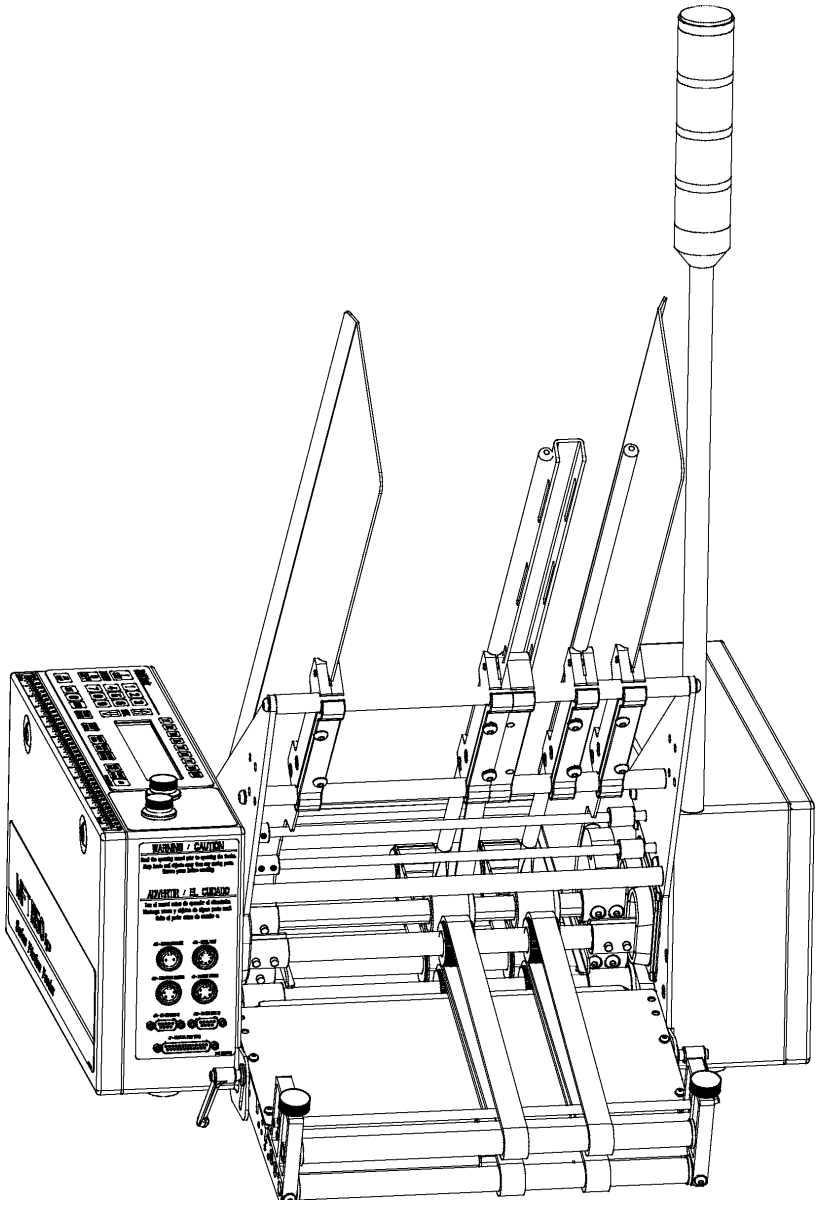
IP Feeder

Technician Manual

P/N 39030-0C



Multifeeder Technology, Inc. 4821 White Bear Parkway, St. Paul, MN 55110

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www.multifeeder.com

READ FIRST

This equipment requires operation at all times by properly trained personnel in accordance with all the applicable operation and maintenance manuals using approved procedures and product.

Customer Reference and Contact Log

Reference Information

Model Number _____

Serial Number _____

Software Ver. _____

Contact information
Multifeeder Technology, Inc.
4821 White Bear Parkway
St. Paul, MN 55110

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Contact Log

Date	Spoke with at MFT	About

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EQUIPMENT SAFETY WARNINGS

All equipment from Multifeeder Technology (MTF) is designed with safety in mind. However, in order to ensure your safety and the safety of others around you, common sense must always be used when operating this machine. Please read this section of the manual carefully before installing or operating your MTF System.

Personal Safety Warnings

These warnings are given to help you avoid personal injury

Do not install or operate your MFT Feeder without first reading this manual completely.

This Feeder operates on 110 or 220 VAC. Contact with this voltage can lead to serious injury, or death.

Always properly shut down and disconnect the power cord before removing any housing covers for service or inspection.

Always properly shut down and disconnect the main power cord before working with any electrical components.

Always properly shut down and disconnect the power cord before reaching into the any area of the Feeder to perform maintenance tasks.

Make sure loose jewelry, clothing, long hair, neckties, etc. is properly secured before you operate the system.

Do not operate the Feeder, make mechanical adjustments, or perform maintenance tasks while under the influence of drugs or alcohol.

Keep hands away from moving parts at all times while the Feeder is operating.

Always properly shut down the Feeder before reaching into moving area of the machine to perform setup tasks, make mechanical adjustments, or clear jams.

Be aware of the location of the STOP MOTOR button. In case of an emergency, this may be depressed at any time to instantly stop the motor.

Use proper lifting techniques when moving this machine.

Be aware of static electricity build up on products being fed.

EQUIPMENT SAFETY WARNINGS

Equipment Precautions

These precautions are given to avoid damage to the MFT Friction Feeder

Do not install or operate your Feeder without first reading this manual completely.

Always properly shut down and disconnect the power cord before removing any housing covers for service or inspection.

When moving the Feeder, do not lift by the discharge table or shafts.

Make sure the Feeder components are securely mounted before enabling the operation.

Use only fuses of the correct type, voltage, and current ratings.

To turn off any control boxes, always press the red OFF button on the membrane keypad before turning off the machine with the mechanical switch if so equipped.

Do not stack items on the machine when it is not in use.

Always properly shut down and disconnect the power cord before performing any setup tasks or making mechanical adjustments.

Perform regular maintenance as prescribed in manual. Failure to do so may result in injury and/or damage to the machinery.

Maintenance tasks and mechanical adjustments should be performed according to the methods described in this manual by properly trained personnel.

This system should be operated within the following environmental range: Temperature 10-35^{o}C (50-95^{o}F), the recommended relative humidity range is 30% to 60% with 80% maximum, non-condensing.

This system should be operated in a well-lit area.

All power and signal cables should be secured before operating the Feeder.

All loose tools and material should be removed from the equipment before operating the Feeder.

Installation and Setup

1 Signal Light

2 Product Support Curve (see Figure 4)

3 Product Rod

4 Magazine Side Plate

5 Magazine Side Plate

6 Magazine Side Plate Screw (Knob)

7 Feed Belt

8 Discharge Belt

9 Stripper Wheel

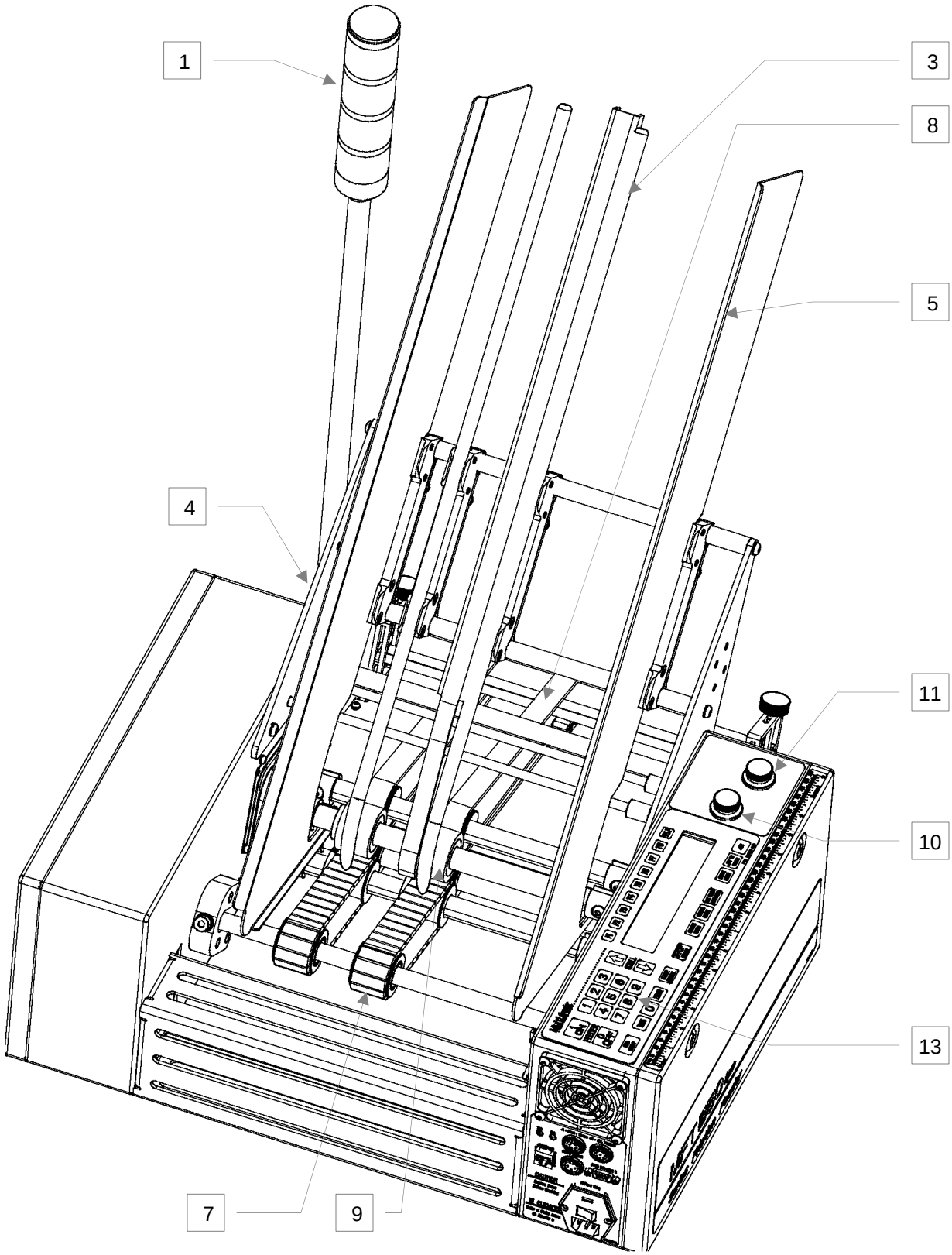
10 Stripper Wheel Height Adjustment Knob

