Industronics

Design, Application and Service of Electronics in Industry

Monitron User Manual

For Version I 2.05

23 April, 2001

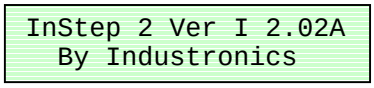
27 Wanganui Road Kirrawee NSW Australia 2232

Phone: (02) 9545 6181 Fax: +61 2 9545 6181 Mobile: 0419 267 889
Email: dpayne@ozemail.com.au WWW: http://www.ozemail.com.au/~dpayne
A division of D.H. Enterprises Pty Limited A.C.N. 087 000 995

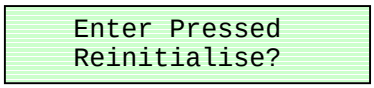
Overview

The Monitron is an upgrade for either an Impresstik Monitor on Unitron Control Box. The entire front panel and control board is replaced providing a more reliable and fully featured controller. If an older type incandescent label gap sensor was used this must be upgraded to a 24 volt fork type sensor. Apart from this, it is simply a matter of plugging the upgraded box into the old position and learning the new controls. All of the adjustments are made with three pushbuttons on the front panel. There is a two line by twenty-character LCD display for viewing the settings. Settings can also be adjusted via a serial port if this option is installed.

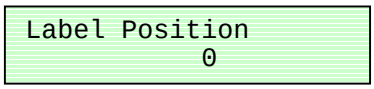
Menu Structure



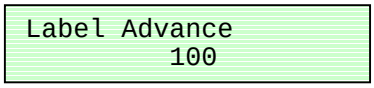
This is the opening screen. If Enter is pressed and held during this screen, the controller will display the following screen:



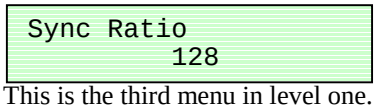
Press Enter again and all the settings will be set to factory defaults. If Enter is not pressed during the opening screen, the following menu is displayed after a ten second delay:



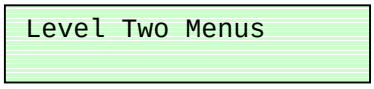
This is the first menu in level one. The Label Position setting is displayed here. This sets the delay in steps between the product sensor activation and the start of dispense effectively changing the position of the label on the product. Press Enter to enter Edit Mode, a flashing arrow is displayed to the right of the value when in edit mode. Whilst in edit mode the arrow keys can be used to adjust the value. When the correct value is displayed press Enter to leave Edit Mode. Whilst not in edit mode pressing the arrow keys moves to another menu item. Pressing the down arrow displays the following screen:



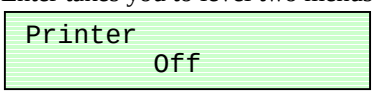
This is the second menu in level one. The Label Advance setting is displayed here. This sets the number of steps to move after the gap sensor has activated. If the deceleration is adjusted, this value must be entered again to subtract the deceleration steps from the entered advance value. Pressing the down arrow displays the following screen:



This is the third menu in level one. (If the sync ratio has been set to 255 to ignore the master encoder, the Set Speed menu will be shown here otherwise the Sync Ratio setting is displayed here). This sets the sync ratio between the master encoder and the output pulse rate, 0 is 50%, 239 is 800%. A value of 255 causes the master encoder to be ignored and the set speed value to take effect. Always use 255 in a converted Monitor as no encoder connection is present. Pressing the down arrow displays the following screen:



This is the fourth menu in level one. Pressing the down arrow displays the Label Position menu. Pressing Enter takes you to level two menus and displays the following screen:



This is the first menu in level two. The Printer setup is shown here. Pressing Enter cycles through the settings: Off, Moving Type and Stationary Type. Pressing the down arrow displays the following screen:

```
Manual Dispense
Press Enter to Start
```

This is the second menu in level two. Pressing Enter starts a label cycle. Pressing the down arrow displays the following screen:

```
Length Measure
```

