of material in	
flight and is initially set by the operator; auto in- flight can then make fine adjustments. It applies to the slow fill output.	1
M.PRE and F.PRE apply to the medium and fast outputs respectively and are set by the operator. Preliminary target values are specified for the medium and fast feeders in terms of the 'weight before target'	<b>]</b> kg
Operator to set pulse duration of Finish stage as required using the Timer (6 key). Note that the default duration is 0s and if no duration is set the Finish stage is effectively skipped.	



**Delays:** For each of the three stages it is possible to define a delay either at the start (DLY.ST) or the end (DLY.END) of the stage, of up to 5 hours.

App Note



The instrument has three (3) stages, FILL, DUMP and PULSE. These stages have fixed inputs and outputs, unused interlock or enable inputs should be shorted to the COM+ of the module. The table below shows the fixed IO used in the batch.

IO	Stage	Use
IO1	All Stages	Batch Interlock
IO2	Stage 1	Slow Fill
IO3	Stage 1	Medium Fill
IO4	Stage 1	Fast Fill
IO5	Stage 1	Fill Interlock
IO6	Stage 2	Dump Enable
107	Stage 2	Dump Output
IO8	Stage 3	Pulse Output

# App Note

Indiantar	Configuration
Indicator	Configuration.

SAFE SET	TUP	
- BATCH	1	
E GE	N	
	Z.START :	NO
	Z.ILOCK :	NO
	AUTO.ST :	SINGLE
	USE.PT :	NO
	FLT.AV :	2
	F.DISP :	END
	JOG.TGT :	TARGET
	ABT.ACT :	IGNORE
	ERROR :	PAUSE
	TOL :	NONE
	PRT.OUT :	PRINT.1
E MA	Т	
	NAME 1 :	RICE
E ST	AGES	
	STAGE.1	
	FEEDER	: MULTIPLE
	ST.ACT	: TARE
	CORR	: AUT.FLT
	DLY.ST	: 0.000 s
	DLY.CHK	: 0.000 s
	DLY.END	: 0.000 s
	SCP.FLT	: PROD
	SCP.TOL	: PROD
	STAGE . 2	
	DMP.TYP	: WEIGHT
	DLY.ST	: 0.000 s
	DLY.CHK	: 0.000 s
	DLY.END	: 0.000 s
	TOL.HI	: 0.000 kg
<b>—</b> ···	STAGE . 3	THITON
	NAME	: FINISH
	DLY.ST	: 0.000 s
	DLY.END	: 0.000 s
	SCP.PLS	: GLOBAL

In-flight averaging (FLT.AV): The number of in-flight results to be averaged. If it is greater than five (5) then extreme results are ignored. This averaged in-flight result is used with auto jog and auto flight FILL correction.

## Stage 1: FILL In-flight setting

The slow fill is switched OFF when the weight left to fill equals the in-flight. The in-flight can be set manually or automatically adjusted using past fill results.

Auto Flight (AUT.FLT): Uses the average fill error to calculate a corrected in-flight. The amount of averaging is determined by FLT.AV. The operator can set a starting in-flight value.



### For more information refer to the Reference Manual for this product