11 Discharge Height Adjustment Knob

12 Product Sensor Pair (Not Visible)

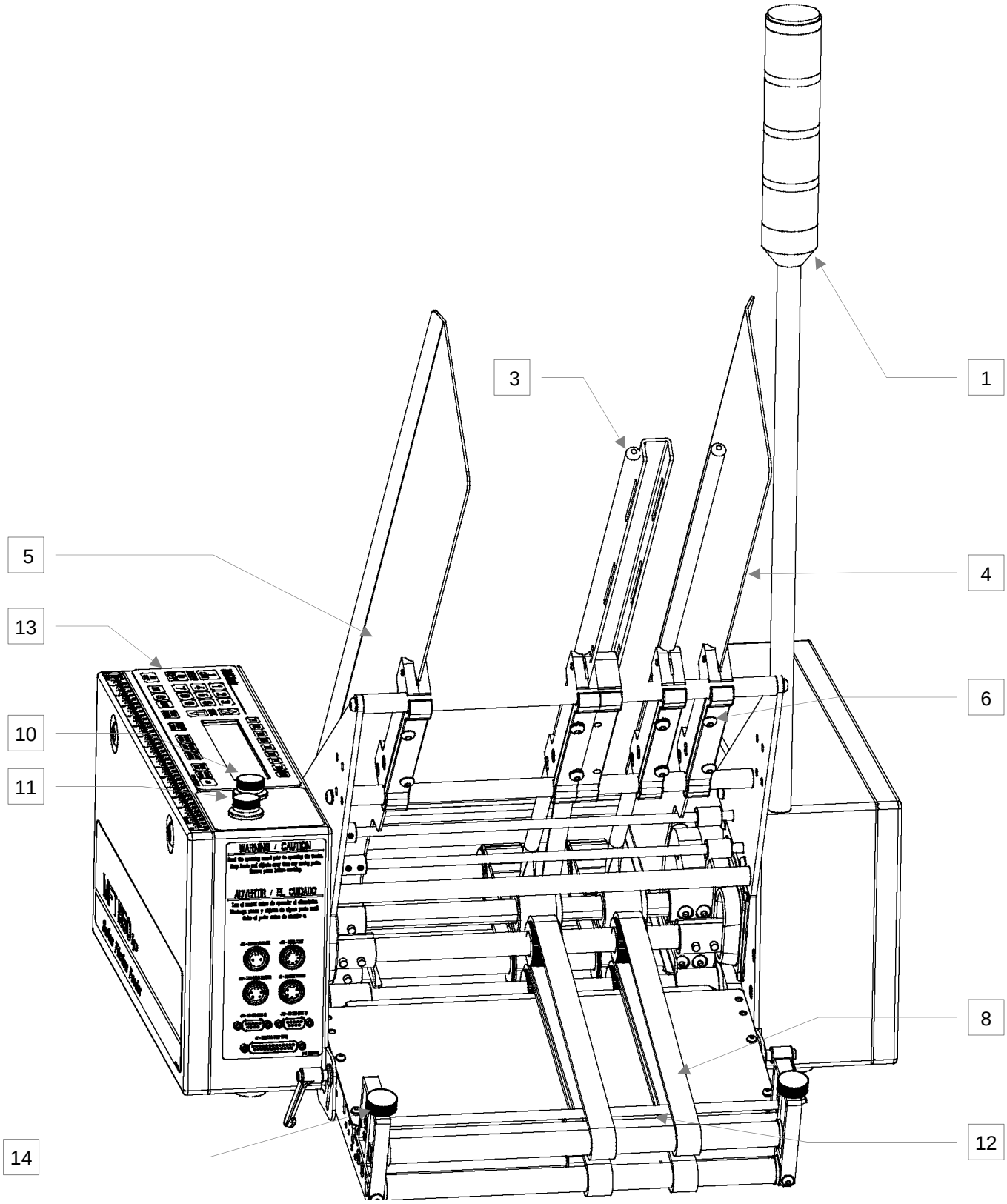
13 Keypad

14 Discharge Height Adjustment Knob



Rear View of MFT Friction Feeder

Figure 1



Front View of MFT Friction Feeder

Figure 2

Installation and Setup

NOTE! Before installing the *Feeder,* check your packing slip to make sure your shipment contains all items as specified. If your shipment is missing any items, please contact MFT. If items have been damaged during shipment, contact the shipper or trucking company immediately.

MFT Feeder Installation

The numbers in parentheses refer to the items in Figure 1 (a rear view of the *Feeder)* and Figure 2 (a front view of the *Feeder*). The numbers on each figure are identical.

1. Using appropriate means of lifting carefully remove the *Feeder* assembly from its box and place it in its correct operating position and direction.

2. Use a Multifeeder Technology Stand-On-Rollers and compatible mounting hardware or mounting provided by the user to securely mount the friction *Feeder.*

3. Install the *Product Support Curve* (2, Figure 4). *Product Support Curve* (2) should be placed on the top of the slotted housing frame bracket for small products and on the back of the housing frame bracket for large products.

4. Install the *Product Support Rod(s)* (3). Each *Product Support Rod(s)* (3) should be mounted as shown in Figure 4. Position the *Product Support Rod* (3) so that the curved sharpened tip faces inward and is aligned with the center line of the *Feed Belt* (7) and that it does not touch either the *Stripper Wheel* (9) or *Feed Belt* (7). If two or more *Product Support Curves* (2) are used, they should be positioned at identical heights and locations with respect to the *Stripper Wheels* (9) and *Feed Belts* (7).

5. Install the *Magazine Side Plate* (4) and (5). Place one *Magazine Side Plate* (4) and (5) on the outside of the far right *Feed Belt* (7) assembly and one on the outside of the far left *Feed Belt* (7) assembly.

NOTE! The magazine plate lips should funnel inward towards the feed belts.

6. If ordered, install the Low Product Sensor (not pictured). Plug the Low Product Sensor into the J3-Low Product connector located on the back of the electrical *Feeder* housing.

7. If ordered, install the Photo-Optic / Proximity Start Sensor (not pictured). Plug the start sensor into the J1-start status connector located on the back of the electrical *Feeder* housing.

MFT Feeder Setup

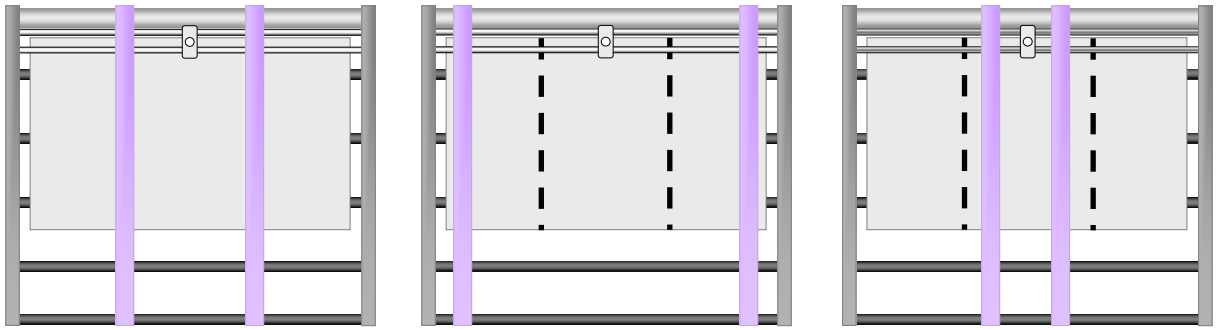
Before you begin the setup procedure, be certain that the *Feeder* motor is disabled. This can be accomplished either by turning the power off on the main power switch or by pressing the FEEDER OFF key on the membrane keypad. (The LCD display remains ON in this mode but displays FEEDER OFF - PRESS ON TO ENABLE). The numbers in parentheses () refer to the items in Figure 1 and Figure 2. Figure 1 is a rear view of the *Feeder* and Figure 2 is a front view of the *Feeder.* The numbers on each figure are identical.

Feed and Discharge Belt Location

Position the *Feed Belts* (7) and *Discharge Belts* (8) according to the following table

Feed belt & Discharge Belt Settings						
Number of Feed Belt Assemblies	1	2	3	4	5	6
Fold product into	2	3	4	5	6	7

Below is an example of belt placement on a feeder with two belts. Center the belts on the fold represented by the dotted lines in the illustration below.



Correct **Incorrect** **Incorrect**

Equal belt spacing ensures a uniform product discharge. If the product discharge is non-uniform, the user needs to consider the non-uniformities inherent in belt placement. For example, if a raised portion exists on the product, MFT recommends not positioning belts over the raised portion. For a uniform product requiring two belts, the following configuration is recommended: testing will help determine the best configuration for belt placement.

1. To position the belts, first locate the setscrews on the discharge pulleys and the main feed belt pulleys. Use a 2.5 mm metric Allen wrench to loosen the setscrews on the pulleys.

2. After the setscrews are loose, position the discharge pulleys, the main feed belt pulleys, and the free-floating pulleys according to the instructions above.

3. Position the *Stripper Wheels* (9) such that they are directly above each of the feed belts. To move the *Stripper Wheels (9),* first locate the setscrews. Insert a 2.5mm metric Allen wrench into the set screw heads and turn counterclockwise to loosen.

4. Position the *Product Support Rod* (3) so that products can pass between the bottom of the *Product Support Rod* (3) and the *Feed Belts* (7) as follows:

    a) For very thin products (0.05mm - 0.25mm): Adjust the height of the *Product Support Rod* (3) so that the distance between the *Feed Belt* (7) and the sharpened tip of the *Product Support Rod* (3) equals a stack of 10-20 products, approximately 2-5 mm.

    b) For medium products (0.25mm - 2mm): Allow a distance of 6-15 products, approximately 3mm - 8mm.

c) For medium thick products (2mm - 4mm): Allow a distance of 3-10 products, approximately 5-10 mm.

d) For thick products (4mm - 6.25mm): Allow a distance of 2-5 products, approximately 8-15 mm.

e) For very thick products (6.25mm - 26mm): Allow a distance of 1 product, approximately 15mm - 30mm.

Note: Depending on your familiarity with the feeder setup it may be advantageous to remove the *Magazine Side Plate* (5) closest to the control panel by loosening the *Twist Knobs* (6) in Figure 1 for easier viewing of set up.

5. Use the *Stripper Wheel Height Knob* (10) to adjust the *Stripper Wheel* (9) height allowing one product between the *Stripper Wheels* (9) and the *Feed Belts* (7). Adjust the *Stripper Wheel* (9) for slight resistance as you slide the product between the *Stripper Wheels* (9) and the *Feed Belts* (7). The product should be moveable using only two fingers and yet have noticeable resistance to pulling.

   a) If the gap between the *Stripper Wheels* (9) and the *Feed Belts* (7) is too tight, rotate the *Stripper Wheel Height Knob* (10) clockwise to reduce the pressure.

   b) If the gap between the *Stripper Wheels* (9) and the *Feed Belts* (7) is too loose, rotate the *Stripper Wheel Height Adjustment Knob* (10) counter clockwise to increase the pressure.

6. Insert one product between the top and bottom *Discharge Belts* (8) in the entrance of the discharge section. Use the *Discharge Height Adjustment Knob* (11) to adjust the height of the top discharge belts using the same procedure described in step 6. Ideally, the grip on the product in the discharge section will be slightly looser than that in the stripper wheel section.

7. Insert one product between the top and bottom discharge belts at the discharge exit area. Use the *Discharge Height Adjustment Knob* (14) at the end of the discharge table to adjust the product pressure as you did in steps 6 and 7. The pressure on the product at the discharge exit should be the same as the pressure at the discharge entrance (step 7). It is very important that the pressures on the left and right sides of the product are equal. In other words, the discharge exit roller shaft must be level. You can check that the pressures are equal by dragging the product by its left and right tip until you feel equal pressure.

Note: If the product skews as it feeds, there is too much pressure on the product.