This is the third menu in level two. At the completion of each dispense cycle the dispensed label length is shown here. Pressing the down arrow displays the following screen:

```
Missing Label Mode
      Enabled
```

This is the fourth menu in level two. Pressing Enter cycles between Enabled and Disabled. Pressing the down arrow displays the following screen:

```
Set Speed
           0
```

This is the fifth menu in level two. (If the sync ratio has been set to 255 to ignore the master encoder, the Sync Ratio menu will be shown here otherwise the Set Speed setting is displayed here). This is the dispense speed when no master encoder is used, i.e. Sync Ratio set to 255. A value of zero gives a very slow dispense speed while values approaching 9999 give a very fast speed. Very high values can cause the drive to stutter and should be avoided. Pressing the down arrow displays the following screen:

```
Two Label Spacing
           0
```

This is the sixth menu in level two. The Two Label Spacing setting is displayed here. This setting sets the number of steps to pause between the first and second label of a set. A value of 0 turns this function off. Pressing the down arrow displays the following screen:

```
Spin Up Delay
           0
```

This is the seventh menu in level two. The Spin Up Delay setting is displayed here. This setting can enable one of two modes. A value of 1 puts the InStep into "Jig Only Mode". In this mode the normal product sensor is ignored and the sequence is started by the "Jig In" input. When a larger value is entered, the "Orient Jig Mode" is turned on. This command sets the number of steps to pause before the registration scanner is enabled. This is to ensure the product is spinning in the jig at the correct speed. In orient jig mode the normal product scanner is ignored and the cycle is initiated by a sensor connected to the "Jig In" input. This initiates the spin up delay. When this is complete, the sensor connected to the "Colour Sensor" input is enabled. When the colour sensor sees a leading edge the normal dispense sequence is started. A value of 0 turns both jig modes off. Pressing the down arrow displays the following screen:

```
Air Blast Time
           0
```

This is the eighth menu in level two. The Air Blast Time setting is displayed here. This menu sets the air blast time in milliseconds. The air blast is for machines with an air box attachment. The air blast time occurs after the product delay and before the label starts to move. In version I 2.02 any value here causes a 64ms air blast time. Pressing the down arrow displays the following screen:

```
Level Three Menus
```

This is the ninth menu in level two. Pressing Enter takes you to level three menus and displays the Acceleration menu. Pressing the down arrow displays the following screen:

```
Level One Menus
```

This is the tenth menu in level two. Pressing Enter takes you to level one menus and displays the Label Position menu. Pressing the down arrow displays the Printer menu.

```
Acceleration
          3
```

This is the first menu in level three. The Acceleration setting is displayed here. This menu selects 1 of 6 acceleration ramp profiles. A value of 5 is the softest, 3 is normal. Pressing the down arrow displays the following screen:

```
Deceleration
         10
```

This is the second menu in level three. The Deceleration setting is displayed here. This menu adjusts the number of steps to decelerate over. This setting is read-only at present. Pressing the down arrow displays the following screen:

```
Inputs:  PGDSPFJC
         00000000
```

This is the third menu in level three. The input status is displayed here. A value of 1 indicates the input is on, 0 is off. The letters above the value indicate what the input is used for.
P – Product Sensor
G – Gap Sensor
D – Disable Input
S – Servo OK
P – Printer OK
F – Fixed Pull Input
J – Jig In / Product Gate Input
C – Colour Sensor
Pressing Enter updates display.
Pressing the down arrow displays the following screen:

```
Outputs: XFABJMEC
         00000000
```

This is the fourth menu in level three. The output status is displayed here. A value of 1 indicates the output is on, 0 is off. The letters above the value indicate what the input is used for.
X – Spare
F – Fault Output
A – Air Assist Output
B – Air Blast Output
J – Jig Solenoid Output
M – Missing Label Output
E – Servo Enable / Stepper Boost Output
C – Coder (Printer) Output
Pressing Enter updates display.
Pressing the down arrow displays the following screen:

```
Master Speed
          0
```

