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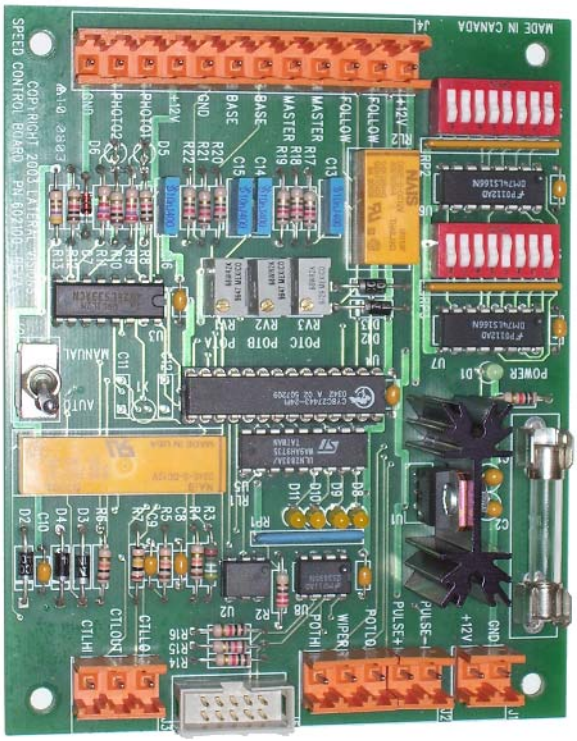
Speed Control



Speed Control User's Guide

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Speed Control

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General Information

Chapter 1

1.1 Universal Speed Control

The “Universal Speed Control” permits the control of the transport speed of multiple machines in a system from a single location. By default, the speed is controlled by the last machine in the line. Alternatively, a “Master Controller” (P/N 9104026A) can be plugged into a dedicated socket on the front panel of any machine in the system equipped to support the Speed Control Board.

The capability of implementing the Universal Speed Control is built into newer model Buskro machines, like the current model BK730 and BK7IB. For the Universal Speed Control to work, it requires that all machines in a system be equipped with the speed control board (P/N 9102421). The machines can either be ordered with the boards already installed, or they can be retrofitted in the field by a trained technician. If a machine is not already equipped with the speed control board but is capable of supporting the board, a retrofit consists of simply replacing the current “dummy” board (9103875) with the Speed Control Board and calibrating the unit. All wiring is already done and all interconnections required are already wired and connected in the machines and the interconnect cables.

The “Master Controller” may be plugged into any machine in the system, since its signals are carried on a special bus. Once the speed is set, the controller may be removed and the speed stays set until the controller is inserted into the front panel socket on any machine and the setting is changed. There can only be one “Master Controller” per line of machines.

The system synchronizes any machine to the encoder pulses from the next downstream machine, to ensure that no machine will run faster than the machine which follows it in the production stream.

The special control board obtains its input signals from a dedicated connector on the Base Control Board (J3), and the setting of the front panel Production potentiometer. It has 2 modes: manual and automatic. In the manual mode it links the Production potentiometer directly to the Inverter Driver; in the automatic mode it uses the signals from the Base Control Board to determine the desired speed and the Production potentiometer will allow a ratio of the speed to be selected (never higher than 1:1, the maximum setting of the potentiometer).

The board has a number of different operating modes (e.g. Master, Slave and Gap Control) and has to be configured and calibrated after installation.

Setup and Calibration

Chapter 2

2.1 Installation

Installation and setup of the Speed Control Board should be done by a trained technician. Before installing the Speed Control Board into any system, ensure that the power is disconnected from the machine. Reference the manual for the base you are installing the Speed Control Board into. Locate the drawing identifying the position of the Dummy Board (9103875). For example, in the BK7IB and BK730, it should be in the front instrument panel.

The purpose of the "Dummy Board" is to avoid the need to rewire the base if a Speed Control Board is installed. As a result, the Dummy Board is simply replaced with the Speed Control Board. This will only work for systems designed to support the Speed Control Board. If the base does not support a Dummy Board, it does not support the Speed Control Board.

2.2 DIP Switch Settings

The Speed Control Board has two 8-position DIP switches used to configure the operating mode.

