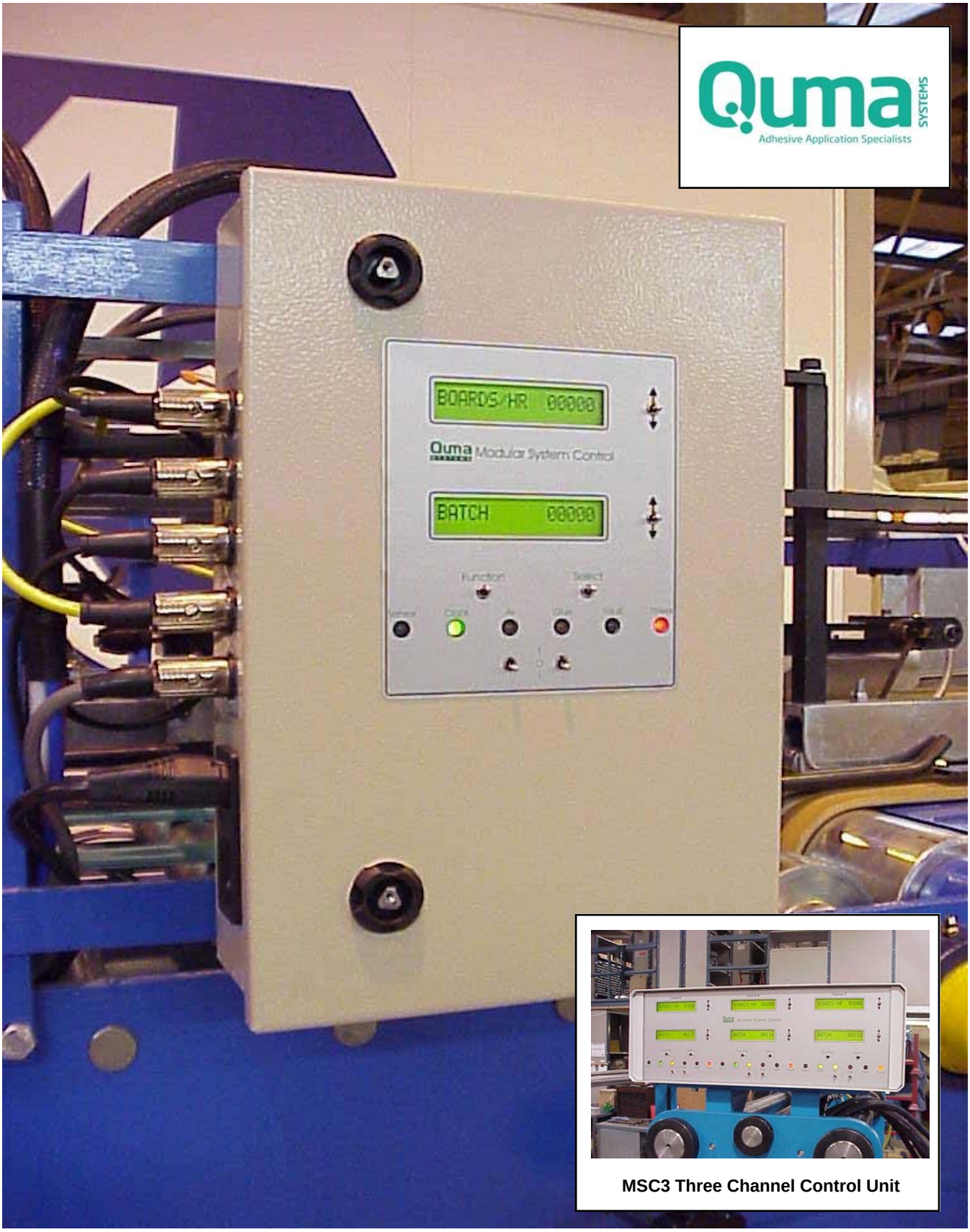

MSC3 Three Channel Control Unit

Modular System Control
Operating Manual

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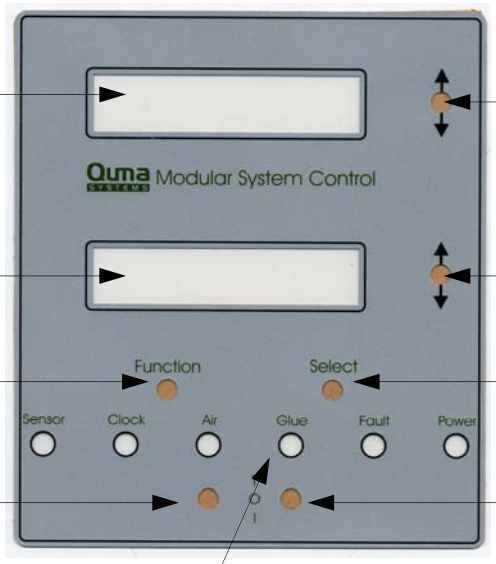
Introduction

Thank you for choosing one of our new Modular Control Systems. Please take a little time to read the following operation instructions so that you may take full advantage of the features that we have built into it to help you improve your productivity. If this is a new installation you may find it helpful to go to page 4 and use PRG CODE first to calibrate the system.

Explanation of the front panel



The indicators have the following functions:

Sensor - will light when the photo-sensor detects a board, carton or object
Clock - will light when the controller receives encoder pulses
Air - will light when the spray air solenoid output is switched on
Glue - will light when the glue solenoid output is switched on
Fault - will light when an error is detected. (see error message section)
Power - will light when the system is switched on.

Please note that the INCREASE/DECREASE switches are used only to change values and the FUNCTION & SELECT switches are used to move through the main and sub-menus. When a value is changed it will be necessary to operate the SELECT switch ONCE to accept the new value and then either the FUNCTION or SELECT switch to move on to the next item.

1. Power Up

When the unit is first switched on it will display 'QUMA CONTROLLER' in the upper window and the software version (V 2.01) in the lower window. After a few seconds it will display the following messages;

BOARDS/HR 00000	This shows the average production rate in boards per hour
BATCH 00000	This shows the current batch total and is reset to zero by pressing the Increase/Decrease switch down or turning the power off.
SPEED MM/S 0000	If the SELECT switch is pressed down the unit will display the machine speed in mm/sec in the upper window. Pressing the FUNCTION switch will return you to the previous window. Press the FUNCTION switch down once more and you will see;