This is the fifth menu in level three. The speed of the master encoder is displayed here. Pressing Enter updates display. Pressing the down arrow displays the following screen:

```
Options: GSFEC421
         00000000
```

This is the sixth menu in level three. The option status is displayed here. A value of 1 indicates the option is on, 0 is off. The letters above the value indicate what the input is used for.
G – Gate Signal Required
S – Servo Mode (Not Stepper)
F – Frequency Doubler
E – Enable at Power On
C – Moving Type Coder (Not Stationary Type)
421 – Serial Address Select (Set bits to total to desired address)
Pressing Enter takes you into edit mode.
Pressing the down arrow displays the following screen:

```
Level Two Menus
```

This is the seventh menu in level three. Pressing Enter takes you to level three menus and displays the Printer menu. Pressing the down arrow displays the following screen:

```
Level One Menus
```

This is the eighth menu in level three. Pressing Enter takes you to level one menus and displays the Label Position menu. Pressing the down arrow displays the Acceleration menu.

Note: Some of the signals required to allow some modes to function are not brought out to the plugs on the Monitron. However, they are available on the terminal strip on the adapter board. Contact Impresstik Machinery for details.

Serial Communications

Communications with the InStep module is via the serial port located on an optional adapter board.
If RS-485 is used up to 8 modules may be daisy chained together to allow one master device to communicate with all units using only one communication port. The address of each unit is selected via the Options menu. Commands are issued by the master device in the system and the modules either simply act on this command or respond if it was a query type command.
All messages to and from the InStep modules have the following field format:
Header, Address, Command, Optional value and Carriage return.
e.g.; 1P2AB<CR>
Where,

- The semicolon character (3B hex) is the header. All messages on the network begin with this header character.
- 1 is the address on the network. The PLC or computer, etc is always address zero. Jumpers on the option port set the address of the InStep units. The valid range is 1 to 8.
- P is the command. All messages from the master have this field. All responses from the InStep modules do not have this field.
- 2AB is the value. Whether this field exists and its width depends on the command. All responses from the InStep modules have this field.
- <CR> is the message terminator. All messages are terminated by a carriage return (0D hex) character.

Some commands are queries only and so no value field is allowed.
Some command values are in decimal ASCII others are in hexadecimal ASCII.
All response values are in hexadecimal ASCII.
All command letters and hex digits A to F must be in upper case.
Leading zeroes are not required in commands.
Leading zeroes are always returned to the width of the value field.
Space and Line Feed characters in commands are ignored.
Responses are always directed to address zero.
Out of range characters in data will cause unpredictable results. (i.e. other than 0 to 9 and A to F)

Command Descriptions

A - Advance

Function Sets the advance value or queries the current value.
Range 0 to 65,535 decimal in command, 0 to FFFF hexadecimal in response.
Default 10
Description This command sets the number of steps to move after the gap sensor has activated. If the decel (F command) is adjusted this value must be entered again to subtract the decel steps from the entered advance value.

B - Batch Count *Not implemented yet (Temporary use implemented)*

Function Sets or queries the batch counter. (Sets fixed move length).
Range 0 to FFFFFF hexadecimal. (0 to 65,535 dec in command, 0 to FFFF hex in response).
Default 0
Description This command forces a value into the batch counter register. Normally used to reset the count. (Sets the length in steps of the move done when the fixed move input is activated).

C - Total Count *Not implemented yet*

Function Sets or queries the total counter.
Range 0 to FFFFFF hexadecimal
Default 0
Description This command forces a value into the total counter register. Normally used to reset the count.

D - Coder Delay *Partial implementation*

Function Sets or queries the coder delay.
Range 0 to FFFF
Default 0
Description This command sets the delay in steps between either the start of dispensing or the stopping and the print signal coming on depending on the type of batch coder selected.
At the moment 0 disables and any value enables with a small delay. As of 1.19D odd values cause checking for a printer OK signal at IN4, even values look for a printer faulty signal.