8. Position the *Product Sensor Pair* (12) to properly and reliably read the product as it passes through the *Feeder.* It is very important that the emitter and receiver of the *Product Sensor Pair* (12) are inline with one another. This simply means that the emitter and receiver are vertically aligned. A good position requires that the emitter and receiver not be too close to an edge or near a place on the product with slots, clear areas or holes. For example: In Figure 3 the *Product Sensor Pair* (12) placed in the center of the product and avoids the “Hole” as the product flows through the *Feeder*.

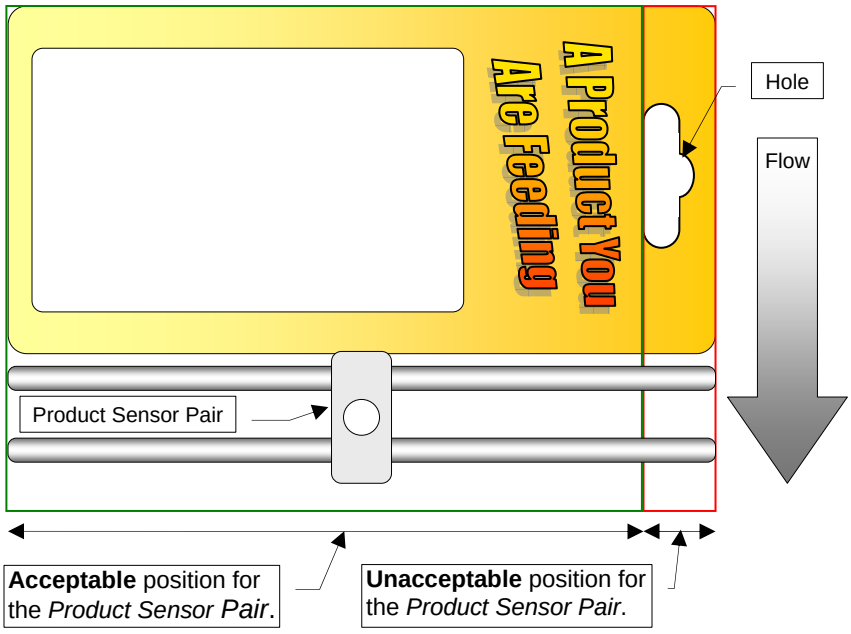


Figure 3

9. Press the FEEDER ON (see p. 21) hot key to enable the *Feeder.*

10. Once at the ready screen access the *Feeder's* menu options by pressing the MENU key on the membrane *Keypad* (13). Select the Product Feeding Length menu by pressing the "1" key. Measure the length of the product being fed and enter the value. Refer to p.29 for further information on how to enter the product feeding length.

11. Press the CHANGE SPEED hot key and enter a value of 100.

12. Press the CHANGE COUNT hot key and enter a value of 1.

13. Take a small stack of products (6-10 products) and place it in the product magazine with the front end of the bottom product lying on the *Feed Belts* (7) facing the *Stripper Wheels* (9). Adjust the *Product Support Curve* assembly (2) to support the products similar to the illustration in Figure 4. Note that for larger products the product stack may only be resting on the product support curve tip and its shoulder. Note also that for larger products the *Product Support Curve* (2) assembly can be mounted on the back of the housing frame bracket.

14. Press JOG and observe the spacing between the products as they exit the *Feeder.* To fine-tune the stripper wheel adjustment, check the product spacing by the *Product Sensor Pair*.

    a) < 12mm (1/2"): Decrease the height of the *Stripper Wheels* with respect to the *Feed Belts* by rotating the thickness adjuster knob (10) counter clockwise.

    b) > 50mm (2"): Increase the height of the *Stripper Wheels* with respect to the feed belt by rotating the thickness adjuster knob (10) clockwise.

15. Position the *Product Support Curves* (2) so that the distance from the *Product Support Rods* (3) is slightly more than the product length (see Figure 4). The product support curves should be positioned to lift some of the weight off the *Feed Belts* (7) while they guide the product. Be careful <u>not</u> to let the *Product Support Curves Touch* (7) the *Feed Belts* (9). This will lead to premature feed belt wear.

16. Add approximately 50mm (2in) of additional product to the initial stack.

17. Press the JOG key to observe that the product properly and consistently falls onto the *Feed Belts* (7) and that the product feeds correctly. Adjust the *Product Support Curve* (2) if necessary to improve the performance.

18. Press the JOG key to position one product between the *Product Sensor Pair* (12).

19. Press the SET PROD THICKNESS hot key to store the product thickness in the Feeder's memory.

20. Reinstall the *Magazine Side Plate* (5) if remove. The *Magazine Side Plate* (4) and (5) should be symmetrical with respect to the center of the *Feeder* and allow approximately 3mm (1/8") on each side of the product stack. This enables the product to pass downward freely.

21. Load magazine with product and press the JOG key to observe the distance between the products as they are fed.

    a) < 12mm (1/2"): Rotate or increase the height of the *Product Support Curve* (2) to decrease the weight of the product on the *Feed Belts* (7). It may also be necessary to slightly decrease the height of the *Stripper Wheels* (9) with respect to the *Feed Belts* (7).

    b) > 50mm (2"): Rotate or decrease the height of the *Product Support Curve* (2) to increase the weight of the product on the *Feed Belts* (7). It may also be necessary to slightly increase the height of the *Stripper Wheels* (9) with respect to the *Feed Belts* (7).

22. Press the JOG TO CLEAR key to test feeding. Check to be sure the product is coming out straight and that there is approximately 12mm (1/2") to 50mm (2") of space between products when they are between the *Product Sensor Pair* (12).

23. Use the CHANGE SPEED hot key to enter the production speed and the CHANGE COUNT hot key to enter the production count.

24. Press the JOG TO CLEAR key to test feeding again. Once more, check to be sure that the product is coming out straight and that there is approximately 12mm (1/2") to 50mm (2") of space between products when they are between the *Product Sensor Pair* (12).

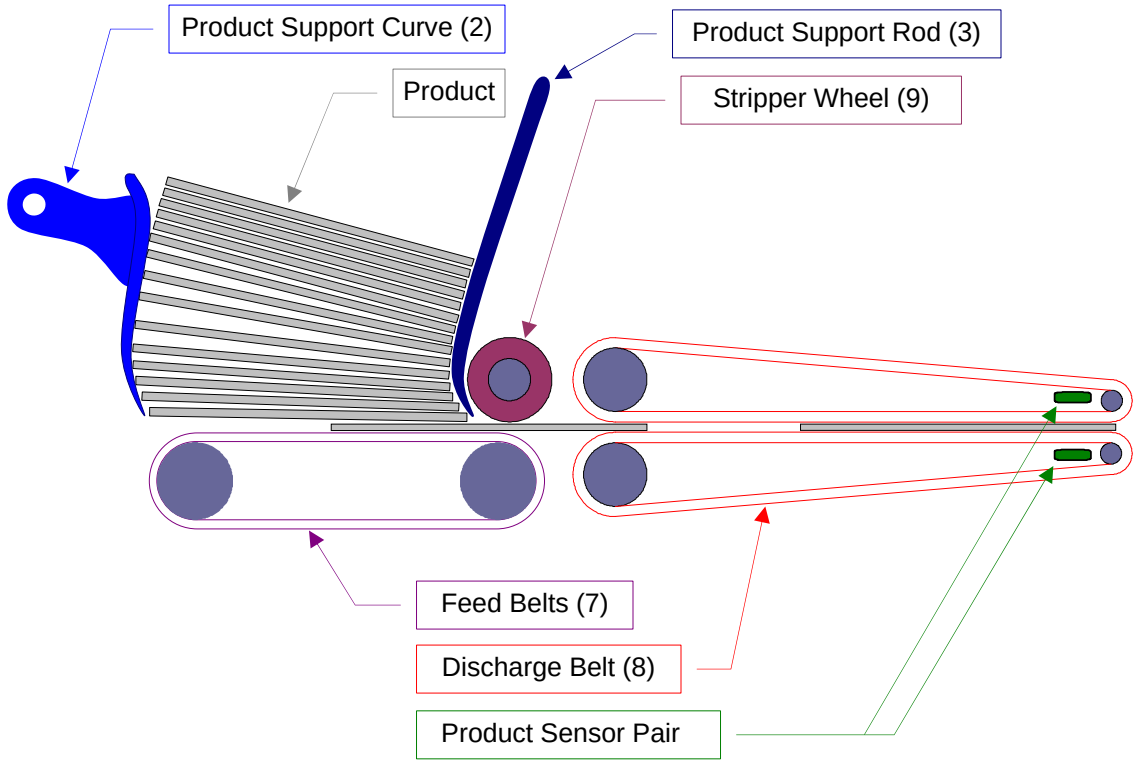
25. If using a product sensor to trigger the feed cycle, set the Feeder to Auto On with the AUTO ON/OFF key or press CYCLE START to begin feeding without a product sensor.

Feeder Tips

1. Product Support Curve (2): The support curve should be placed as shown in the drawing for most products. When working with products that are difficult to feed, the support curve can be raised to reduce the product weight on the feed belts. Let the products feed with low stripper wheel pressure.

2. Clean *Stripper Wheels* (9) Regularly: Clean at the start of each shift. Dip a clean rag in isopropyl alcohol. Press firmly and wipe the surface of each stripper wheel from side to side all the way around each wheel.

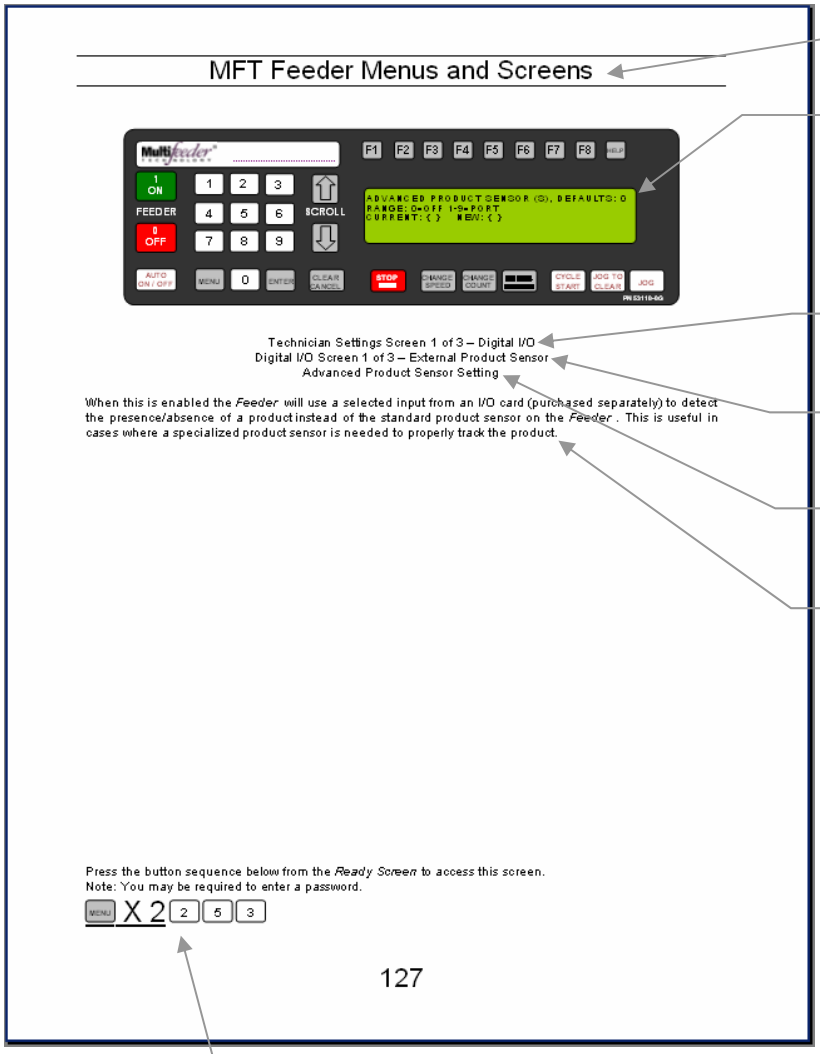
3. *Adjusting Stripper Wheels* (9): Adjust the height of the stripper wheel shaft until you feel slight resistance as you slide one product between the *Stripper Wheels* and the *Feed Belts*. When the *Feeder* is loaded with a stack of product, the stripper wheel setting can be checked by rotating the stripper wheel shaft. If the wheels turn freely the pressure is too light. If the shaft cannot be turned with slight resistance, the pressure is too high. **Do not over tighten the *Stripper Wheels.***



Side View Sketch of the MFT Friction Feeding Principle

Figure 4

How To Use This Manual



Section Title

Screen Shot of Control Box

Note: "{ }" are used to display variable values of the actual screen.