2. Normal/Automatic

NORMAL

NORMAL allows entry of individual glue lines in millimetres, AUTOMATIC allows the controller to calculate the glue line according to what the sensor 'sees'. To change from NORMAL to AUTOMATIC and back use the SELECT switch. AUTOMATIC should only be used when the sensor is mounted in line with the glue head. When using this feature START and STOP are adjusted in the GLUE RADIUS section of PRG CODE. (In AUTOMATIC mode you will not be able to access the next two windows and will move straight to PRESSURE). Now press the FUNCTION switch once and you will see;

3. Glue Setting (not available in AUTOMATIC mode)

L1 START 0001
L1 STOP 0002

To enter the position where you wish to start gluing use the upper increase/decrease switch until the required dimension is shown. Please note that this is the distance in millimetres from the **sensed** edge of the board. Continue measuring from the **sensed** edge to where you wish the glue to stop and enter that value in the lower window using the lower increase/decrease switch. For these entries to take effect it is then necessary to operate the SELECT or FUNCTION switch once. The display will continue to show the entered values so that further small adjustments can be made if required. Pressing the SELECT switch once more will display L2 START and L2 STOP. If you require additional glue lines enter them in the same way as before using the sensed edge as the reference point. There are a total of eight possible glue lines available. (see section 9 in PRG CODE to restrict the number of available lines). If no further entries are required press the FUNCTION switch once and you will see;

4. Lockout (not available in AUTOMATIC mode)

LOCKOUT 0000

This facility should be used in NORMAL glue operation and allows you to enter the length of the board or carton in mms. The feature disables any further signals, caused by print or cut outs, from the photo-sensor until the item is processed. Please set this value to 0000 when using the AUTOMATIC feature. Now press the FUNCTION switch once more and you will see;