E - Enable

Function Enables the dispensing of labels.
Range 0 or 1
Default Depends on state of J28. (Refer to Option Port Table)
Description When set to 1 enables the dispensing of labels at the next product sensor activation or when set to 0 disables the dispensing of labels at the end of the currently dispensing label. Also used to reset a missing label fault shutdown.

F - Forward label *Not implemented yet (Temporary use implemented)*

Function Allows the labeller to skip over a missing label to prevent one product not being labelled. (Number of Deceleration Steps after advance finished.)
Range 0 to FF
Default 0 or off (0A)
Description The number of labels between the gap sensor and the peeler bar is set here. When the missing label approaches the peeler bar a double length index is performed to skip over the missing label allowing all products to be labelled. (Temporarily used for number of deceleration steps. Re-enter advance after changing this value!)

G - Manual Dispense (Go)

Function Starts the label sequence independent of the product sensor.
Range No value allowed!
Default N/A
Description This command allows the operator to dispense a label without having to operate the product sensor.

H - Batch Preset *Not implemented yet*

Function Sets or queries the batch preset value.
Range 0 to FFFFFF hexadecimal
Default 0 or off
Description This command sets the count at which the batch counter will activate the output and reset the counter.

I - Input Port Status

Function Returns a value indicating the status of the input port.
Range No value allowed!
Default N/A
Description This command returns two hex digits representing the status of the 8 bit input port. A value of 00 is all off. Refer to the port assignment tables for the function of each input.

J - Jig Delay *Not implemented yet*

Function Sets or queries the jig delay.
Range 0 to 65,535 decimal in command, 0 to FFFF hexadecimal in response.
Default 0 or off
Description This command sets the steps between product detection and activating the jig solenoid output when in orientation jig mode.

K - Air Blast Time

Function Sets or queries the air blast time.
Range 0 to 255 decimal in command, 0 to FF in response.
Default 0 or off
Description This command sets the air blast time in milliseconds. The air blast is for machines with an air box attachment. The air blast time occurs after the product delay and before the label starts to move. In current versions, any value here causes a 64ms air blast time.

L - Length Measuring

Function Turns the length measuring function on or off.
Range 0 or 1
Default 0 or off
Description This command turns the length measuring function on or off. When turned on the number of steps to dispense the label is transmitted to the master device shortly after the label is dispensed. Value returned is number of steps in hexadecimal.

M - Master Speed

Function Queries the speed of the master encoder.
Range No value allowed!
Default N/A
Description This command allows the user to check the operation of the master encoder. To convert the value returned into a rate in kHz, divide the value into 1000 decimal.
i.e. Speed (kHz) = 1000/Value. If value is 1F4 then 1000/500 = 2kHz.
Note: This is the time between the last two encoder pulses so when the encoder has a stopped a value will still be indicated.

N - Missing Label Mode *partial implementation*

Function Turns missing label detection on or off.
Range 0 to 2
Default 0
Description This command allows the user to turn the auto-sizing missing label detection on or off. If a missing label is detected an output is set and enable turned off. A value of 2 causes complete disable of missing label protection. Only used for testing! At present only modes 0 and 2 function. (1 gives mode 0)

O - Output Port Status

Function Returns a value indicating the status of the output port.
Range 0 to FF hexadecimal
Default N/A
Description This command allows the user to force the state of the output port bits. As a query it returns two hex digits representing the status of the 8-bit output port. A value of 00 is all off. Refer to the port assignment tables for the function of each output.

P - Label Position

Function Sets or queries the label position value.
Range 0 to 65,535 decimal in command, 0 to FFFF hexadecimal in response.
Default 0
Description This command sets the delay in steps between the product sensor activation and the start of dispense effectively changing the position of the label on the product.

Q - Stop Dispense (Quit)

Function Used to stop the dispense of a label.
Range No value allowed!
Default N/A
Description This command stops the label dispense independent of the gap sensor.