Main Menu Heading

Sub Menu Heading

Setting Title (When Applicable)

Setting Details **2**

Use the button sequence to arrive at the screen depicted at the top of the page.

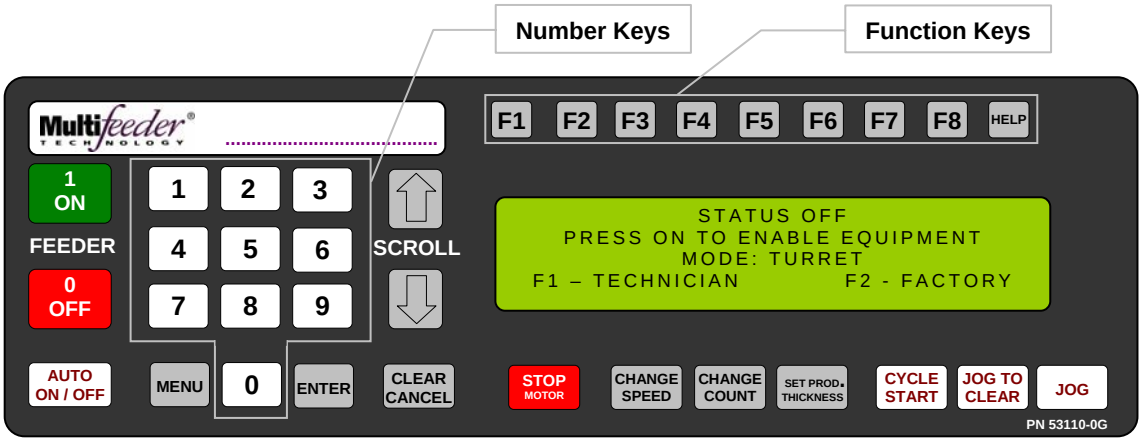
Note: Repetitive button depressions are represented by "MENU X 2". This in indicates to press the underlined button the amount of times after the "X".

Note:
Values can be displayed in meters, feet or revolutions per minute. Examples in this manual are in meters.

Feeder Menu Matrix

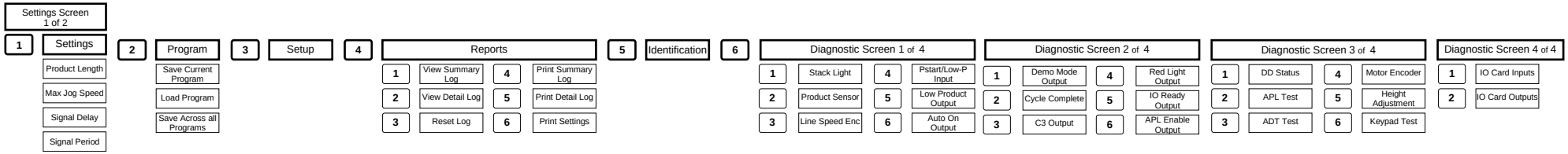
Controls and Key Pad

Key Pad Controls

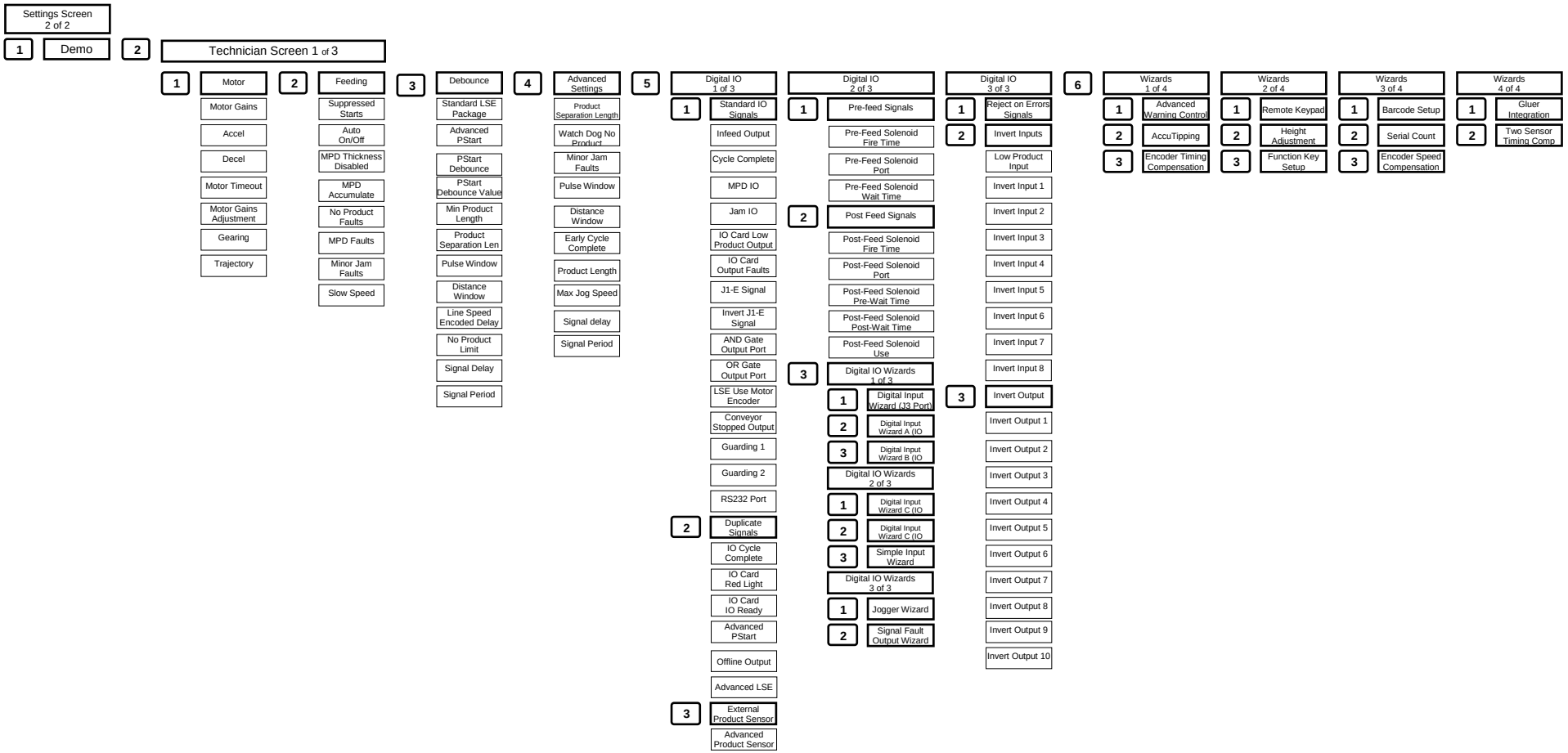


1 ON	Used to start up control box software after mechanical power switch is turned on.
0 OFF	Used to shut down control box software before mechanical power switch is turned off.
AUTO ON / OFF	Used to enable/disable external triggering.
MENU	Used to enter and navigate menu options.
ENTER	Used to enter menu and value choices.
CLEAR CANCEL	Used to clear errors or cancel functions
⇩ ⇧	Used to navigate menu options.
STOP MOTOR	Used to stop motor functions.
CHANGE SPEED	Used to change motor speed.
CHANGE COUNT	Used to change count value.
SET PROD. THICKNESS	Used to set product thickness of the sensor pair.
CYCLE START	Used to start a cycle.
JOG TO CLEAR	Used to automatically position a product under the sensor pair.
JOG	Used to jog the motor.
Number Keys	Used to input values and for menu navigation.
Function Keys	Used as direct access key for frequently used menus.