*Table 2-1: Switch Assignments for **S2***

Switch Position(s)	Description
Position 1	**On if Photo 1 is Normally Closed**
Position 2	**On if Photo 2 is Normally Closed**
Position 5,6	**Feedback Encoder Resolution as follows** *5:6 = Off:Off* *660 DPI* *5:6 = On:Off* *600 DPI* *5:6 = Off:On* *Not Used* *5:6 = On:On* *Not Used*
Position 7,8	**Follower Encoder Resolution as follows** *7:8 = Off:Off* *660 DPI (Or for last Transport)* *7:8 = On:Off* *600 DPI* *7:8 = Off:On* *Not Used* *7:8 = On:On* *Not Used*

*Table 2-2: Switch Assignments for **S3**. Note that only 1 switch can be on at a time.*

Switch Position(s)	Description
Position 1	**On to calibrate for 0 m/s**
Position 2	**On to calibrate for 1 m/s**
Position 3	**On to calibrate for 17 inch pitch**
Position 4	**On for Follower operating mode**
Position 5	**On for Gap Control operating mode**
Position 6	**Not Used**
Position 7	**Not Used**
Position 8	**On for Master Follower operating mode**

2.3 Auto/Manual Switch

The Auto/Manual switch enables the operator to bypass the speed control board and to operate the machine as if the board were not installed. This enables a technician to quickly swap a Tabber between systems which have speed control and others which do not. The Auto configuration will enable the speed control option whereas the manual setting disables it. The switch is a toggle switch near the edge of the board.

2.4 Led Assignments

The Speed Control Board has four yellow status LEDs (Table 2-3). There is also one green status LED, D1, used to indicate that power is being supplied to the board.

Table 2-3: LED Assignments

LED	Description
D8	**Off if the speed indicated by the encoder is < 0.05 m/s** **On if the speed indicated by the encoder is > 0.05 m/s**
D9	**Off if the speed indicated by the encoder is < 1 m/s** **On if the speed indicated by the encoder is 1 m/s** **Blinks if the speed indicated by the encoder is > 1 m/s**
D10	**On if Photo 1 is Blocked**
D11	**On if Photo 2 is Blocked**

2.5 Speed Control Calibration

The Speed Control Board must be calibrated to the controlled base before it can be used. The following is the calibration procedure (reference Figure 2-1):

1. Switch the Speed Control Board **Auto/Manual** switch to **Manual.** Set the **Production Pot** on the Base to its minimum setting and start the Base. Rotate the **MIN** pot on the DART Controller so that the transport moves at about 0.05 m/s. LED D8 will turn off when the speed drops below 0.05 m/s.
2. Switch the Speed Control Board **Auto/Manual** switch to **Auto.** Set the **S3 DIP Switch** on the Speed Control Board to ***Calibrate 0.0 m/s Mode (Position 1 On).*** Start the Base and rotate the **POTA** pot on the Speed Control Board so that the transport moves at about 0.05 m/s. LED D8 will turn off when the speed is below 0.05 m/s.

   Note that if the Base is a Feeder that is not equipped with an encoder, **POTA** should be adjusted so that the Feeder operates at a ***'crawl'***.

3. If the Base is equipped with an encoder (e.g. BK7IB and BK730):
   Set the **S3 DIP Switch** on the Speed Control Board to ***Calibrate 1.0 m/s Mode (Position 2 On).*** Start the Base and rotate the **POTB** pot on the Speed Control Board so that the transport moves at 1.00 m/s. LED D9 will turn on solid when the speed is at 1.0 m/s, and it will blink if the speed is greater than 1.0 m/s.
4. If the Base is a Feeder, and Gap Control will be used:
   Set the **S3 DIP Switch** on the Speed Control Board to ***Calibrate Pitch Mode (Position 3 On).*** Start the Base and rotate the **POTC** pot on the Speed Control Board so that the Feeder feeds at 2 cycles per second. This corresponds to a 20-inch pitch when feeding onto a transport moving at 1 m/s.
5. Set the **S3 DIP Switch** on the Speed Control Board to the desired operating mode as follows.
   - If the Base is a Feeder, and Gap Control is the desired operating mode, turn **S3 Position 5** on *(all others off).*
   - If the base is the last transport in the system turn **S3 Position 8** on *(all others off).*
   - If the base is other than the last transport in the system turn **S3 Position 4** on *(all others off).*

Figure 2-1: Speed Control Board