R - Ramp Select

Function Sets or queries the acceleration ramp.
Range 0 to 5
Default 3
Description This command selects 1 of 6 acceleration ramp profiles. A value of 5 is the softest.

S - Set Speed

Function Sets or queries the set speed
Range 0 to 9999 in command, 0 to FFFFFF hexadecimal in response.
Default 300 hex, 9231 dec.
Description This command sets the speed of dispensing when no master encoder is used. Sync ratio of zero (serial) must be set for this value to take effect. A value of zero gives a very slow dispense speed while values approaching 9999 give a very fast speed.

T - Two Label Spacing

Function Sets or queries the two label spacing value
Range 0 to 65,535 in command, 0 to FFFF in response.
Default 0 or off
Description This command sets the number of steps to pause between the first and second label of a set. A value of 0 turns this function off.

U – Spin Up Delay

Function Sets or queries the spin up delay.
Range 0 to 65,535 in command, 0 to FFFF in response.
Default 0 or off
Description This command can enable one of two modes. A value of 1 puts the InStep into “Jig Only Mode”. In this mode the normal product sensor is ignored and the sequence is started by the “Jig In” input. When a larger value is entered, the “Orient Jig Mode” is turned on. This command sets the number of steps to pause before the registration scanner is enabled. This is to ensure the product is spinning in the jig at the correct speed. In orient jig mode the normal product scanner is ignored and the cycle is initiated by a sensor connected to the “Jig In” input. This initiates the spin up delay. When this is complete, the sensor connected to the “Colour Sensor” input is enabled. When the colour sensor sees a leading edge the normal dispense sequence is started. A value of 0 turns both jig modes off.

V - Version

Function Queries the version number of the installed firmware.
Range No value allowed!
Default N/A
Description This command returns the installed firmware's version number in the following format:
A letter to indicate the type.
A major version number followed by a decimal point.
Two minor version digits to indicate revision level.
A space or letter to indicate special versions.

W - Option Port (DIP Switch)

Function returns a value indicating the option port status.
Range No value allowed!
Default N/A
Description Returns two hex digits representing the status of the 8-bit option port, refer to the port assignment tables for the jumper functions. A value of 00 is all off. Also used to load a new setting. Bit 0 corresponds to J24.

X - Examine RAM

Function Returns the value stored at the specified RAM address.
Range 0 to FF hexadecimal
Default N/A
Description This command is for debugging purposes only and requires an intimate knowledge of the firmware to interpret the responses.

Y - Synchronisation Ratio

Function Sets or queries the sync ratio
Range 0 to 255 decimal in command, 0 to FF in response.
Default 128 decimal (80 hex) or 100%
Description This command sets the sync ratio between the master encoder and the output pulse rate FF is 50%, 10 is 800% Refer to table for correct value. A value of 0 causes the master encoder to be ignored and the set speed value to take effect. This command is opposite to the values set via the LCD.

Z - Internal Port

Function Returns a value indicating the internal port status or can force output bits.
Range 0 to FF
Default N/A
Description Returns two hex digits representing the status of the 8 bit internal port, refer to the port assignment tables for individual bit functions and states. A value can be written to the port in order to force the state of the output bits on that port, the input bits remain unaffected.

Inputs

All inputs are selectable for NPN (1 to 2) or PNP (2 to 3) input devices. The function of each input follows.

PRODSENS - Product Sensor

This input initiates the labelling sequence. It starts with a transition from off to on of this input. See jumper J7 for input polarity selection. Terminal 1 on a Monitron.

GAPSENS - Gap Sensor

This is the registration input. It is normally connected to a fork sensor that detects the gap between the labels on the backing paper. The label advance starts counting with an off to on transition of this input. See jumper J8 for input polarity selection. Terminal 2 on a Monitron.