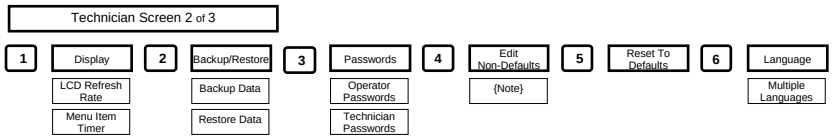
Feeder Menu Matrix



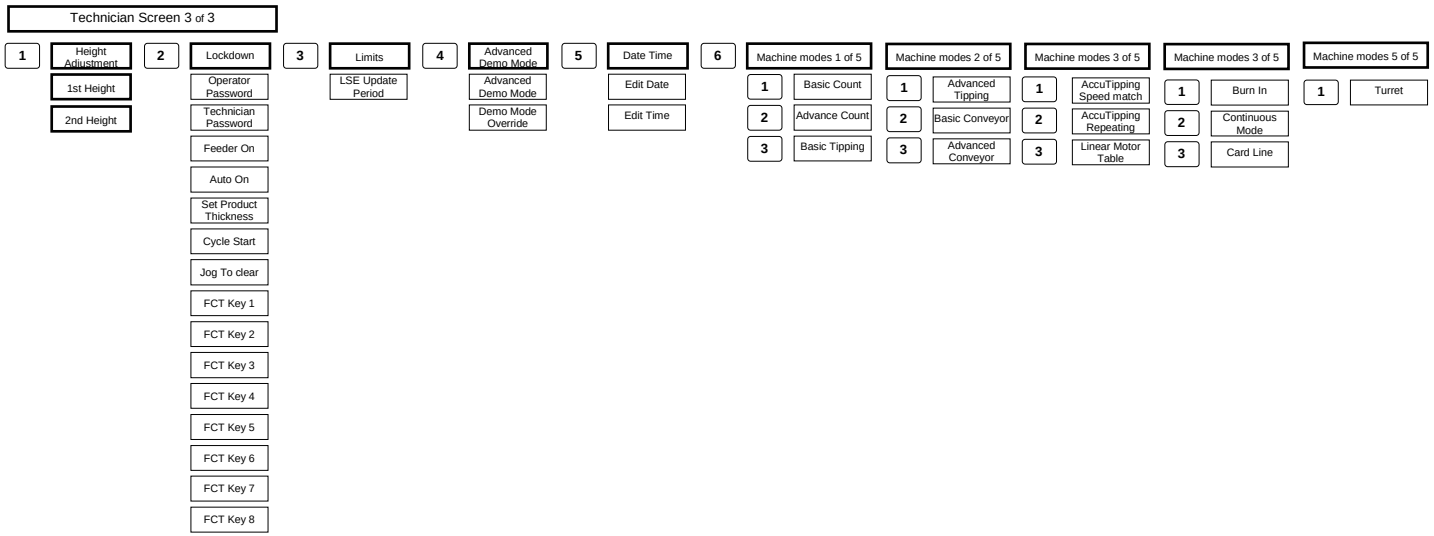
Feeder Menu Matrix

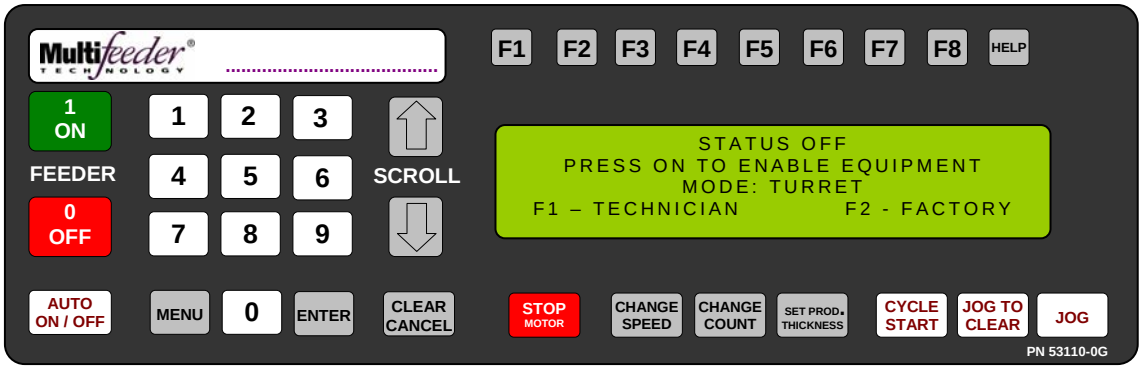


Feeder Menu Matrix



Feeder Menu Matrix





Power Up Screen

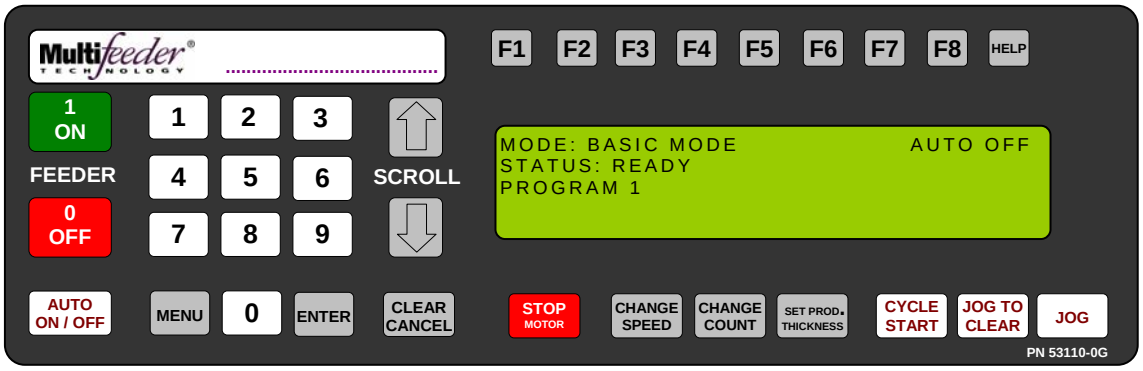
The *Power Up Screen* is displayed after the switch on the power enter module is turned on and after the software loads. There are three options on the *Power Up Screen*.

1. Pressing the 1 ON button advances to the *Ready Screen.*

2. Pressing the button advances to the *Technician Settings Screen.*

3. Pressing the F2 button advances to the *Factory Settings Screen.*

Note: A password is required to access menu screens.



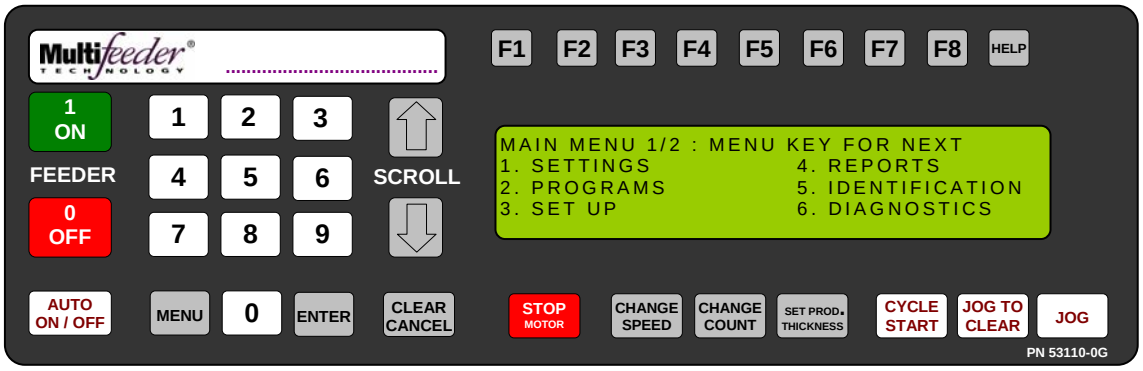
Ready Screen

The *Ready Screen* is displayed when the control box is ready to be to be run.

Note: The third line down may toggle between three states.
1. PROGRAM {NUMBER}
2. SPEED {XXX} MPM [XXFPM]
3. LOW PRODUCT

Press the button sequence below from the *Ready Screen* to access this screen.

Power on switch + 1 ON



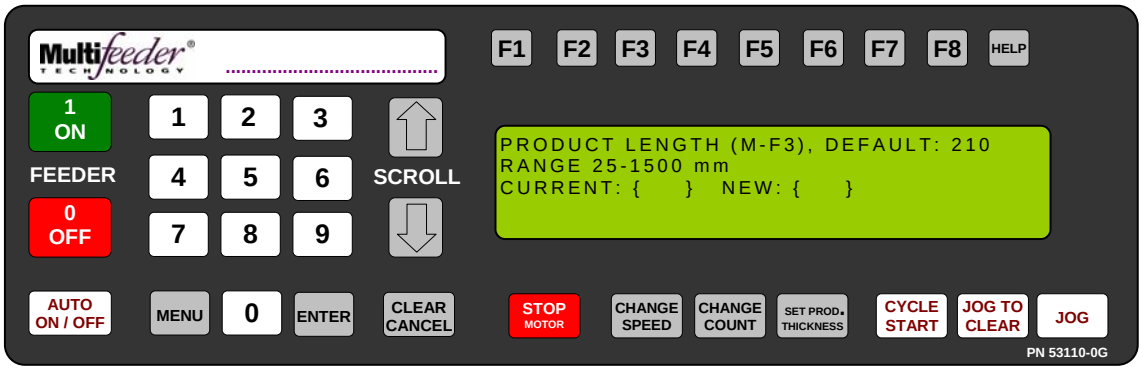
Main Menu Screen
1 of 2

The Main Menu Screen is displayed when the MENU button is pressed. Use the number keys on the keypad to advance to corresponding setting.

1. SETTINGS
2. PROGRAMS
3. SET UP
4. REPORTS
5. IDENTIFICATION
6. DIAGNOSTICS

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU

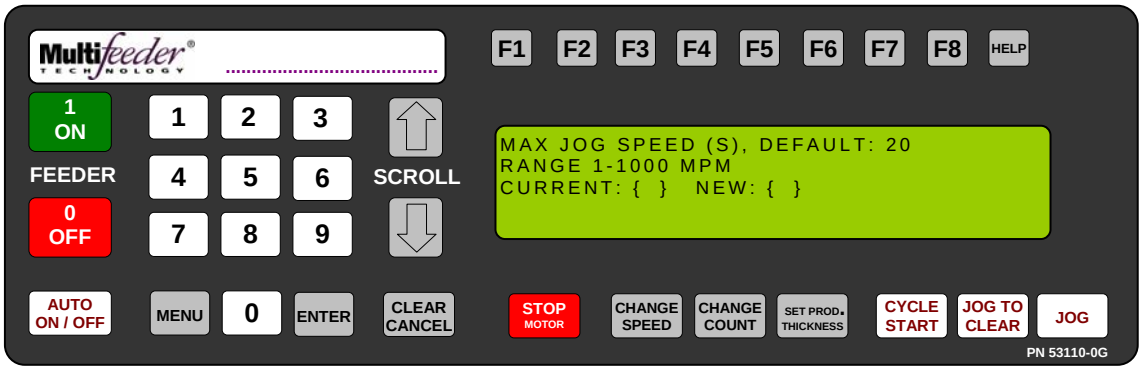


Settings Screen 1
Product Length

Menu 1 allows the user to store, in the computer's memory, the length of the product being fed. The computer then checks for product jams and multiple product feeds. Menu 1 may be selected by pressing the "1" key while any of the MENU option screens are shown. When Menu 1 is selected, the program displays the allowable product length range (25mm-1500mm), the current product length, and prompts the user to enter the new product length as shown in the figure above. For your convenience, a ruler has been placed on the *Feeder* housing directly below the membrane keypad. Please note that the product length must be entered in millimeters (25mm = 1in).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 1

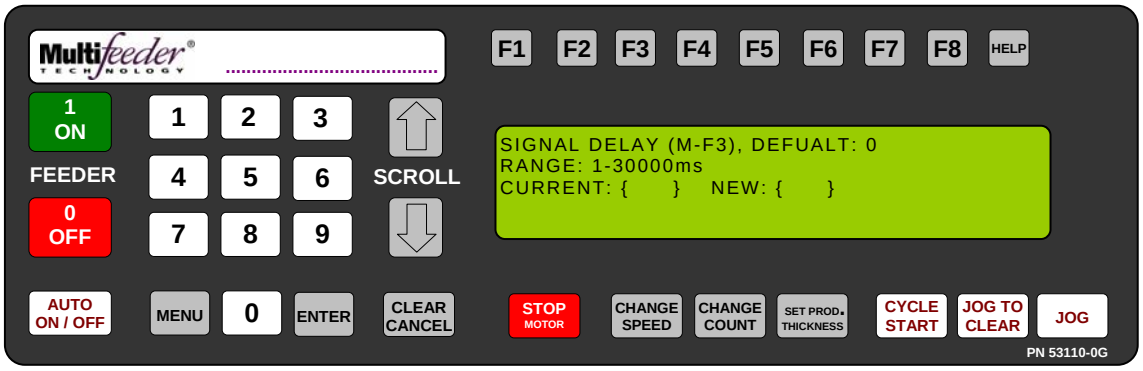


Settings Screen 1
Maximum Jog Speed

The Max Jog Speed screen allows the user to control the maximum speed at which the Feeder will operate when used in the JOG mode. This function is particularly useful when the "operating" speed is set very high and the user would like the option to jog at a lower speed. However, it is important to note that this function controls the *maximum* jog speed. In other words, when the operating speed is set at a lower speed than the Max Jog Speed, the Feeder will jog at the operating speed. The Max Jog Speed screen shows the allowable Max Jog Speed range (1-100 MPM), the current Max Jog Speed value, and prompts the user to enter a new value. The recommended Max Jog Speed is 20 MPM.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 1 MENU