5. Pressure (may be hidden if not required)

PRESSURE 0050

If your system has an electronic pressure regulator plugged in to it this feature will allow you to increase or decrease the amount of glue applied electronically. 50 is the mid-point (not a pressure value) and increasing this value will increase the amount of glue. Decreasing the value will reduce the amount of glue. The glue pressure characteristics are set in the PRG CODE section under PRESSURE OFFSET and PRESSURE SPAN. Now press the FUNCTION switch once more and you will see;

6. Glue Detect (may be hidden if not required and not available in AUTOMATIC mode)

GLUE DETECT 00

If your system has a glue detection device plugged into it this will allow you to set your acceptable tolerance (between 1 and 15 mm) for glue position error. Glue patterns outside this set value will generate a signal to a counter and/or an alarm device. Please note that 00 switches this feature OFF. It is also necessary to enter the distance between the glue head and the detection device in mms in the GLUE OFFSET section of PRG CODE. Now press the FUNCTION switch once more and you will see;

7. Programme Code Entry

PRG CODE 0005
PRG CODE 0005

The code shown allows you to enter the sub-menu of settings to set up the running characteristics of the system. Enter 0005 in each of the two windows and press the FUNCTION switch ONCE only. (If the FUNCTION switch is pressed more than once you will have to re-enter the code and start again.) Once you have done this you will see;

7.1 Edge Offset

EDGE OFFSET
0035

Using the lower increase/decrease switch enter the distance in mms between the edge sensor and the glue head application point. An accurate way of doing this is to slide a piece of board towards the sensor until the sensor indicator lights up. Then measure from that edge to the rounded edge of the beading tip or the needle of the spray valve. When the machine is running it may be necessary to fine tune this setting to get the glue in exactly the right position. Please note that it is not possible to set this value at less than 0035. Now press the SELECT switch down once and you will see;

7.2 Glue Offset

GLUE OFFSET
0000

If you are using the GLUE DETECT feature you will need to enter the distance between the glue detection device and the glue application point in mms in the lower window. If no value is entered GLUE DETECT will not appear in the main menu. Now press the SELECT switch down once more and you will see;

7.3 Glue Radius

GLUE RADIUS
0000

This feature has two uses. 1. If you are using a non-contact spray application head you will notice that the ends of the glue pattern are rounded. This is because a static pattern is circular and this needs to be taken into account when entering glue START and STOP points. If you halve the pattern width ie. 10 mm pattern / 2 = 5 mm, and enter that value, the controller will take your start and stop measurements and automatically allow 5 mm at each end. 2. In AUTOMATIC mode this feature is used to set the distance in from each end of the glue tab that you wish the glue to start and stop. Now press the SELECT switch down once more and you will see;

7.4 Compensation

COMPENSATION
0000

This feature allows you to enter the response time of your glue valve, in milliseconds, so that the glue pattern remains constant during speed changes. An extrusion head with a MAC valve will be between 10 and 15 msec depending on pressure used and distance apart. For spray application a setting of between 28 and 32 should be sufficient although the Kaymich spray valve with the new MAC 34 solenoid can respond as quickly as 15 msec. During running, if the glue pattern moves back as you go faster then you will need to increase the compensation value. If it moves forward as you speed up then you are over compensated and need to reduce the value. Now press the SELECT switch down once more and you will see;

7.5 Pressure Offset

PRESSURE OFFSET
0000

If you are using an electronic pressure control you will need to set a static glue pressure. A value of 0040 will give around 10 psi which will be a good starting point. If no value is entered PRESSURE will not appear in the main menu. Now press the SELECT switch down once more and you will see;

To leave the PRG CODE sub-menu now or at any stage press down the FUNCTION switch.