ENC - Master Encoder

This is where the encoder for the product speed is connected. The encoder is usually coupled to the conveyor or vacuum belt of the machine. See jumper J12 and J13 for input polarity selection and J11 for voltage. The pulses per rev of the encoder and its gearing to the conveyor / belt should be selected so that the rate is the same as the step rate of the motor. It is best to be on the low side of one to one if this cannot be achieved. The encoder should have an open collector 5 or 24VDC output. Terminal 16 on an ex Unitron.

IN1 – Colour Sensor (Product Sensor 2)

This input only functions in Orientation Mode. It triggers the labelling cycle just as the normal product scanner does however only after the orient part of the cycle is complete. See jumper J1 for input polarity selection. Terminal 4 on a Monitor adapter boards TB1.

IN2 – Jig In Sensor/Product Gate

This input is usually a proximity detector mounted on the orientation jig to indicate when the jig is closed. It initiates the spin up delay in orient jig mode. If option port jumper J31 is installed this input becomes the product sensor gate input. In this mode this input must be on before a product detection will start the dispense cycle. See jumper J2 for input polarity selection. Terminal 5 on a Monitor adapter boards TB1.

IN3 – Fixed Pull Input

This input initiates the fixed move cycle. This move simply accelerates at the set rate then moves for the amount of steps set by the “B” command. This move is made irrespective of the gap sensor. See jumper J3 for input polarity selection. Terminal 6 on a Monitor adapter boards TB1.

IN4 – Printer OK

This input is connected to the printer OK/fault output of the printer controlled by the InStep module. When the printer is enabled by the Coder Delay (D) command with an odd value this input must be on otherwise the InStep is disabled and the bussed fault output is turned on. If an even value is used in D the input must be off for printer OK. See jumper J4 for input polarity selection. Pin 2 of CON3 on a Monitor adapter Board.

IN5 - Reset

Not implemented yet. Terminal 7 on a Monitor adapter boards TB1.

IN6 - Disable (Bussed Fault In)

This input disables the labelling on a transition from off to on. Even if the input is left on the unit may be re-enabled via the "E1" command. See J6 for input polarity selection. Terminal 8 on a Monitor adapter boards TB1

Outputs

All outputs are selectable for NPN or PNP however they must all be one or the other. Selection is made by changing IC9. For NPN use ULN2803A, for PNP use UDN2981A. Jumpers J9 and J10 must be set to suit. In a Monitron, the IC is PNP but the main outputs have slave transistors that provide a NPN output.

STEP – Step Signal

This output is used to drive the pulse input of the stepper or servo drive. Connected internally.

OUT1 – Coder

This output is the start trigger for a date coder etc. Option Menu selects whether the coder is of the type that prints while the web is stationary (e.g. hot stamp) or moving (e.g. ink jet). Terminal 6 on a Monitron.

OUT2 – Servo Enable/Stepper Boost

This output is connected internally to the stepper drive to control the boost function on the D550.

OUT3 – Missing Label (Labeller Fault)

This output is turned on when a missing label has been detected. It is reset by pressing Enter in the fault screen or by sending the "E1" command. Terminal 9 on a Monitor adapter boards TB1.

OUT4

Not implemented yet. Pin 2 of CON4 on a Monitor adapter board.

OUT5 – Air Blast

When an air blast time is entered in the menu or with the K command, this output is turned on at the end of the product delay and before the servo starts to move. Terminal 11 on a Monitron.

OUT6 – Air Assist

This output is turned on at the start of the servo moving and off at the beginning of deceleration. Terminal 9 on a Monitron.