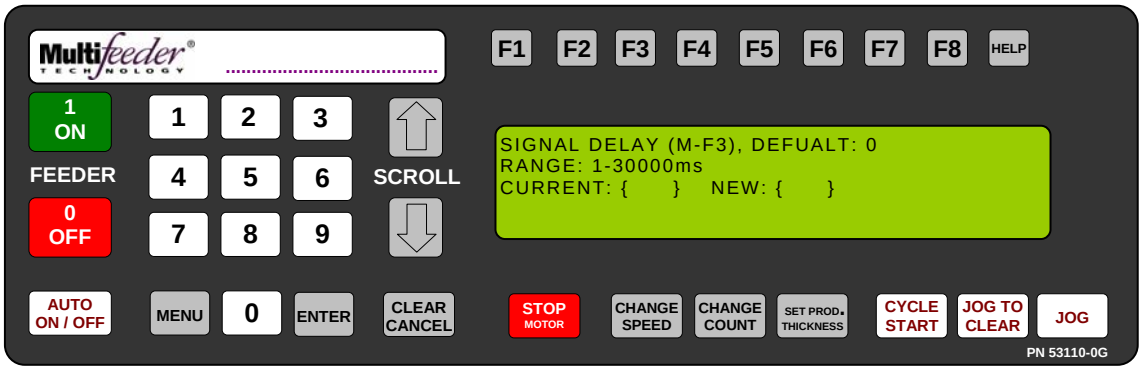


Settings Screen 1
Signal Delay

The Signal Delay screen gives the user the option of delaying the acknowledgment of the start pulse at the start connector. This function is used primarily when the *Feeder* is integrated with another machine. The signal may be delayed from 0 milliseconds to 1000 milliseconds (1 second). When the delay is set to 0 the start pulse will be acknowledged immediately.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 1 MENU X 2

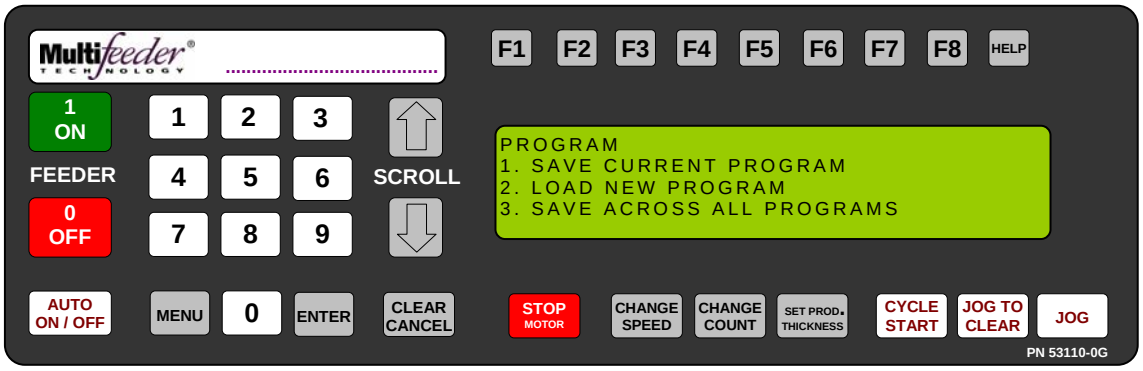


Settings Screen 1
Signal Period

The Signal Period screen gives the user the option of ignoring from 1 to 10,000 start pulses between accepted start pulses. Again, this function is used primarily when the *Feeder* is integrated with another machine. If the Signal Period is set to 0 each start pulse will be accepted.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 1 MENU X 3



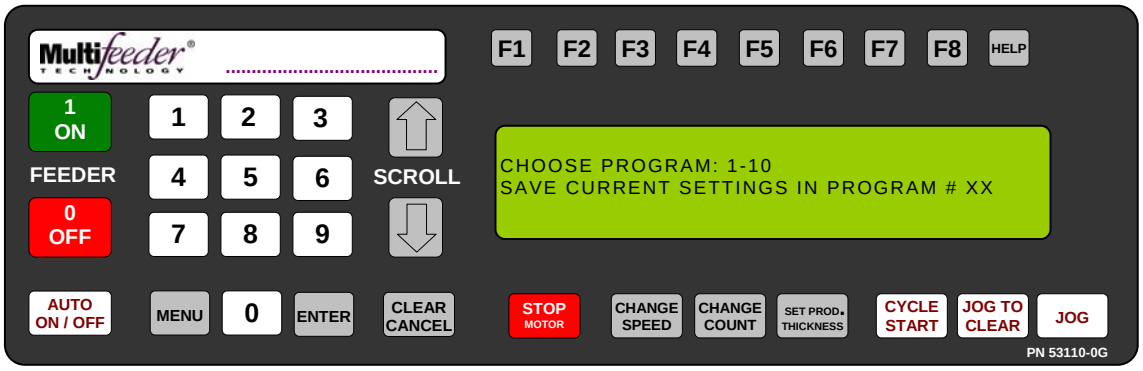
Program Menu Screen

The screen is the *Program Menu Screen*. Use the number keys on the keypad to advance to corresponding setting.

1. SAVE CURRENT PROGRAM
2. LOAD NEW PROGRAM
3. SAVE ACROSS ALL PROGRAMS

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password..

MENU 2



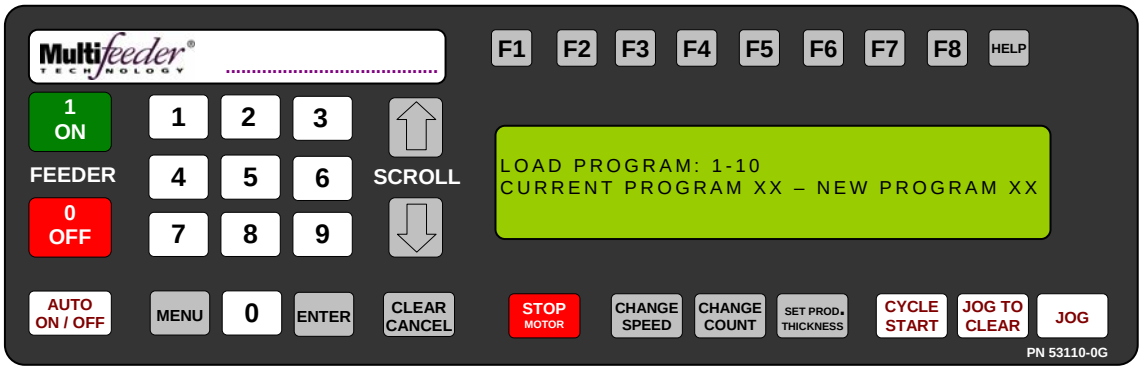
Program Menu Screen
Save Current Program

The screen is the *Save Current Program Menu Screen*. Use the number keys on the keypad to select the program number the settings will be saved to.

This screen allows the user to save the current *Feeder* settings, including Product Feeding Length, Speed, Product Count, Product Thickness, and Watch Dog Length as a feeding program. The settings unique to a specific product may then be easily recalled at any time. This is particularly useful if several different products are run on the same machine.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 2 1

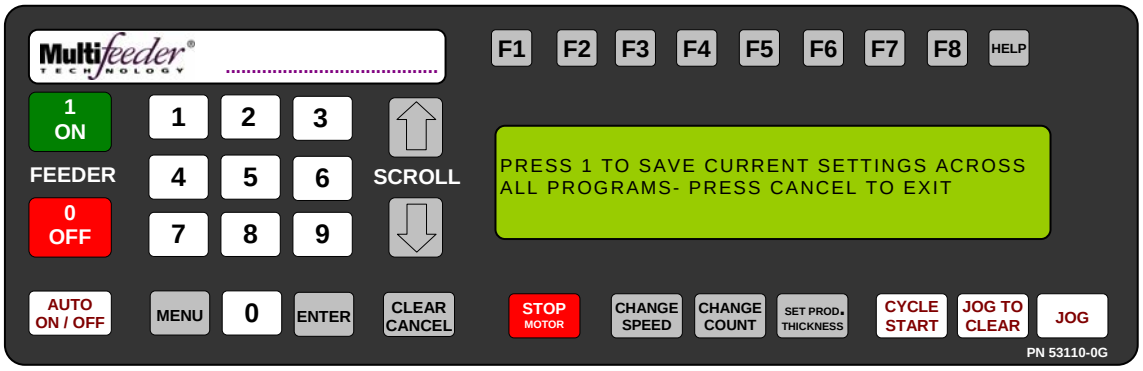


Program Menu Screen
Load Program

The screen is the *Load Program Menu Screen*. Use the number keys on the keypad and press enter to load a different program.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 2 2

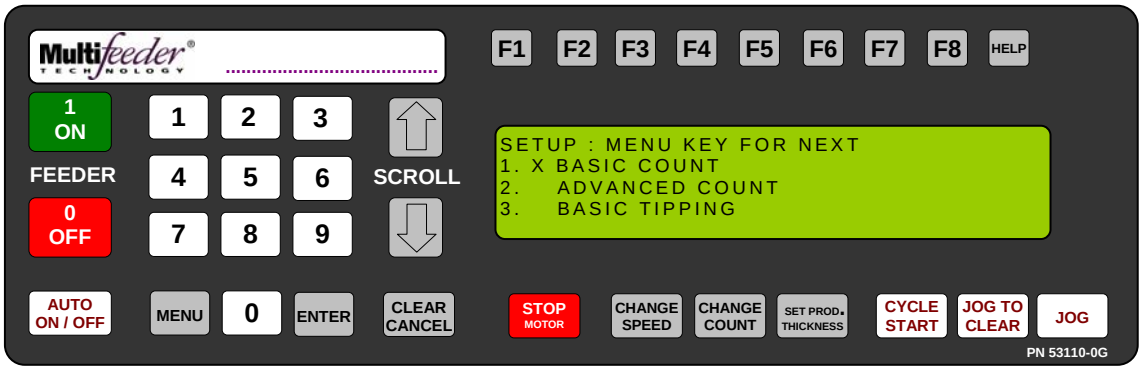


Program Menu Screen
Save Across All Programs

The screen is the *Save Across All Programs Screen*. Use this screen to copy current setting to all programs.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 2 3

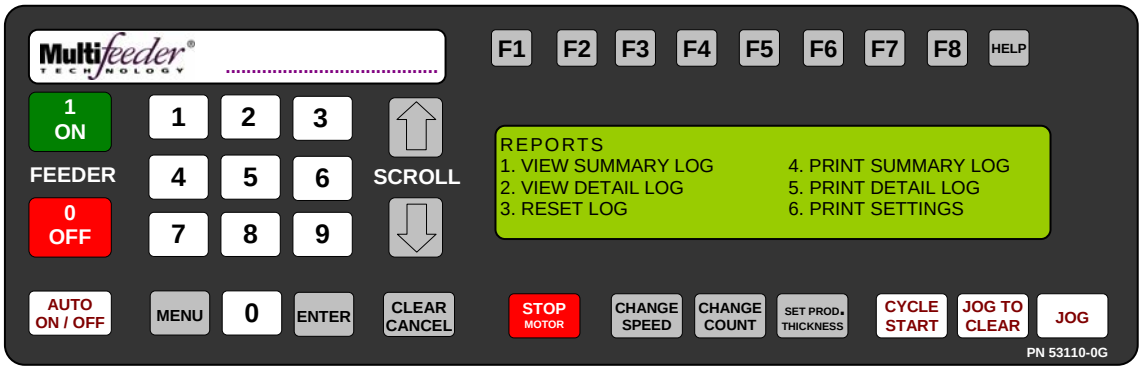


Setup Screen

The *Setup Screen* indicates the current running mode and all the available modes. This screen will differ depending on the optional modes selected in the *Set Machine Modes* menu. The “X” indicates the current running mode.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 3



Reports Screen

The *Reports Screen* can be used to view and print log files and settings.