7.6 Pressure Span

PRESSURE SPAN
0000

This sets the machine speed to glue output ratio and allows the amount of glue to be maintained across the range of operating speeds. If 0040 is set in PRESSURE OFFSET then a value of 0003 will give an output of 30 psi at 1 metre/sec, 0004 will give 40 psi and 005 around 50 psi. Now press the SELECT switch once more and you will see;

7.7 Fixed Time Base

FIXED TIME BASE
0000

This feature enables the system to run without input from a rotary encoder**.** If the value is set to 0000 then this feature is switched off and an encoder must be used. If a system is fitted to a fixed speed machine then the speed of the machine can be measured in mm/sec and entered. This will allow you to enter glue start and stop positions in mms in the normal way. Now press the SELECT switch down once more and you will see;

7.8 Encoder Multiply

ENCODER MULTIPLY
01.00

The system requires input from an encoder with a resolution of 1 ppm (pulse per millimetre) of board travel to function accurately unless the FIXED TIME BASE is switched on. In some applications it is impossible to obtain the correct resolution and this feature will allow you to multiply or divide encoder pulses to restore accuracy. A value of 02.00 would be set if the encoder was being driven at half the machine speed and a value of 00.50 would be set if the encoder was being driven at twice the machine speed. If this feature is switched on it will not be possible to enter values in the FIXED TIME BASE mode.

7.9 Language

LANGUAGE
ENGLISH

To cater for a number of European users the system allows the messages to be displayed in five languages. Using the lower increase/decrease switch you will be able to select ENGLISH, FRENCH, GERMAN, SPANISH and ITALIAN. If you now press down the SELECT switch once more you will see;

8.0 Sensor Fault Detection

SENSOR WARNING
ENABLED

On certain types of machinery there is a possibility that the sensor can become obscured by a loose board offcut. This will then prevent the system from applying glue. To alert the operator to this problem the system can check the sensor after each board has passed by looking for a signal after the LOCKOUT has timed out. If a signal is present a fault is assumed and an alarm output switched. This can be used to operate a buzzer, flashing light or stop the machine using a suitable relay. If an alarm is fitted it will continue to operate until the UPPER Increase/Decrease switch is pressed down in the Boards / Hour and Batch Count window. If this feature is not required pressing the Lower Increase/Decrease switch down will switch it off and DISABLED will appear in the LOWER WINDOW. . If you now press down the SELECT switch once more you will return to EDGE OFFSET.

To leave the PRG CODE sub-menu now or at any stage press down the FUNCTION switch.

9. Glue Lines

GLUE LINES
0008

The controller can generate up to 8 glue lines in sequence. This number is rarely required and so, to avoid causing confusion, it is possible, from Software V2.01 (November 2003) to determine the number of glue lines displayed. The default value is 0008 but you can reduce this to 0001 for straight line applications or 0002 for crash lock and four corner gluing. Please make sure that unwanted glue positions are all set to zero in the main menu before using this function.

Faults & Error Messages

If the system detects an error while values are being entered the SETTING ERROR message will be displayed and the FAULT light will illuminate. The sort of errors that can trigger this are;

Glue line STOP value less than or equal to START value.

Entering a GLUE length that is less than or equal to 2 x GLUE RADIUS

Entering a very short GLUE length which, at higher speeds, runs out of COMPENSATION

Entering an EDGE OFFSET value of less than 0035

From software V1.03 onwards a further error checking system has been installed.

When the controller is powered up it takes a few seconds to compare the stored information for glue line settings and calibration with a master set. If it finds any differences it will automatically re-set these values. In extreme circumstances if both sets of data are corrupted then the following message will appear;

MEMORY CORRUPT
USE FUNCTION KEY

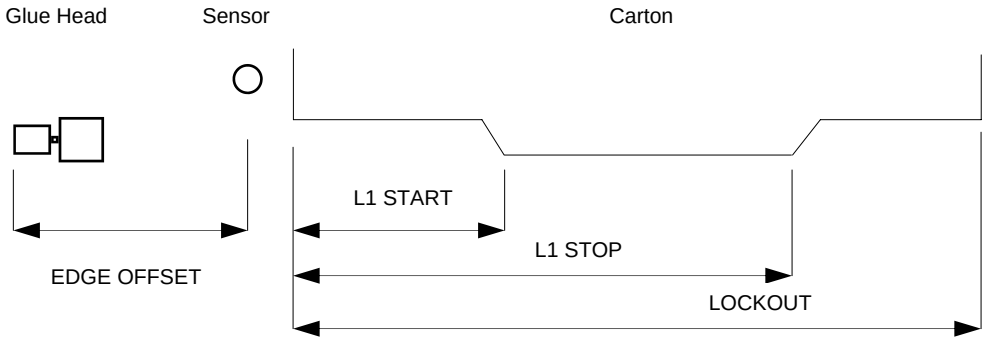
If this message appears then press the FUNCTION switch down once and the following message will appear;