OUT7 – Bussed Fault Out

This output is turned on when there is a labeler fault or a printer fault. Terminal 10 on a Monitor adapter boards TB1

InStep Command Summary

Command	Without Data	With Data	Data Range	Default
A	Returns Advance Value	Sets Label Advance	0 to 65535	100 dec
B	Returns Batch Count	Sets Batch Count	0 to 65535	0
C	Returns Total Count	Sets Total Count	0 to FFFFFF	0
D	Returns Coder Delay	Sets Coder Delay	0 to FFFF	0
E	Returns Enable Status	Sets Enable On or Off	0 or 1	0
F	Returns Forward Label Value	Sets Forward Label Count	0 to FF	0A hex
G	Manual Dispense (Go)	Returns ?<BELL><CR>	N/A	N/A
H	Returns Batch Preset Value	Sets Batch Preset	0 to FFFFFF	0
I	Returns Input Port Status	Returns ?<BELL><CR>	0 to FF	N/A
J	Returns Jig Delay	Sets Jig Delay	0 to 65535	0
K	Returns Air Blast Time	Sets Air Blast Time	0 to 255	0
L	Returns Length Measure Status	Sets Length Measure On or Off	0 or 1	0
M	Returns Master Speed	Returns ?<BELL><CR>	0 to FFFFFF	N/A
N	Returns Missing Label Status	Sets Missing Label On or Off	0 or 1	0
O	Returns Output Port Status	Sets Output Port Bits	0 to FF	N/A
P	Returns Label Position Value	Sets Label Position	0 to 65535	0
Q	Manual Stop Dispense (Quit)	Returns ?<BELL><CR>	N/A	N/A
R	Returns Selected Ramp	Selects Acceleration Ramp	0 to 5	3
S	Returns Set Speed	Sets Set Speed	0 to 9999	9231 d
T	Returns Two Label Spacing Value	Sets Two Label Spacing	0 to 65535	0
U	Returns Spin Up Delay Value	Sets Spin Up Delay	0 to 65535	0
V	Returns Firmware Version	Returns ?<BELL><CR>	A0.00 to Z9.99Z	N/A
W	Returns Option Port Status	Returns ?<BELL><CR>	0 to FF	N/A
X	Returns ?<BELL><CR>	Returns RAM value	0 to FF	N/A
Y	Returns Sync Ratio	Sets Sync Ratio	0 to 255	128 dec
Z	Returns Internal Port Status	Sets Internal Port Output Bits	0 to FF	N/A
Any Other	Returns ?<BELL><CR>	Returns ?<BELL><CR>		

Synchronisation Value Table

Sync Percent	Serial Value	Menu Value	Sync Percent	Serial Value	Menu Value
50	255	0	160	80	175
60	213	42	170	75	180
70	183	72	180	71	184
80	160	95	190	67	188
90	142	113	200	64	191
100	128	127	250	51	204
110	116	139	300	42	213
120	106	149	400	32	223
130	98	157	600	21	234
140	91	164	800	16	239
150	85	170	Use Set Speed	0	255

Tuchel 16 way Rear Panel Connector

Connector Pin Number	Signal	Machine Terminal	Comment
1	Product Scanner	3	
2	Gap Scanner	4	Must be new 24 volt type
3	Ground	2	
4	No Connection	6	5.5 volts for old gap scanner not supported
5	Ground	5	
6	Printer	7	
7	24 Volts	1	Use for scanner power
8	No Connection		24 Volts in an ex Unitron
9	Air Assist	9	
10	24 Volts for above	8	Special unregulated voltage in an ex Monitor
11	Air Blast	11	
12	24 Volts for above	10	Special unregulated voltage in an ex Monitor
13	No Connection		
14	No Connection		
15	No Connection		
16	Master Encoder	16	Only wired to adapter board in an ex Unitron

Stepper Motor Rear Panel Connector

Connector Pin Number	Signal	Stepper Drive Pin	Comment
A	W2E	20c	Winding 2 Start
B	W4E	22c	Winding 4 Start
C	W1A	24c	Winding 1 Finish
D	W3A	26c	Winding 3 Finish
E	W5A	28c	Winding 5 Finish
F	W1E	20a	Winding 1 Start
G	W3E	22a	Winding 3 Start
H	W5E	24a	Winding 5 Start
I	W2A	26a	Winding 2 Finish
J	W4A	28a	Winding 4 Finish