1. VIEW SUMMARY LOG
2. VIEW DETAIL LOG
3. RESET LOG
4. PRINT SUMMARY LOG
5. PRINT DETAIL LOG
6. PRINT SETTINGS

The *Reports Screen* is divided into 6 subheadings that allow the user to access different areas of the Feeder's log. In this menu, errors are identified and time stamped, and total production count is kept. The information found in the *Reports Screen* may either be viewed on the LCD display or downloaded to a printer.

1. The View Summary Log screen allows the user to view a summary of the production run information, start and stop dates and times, the number of faults that occurred during periods of operation, and a pack per minute (PPM) product count.

2. The detail log provides a detailed summary account of *Feeder* activity. The information given includes a summary of the production run, start and stop dates and times, the time and type of faults that occurred during production runs, and the time and types of warnings that occurred during production runs.

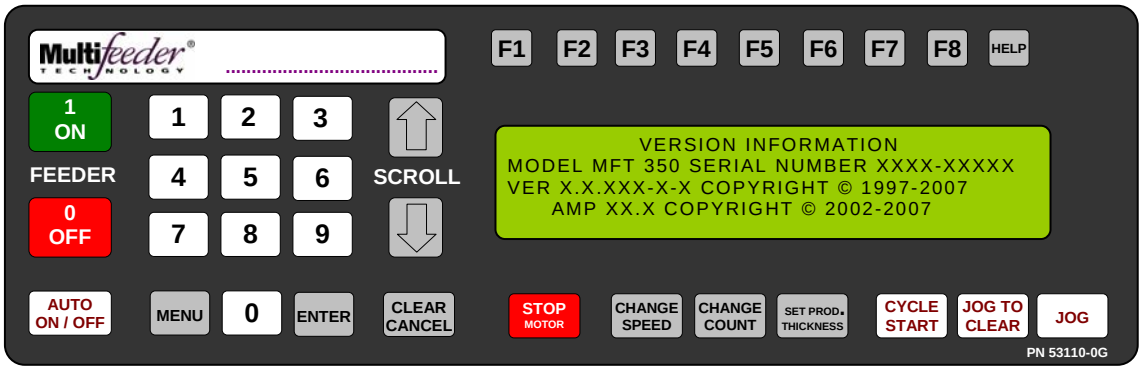
3. The Reset Log option. **NOTE! When this option is selected, all entries currently stored in the production log will immediately be emptied.** When this occurs, a screen declaring Figure 0-3 is shown before the program returns to the previous menu

4. To print a Summary Log, Detail Log or Setting Log, first attach a computer or laptop (running Microsoft Windows 95 or later with Microsoft Internet Explorer installed) to the *Feeder* via a NULL modem cable. On the computer side open up HyperTerminal: Start->Programs->Accessories->Communication->HyperTerminal

Connect using COM1 at 19200 bps, 8 data bits, parity none, 1 stop bit, flow control hardware. Next go to the menu Transfer->Capture Text… and call the file something like: summary, detail, or setting.htm.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 4

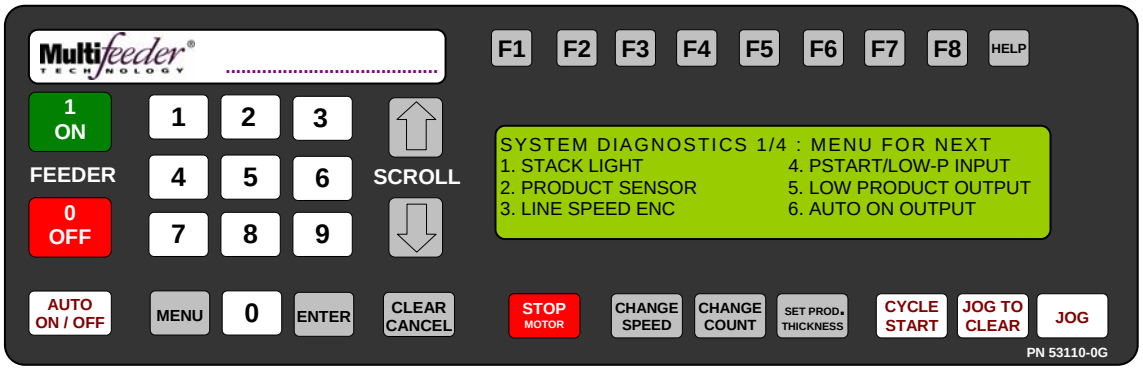


Identification Screen

The *Identification Screen* provides information about the Feeder model number, serial number and program versions.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 5

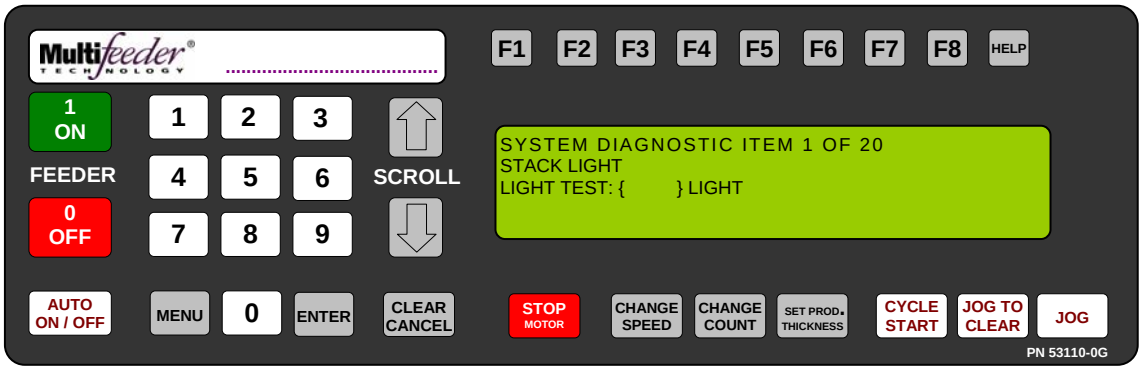


Diagnostic Screen 1 of 4

The diagnostics function reviews the electronics of the Feeder when diagnosing potential hardware issues and/or potential machine interfacing problems. There are a total of 20 different diagnostics menus. Each menu allows the operator the choice to run the diagnostic. To run the diagnostic use the keypad to choose the specific diagnostic to be run and press the ENTER key to start the test. To advance to a different diagnostic, press the CLEAR/CANCEL key to return to the *Diagnostic Menu Screen*. To exit the System Diagnostics, press the CLEAR/CANCEL key.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6



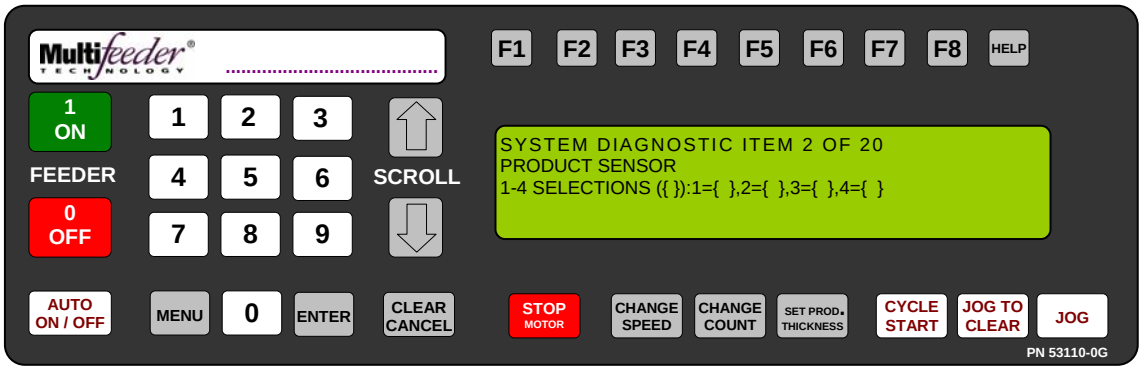
Diagnostic Screen 1 of 4

Light Test

The *Light Test* diagnostic tests the red, yellow, and green lights on the stack light. Enabling this test will toggle each light in secession. Press ENTER to start the test and press CLEAR/CANCEL to end the test.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password..

MENU 6 1

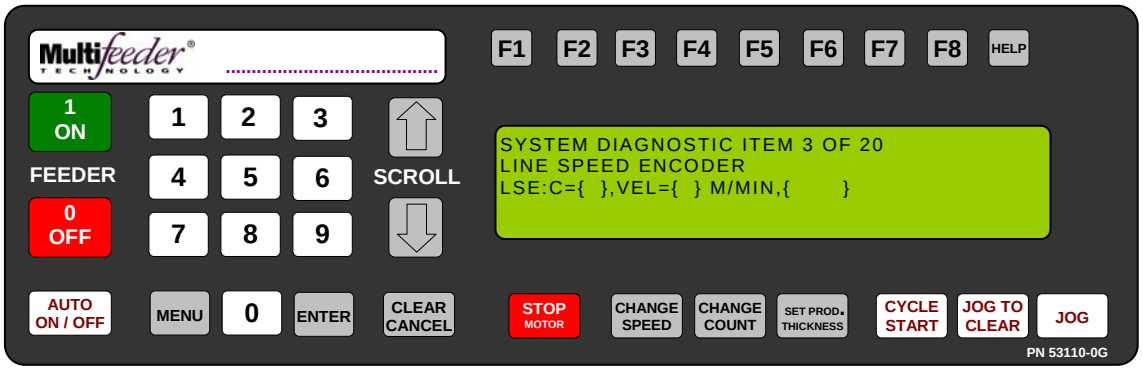


Diagnostic Screen 1 of 4
Product Sensor Test

This diagnostic tests the Feeder's product sensor across all four of its drives. If the operator presses keys ONE through FOUR they will select a single product sensor drive to retrieve data. Pressing the ZERO key returns to testing all four drives simultaneously. Press CLEAR/CANCEL to end the test.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 2