DOWNLOADING
DEFAULTS

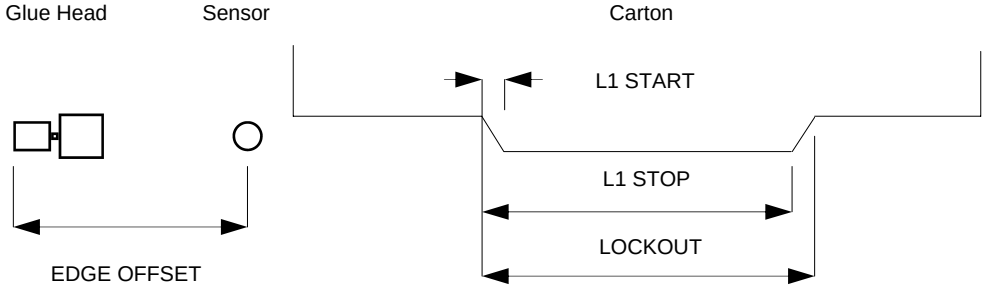
It will now be necessary to use the FUNCTION switch to go to PRG.CODE and re-enter the original values and re-enter your glue line co-ordinates in the usual way.

Installation options and use of Normal and Automatic features

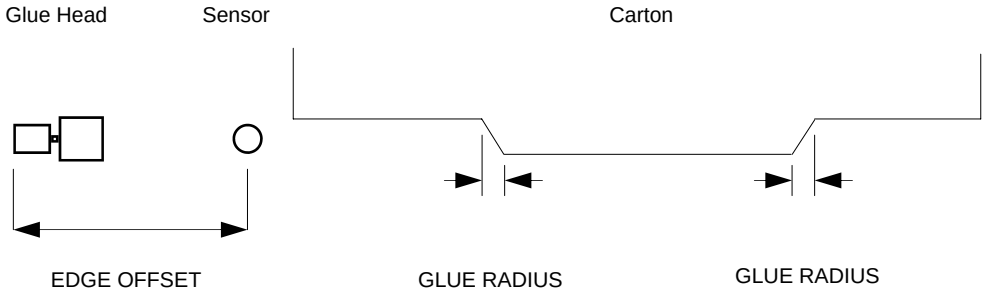
This shows a typical installation where the leading edge of the carton is sensed. In this configuration the AUTOMATIC feature cannot be used because of the position of the sensor.



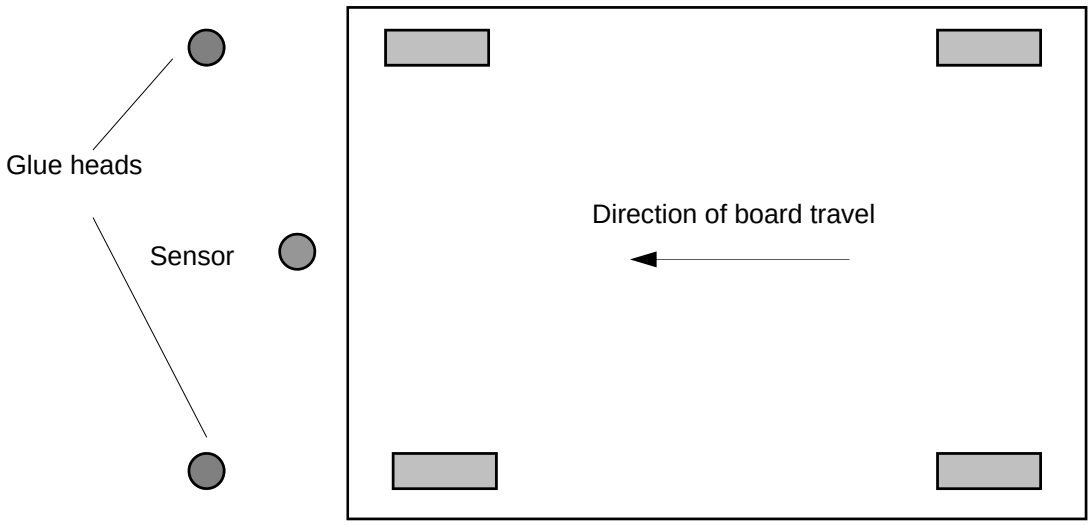
This shows an alternative installation which will allow the use of Normal or Automatic gluing because the sensor is in line with the glue head. This shows the measurements required for NORMAL gluing. Please note the change of reference point!