Adapter Board Terminal Strip TB1

Terminal Number	Signal	Description
1	Spare 1	Depends on Option Board (RS-232 TxD)
2	Spare 2	Depends on Option Board (RS-232 RxD)
3	Spare 3	Depends on Option Board
4	IN 1	Colour Sensor (Product Sensor 2)
5	IN 2	Jig In Sensor / Product Gate
6	IN 3	Fixed Pull
7	IN 5	Servo OK
8	IN 6	Disable
9	OUT 3	Missing Label
10	OUT 7	Fault
11	ENC	Master Encoder
12	Flap Adapt	Flap Adapter (Driven by OUT4)
13	+24Vdc	
14	0V	

Note: Terminal strip not normally fitted.

InStep II Jumper Descriptions

Jumper	Description	Default
J1 to J8	These three point jumpers select the polarity of the signal required to operate the inputs. Jump 1 to 2 for sinking (NPN) type input devices. Jump 2 to 3 for sourcing (PNP) type input devices. J1 to J6 correspond to input 1 to 6 respectively. J7 is for the product sensor input. J8 is for the label sensor input.	1 to 2 jumpered
J9 and J10	These jumpers are set to match the type of output driver IC installed in position IC9. Jump both 1 to 2 for NPN type IC (ULN2803A) Jump both 2 to 3 for PNP type IC (UDN2981A) Note: jumpers must be set correctly or damage will result!	2 to 3 jumpered
J11	Install Jumper 11 when 5 volt encoder is used. J12/13 must be in PNP configuration when this jumper is installed!	Not fitted
J12 and J13	These jumpers are set to match the polarity of the output of the master encoder connected to terminal 11. Jumper J12 and J13 1 to 2 for NPN output encoders. Jumper J13 2 to 3 and J12/1 to J13/1 for PNP output encoders.	J12, 1 to 2 jumpered J13, 1 to 2 jumpered
J14 to J24	These jumpers set the master encoder divisor. J14 is divide by one, J14 is divide by 2 through to J24 which is divide by 1024. Only one jumper in this set to be installed!	J14 installed

Monitor Adapter Board Jumpers

Jumper	Description	Default
A,B	Jump A to provide NPN output on CON2 pin 16 for stepper boost signal. Jump B to provide PNP 14 volt output on CON2 pin 16 for TFM enable, 14 volts must be brought in on CON2 pin 8. Only one jumper to be installed!	A jumpered
CON3	IN4. Provided to copy original PCB. Not sure what it was used for. Possibly gap edge select, not supported in software.	N/A
CON4	OUT4. Flap Adapter Output. Has BD681 NPN driver.	N/A
CON5	OUT6. Air Assist Output. Often used to drive label counter.	N/A

Stepper Drive DIP Switch

	Berger Lahr D550		Layson L550	
Switch	Use	Description	Use	Description
1	Boost/PWM	Off = Boost Control	Step Angle	?? = Full Step (500 steps)
2	Current Reduction	Off = Current Reduction On	Direction	?? = Clockwise
3	Direction	Off = Counter Clockwise	Not Used	
4	Step Angle	Off = Half Step (1000 step)	Not Used	

Rotary switch on D550 set to F for maximum current.

InStep Version Update Summary

Version I2.02 - 22/10/1999

Changes: First released version.
Fixes: None.
Additions: None.

Version I2.03 - 27/01/2000

Changes: The Set Speed serial command was changed so that the value entered corresponds to the value entered in the LCD screen. If the Sync Ratio is set to 255 on the LCD (or 0 with serial command) the positions of the Sync Ratio and Set Speed Menus swap. This was done to make speed adjustment easier in an ex-Monitor control.
Fixes: None.
Additions: None.

Version I2.04 - 12/04/2000

Changes: Reinitialise now initialises to Monitron defaults, as this version will not be used for Servotron Boxes.
Fixes: Reinitialise fixed and LCD write routines adjusted. None of these affects the manual.
Additions: None.

Version I2.05 - 08/03/2001

Changes: None.
Fixes: Stepper boost now works when using manual dispense.
Additions: None.