

## Conveyor App Utilising HOT keys for Tare and Known Weight Cal

In this application the USC701 converts the loadcell information to a 4-20mA analogue signal.

Periodic loadcell calibration is achieved through an automated process using hot keys on the access module.

### Initial Setup

The value of the test weight and the required full-scale deflection must be stored using the AM702 trim menu.

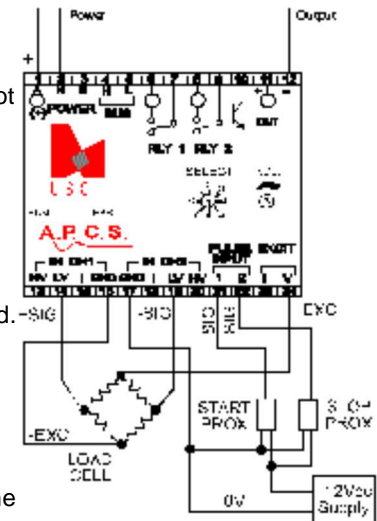
1. Pressing the "ENTER" key, the message "trim constant" will be displayed.
2. Press the "ENTER" key, the message "Test kg" will be displayed. If this is not to be changed, press the "DOWN" key.

To edit press the "ENTER" key and change the value using the

▲ up, ▼ down, ◀ back, ▶ next keys, then save new value with the

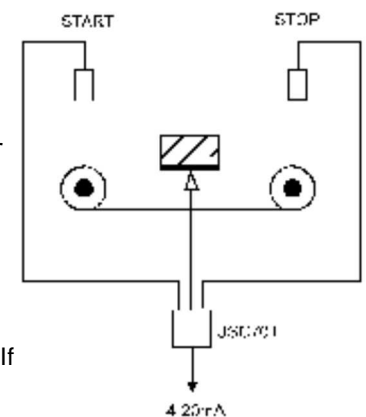
"ENTER" key.

3. The message "fsd kg" will be displayed. Edit if necessary as above.
4. The next message is "exit". Press the "ENTER" key.
5. The next message is "trim run". Press the "ENTER" key.
6. The AM702 is then back in operate 'HOT key' mode.



### Calibration Procedure

1. Run conveyor with no material.
2. Press the "UP" key on the AM702 to start the zero (tare) averaging process and continue to run the empty conveyor for the full belt length or as required.
3. Press the "DOWN" key to stop accumulating zero reading and calculate the zero average.
4. Stop the conveyor and load with a known weight. Press the "BACK" key on the AM702. The new zero and span values will be calculated. The AM702 will display the value of the test weight. Remove the test weight. If the start proximity sensor is pulsed then the AM702 will display the zero weight for that part of the belt.
5. Run conveyor with no material. If the start proximity sensor is pulsed the AM702 will display the zero for each part of the belt.



### Calibration Procedure

1. When an object passes the start sensor the peak value measured on the conveyor will be transferred continuously to the 4 to 20mA output.
2. When the object passes the stop sensor no further changes will occur in the mA output until the next start occurs.

### Declarations

#### Variables Required for Equation

Description	Name	Label	Value
Value of test weight used during calibration (set in trim mode)	Con_a	Test Kg	50
Calculated offset used to scale measurement (set via hot key)	Con_b	offset	0
Calculated scale value used to scale measurement (set via hot key)	Con_c	scale	1
Flag value	Con_d	+1	1
Flag value	Con_e	zero	0
Flag value	Con_f	-1	-1
Required full scale of output (set in trim mode)	Con_g	Fsd Kg	50
Measured peak value between start and stop sensors	Mem4	Kg	0 to 1000
Accumulated weight when averaging zero and span	Mem5	total	0 to

Number of reading in accumulated value  
 Normalized weight output zero = 0 full scale = 1  
 Flag +1 = Measurement in progress  
 Flag +1 = Tare calibration is in progress

Mem6 number  
 Mem7 ana outp 0 to 1  
 Mem8 measure -1 to +1  
 Mem9 taring -1 to +1



## Program List

Command	Comment
Read Ch1	START read input weight and scale
Con_c	
Multiply	
Con_b	
Subtract	END read input weight and scale. Scaled input value is left on stack.
If HK1000-start t	If "UP" hot key then go to start tare process "start t".
If P1 Goto dig 1	If start proximity is active then got to "dig 1" too start peak measurement process.
If P2 Goto dig 2	If stop proximity is active then got to "dig 2" too end peak measurement process.
Read Mem9	Determine if tare operation is in progress.
If>0 Goto taring	
Read Mem8	Determine if measuring operation is in progress.
If<0 Goto alt 3	
Del S	Remove last two compare operations from stack.
Del S	
Read Mem4	START store peak valueRead last stored measurement.
MAX	Retain largest of current measurement and stored measurement.
LAB: alt exit	
Save Mem4	Save largest value
Send M4	
Con_g	START. Normalize measured value for mA output.
Divide	
Save Mem7	
LAB: alt 3	
HotK off	Clear any active hot key
Exit	-----
LAB: taring	Procedure used to accumulate belt weight readings during tare operation.
Read Mem8	
If<0 Goto wait	
fsd	
If HK0100-stop t	If "DOWN" hot key then go to "stop t" and calculate new average tare value.
Del S	
Del S	
Read Mem5	Accumulate total of all readings during taring operation in memory five.
Add	
Save Mem5	
Read Mem6	Count number readings totaled in memory six.
Con_d	
Add	
Save Mem6	
Divide	
Goto alt exit	
Exit	-----
LAB: wait fsd	Procedure used to wait until test weight is placed on belt and button is pressed.
Del S	
Del S	
If HK0010-fsd	If "BACK" hot key then calculate new span and zero values at "fsd cal".
cal	
Goto alt exit	
Exit	-----

LAB: start t	Procedure used to initialize the tare operation by zeroing all measurements and setting the measure and tare flags.
Con_e	0
Save Mem5	Zero measurement total
Save Mem6	Zero number of measurements
Save Mem4	Zero current peak measurement
Con_d	+1
Save Mem8	Set measure flag
Save Mem9	Set tare flag
Goto alt 3	
Exit	-----
LAB: stop t	Procedure used to calculate new tare value from accumulated readings during tare operation.
Del S	
Del S	
Con_b	
Read Mem5	
Read Mem6	
Divide	
Add	
Save Con_b	Save average tare value.
Con_f	-1
Save Mem8	Set measure flag to indicate span calibration is required.
Goto alt 3	
Exit	-----
LAB: fsd cal	This procedure is used to calculate new Span and Offset values.
Con_a	START Calculate new span value.
Divide	
1/x	
Save Mem7	(Save to recall in a moment)
Con_c	
Multiply	
Save Con_c	Save new span value.
Con_b	START Calculate new offset value.
Read Mem7	
Multiply	
Save Con_b	Save new offset value
Con_f	
Save Mem9	
Con_a	
Goto alt exit	
Exit	-----
LAB: dig 1	This procedure is used start the peak measurement process
Con_d	+1
Save Mem8	Enable measure flag
Con_f	-1
Save Mem9	Disable tare flag
Del S	
Del S	
Save Mem4	Save first measurement
Con_e	0
Save Mem5	Clear memories 5 and 6
Save Mem6	
Exit	-----
LAB: dig 2	This procedure is used to finish the peak measurement process
Con_f	-1
Save Mem8	Disable measure flag

Save Mem9	Disable tare flag
Exit	-----
<end>	

## USC Programs

File	Comment
 Help	If unexpected results occur when loading the .usc file press back and click on help for instructions.
 UAP00271.usc	First Issue

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