In this operation when AUTOMATIC is selected the GLUE RADIUS setting fixes the distance that the glue starts and stops from each end of the glue tab whatever the carton length. Adjust EDGE OFFSET to centralise the glue pattern on the glue tab.



Multi-point glue application - crash-lock and four corner gluing

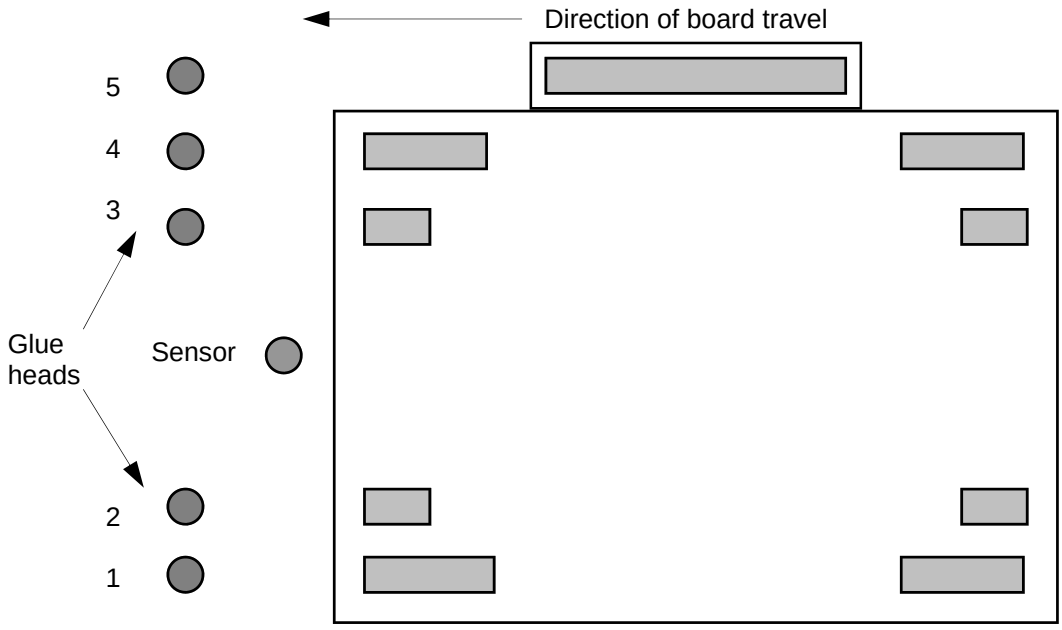


L1 Start L1 Stop L2 Start L2 Stop

Eg. 0025 - 0075 0225 - 0275

After entering the values for **L1 Start** and **L1 Stop** press the **select** switch to confirm the values and then press once more to display **L2 Start** and **L2 Stop**. Enter the values and then press the **select** switch once to confirm the settings. This example will give two glue patterns, each 50 mm long and then repeat 150 mm later and can be carried out with just two heads and a single channel controller.

Multi-head and Multi-Channel Systems



In the above example the system is driven by a 3 channel controller with five glue heads.

Channel A will be used to drive heads 1 & 4
Channel B will be used to drive heads 2 & 3
Channel C will be used to drive head 5

This set up allows greater adhesive coverage on crash lock and four corner trays with larger glue tabs. When a Channel output is not required the outputs for Air and Glue are simply switched off.