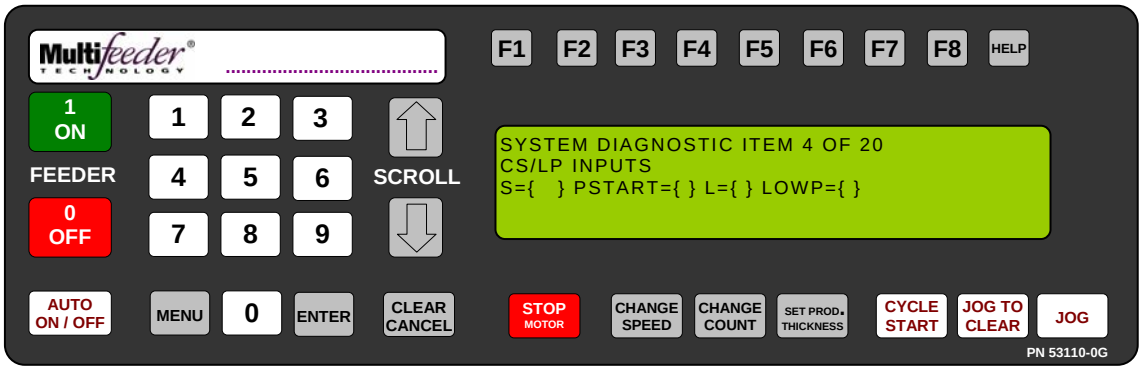


Diagnostic Screen 1 of 4
Line Speed Encoder Test

This diagnostic tests the Feeder's line speed encoder interface. "C" refers to the encoder count. If a line speed encoder is properly setup on a conveyor, the count should go up as the line goes forward. "VEL" refers to the computed inverse velocity of the conveyor. This value should go down as the speed of the conveyor increases. The line speed encoder must be operating while the diagnostic software is running.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 3

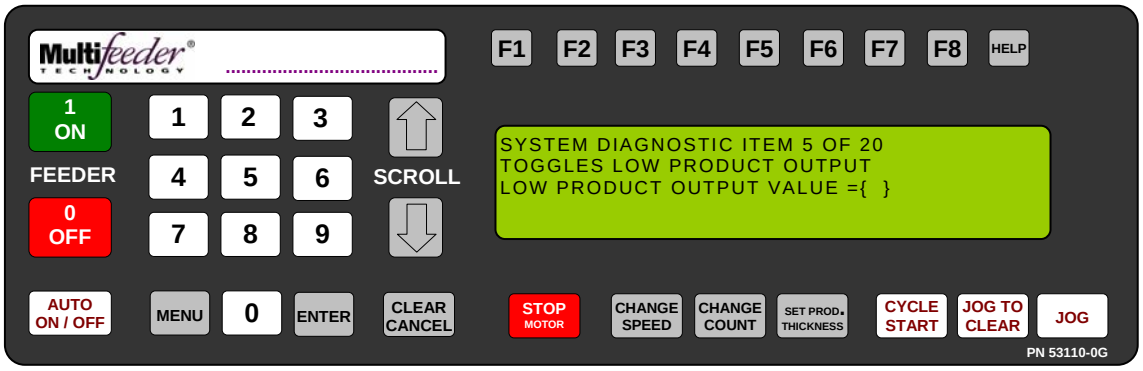


Diagnostic Screen 1 of 4
Cycle Start/Low Product Inputs Test

This diagnostic will test the Cycle Start Input and the Low Product input (also known as the discrete input). When a new signal goes into the Cycle Start Input a new timestamp will be displayed on the screen. Each input will display the current status of either 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 4

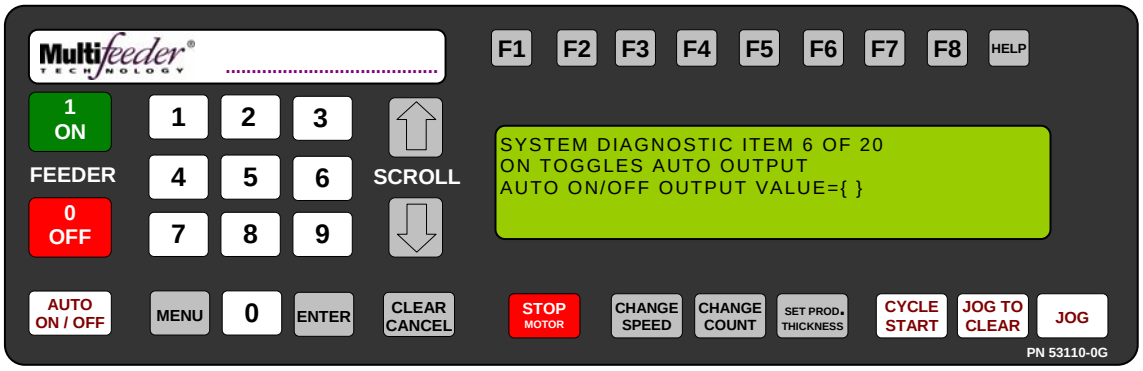


Diagnostic Screen 1 of 4
Low Product Output Test.

This diagnostic tests the Feeder's low product output. When the ON key is pressed the output will toggle between 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 5

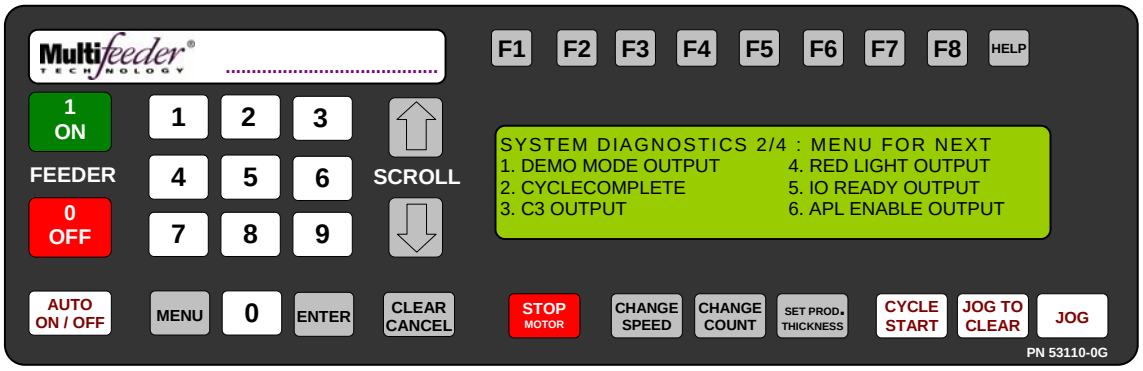


Diagnostic Screen 1 of 4
Auto ON/OFF Output Test

This diagnostic tests the Feeder's AUTO ON/OFF output. When the ON key is pressed the output will toggle between 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

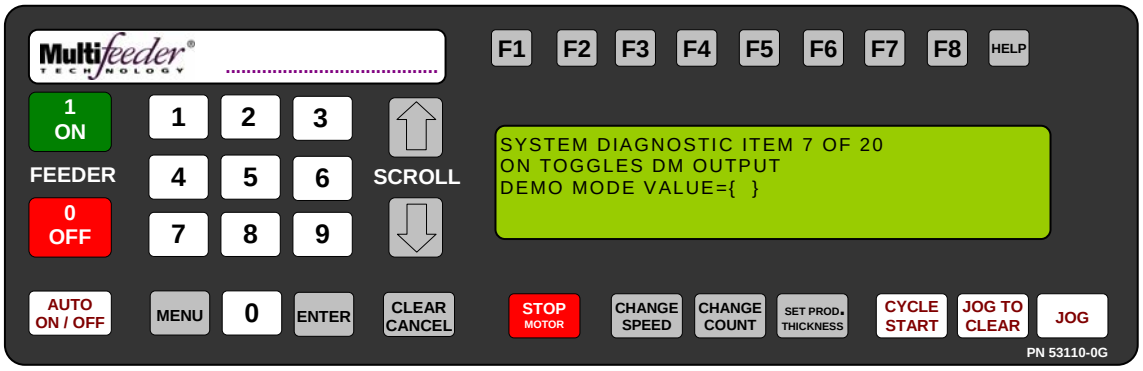
MENU 6 6



Diagnostic Screen 2 of 4

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU

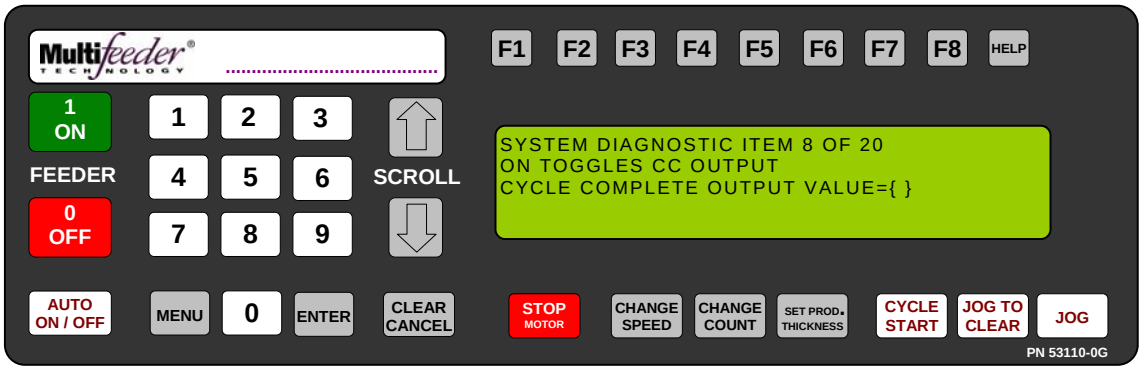


Diagnostic Screen 2 of 4
On Toggles DM Output Test

This diagnostic tests the Feeder's demo mode output. When the ON key is pressed the output will toggle between 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU 1

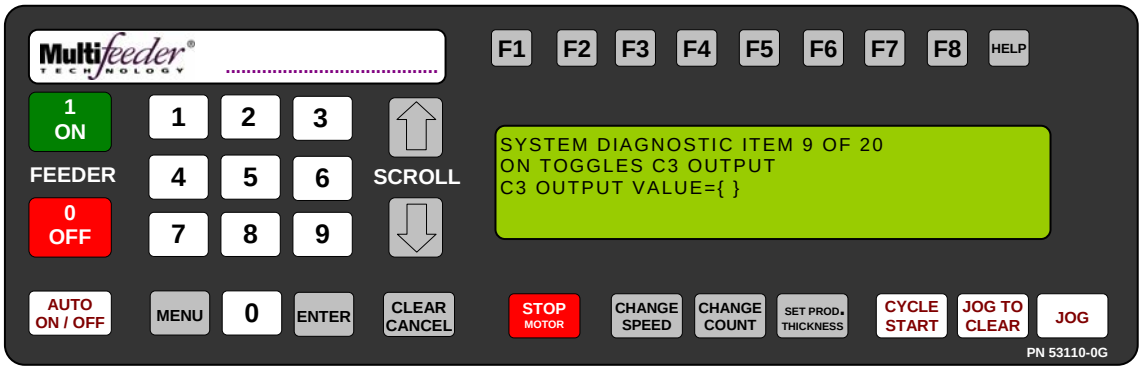


Diagnostic Screen 2 of 4
Cycle Complete Output Test

This diagnostic tests the Feeder's cycle complete output. When the ON key is pressed the output will toggle between 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU 2

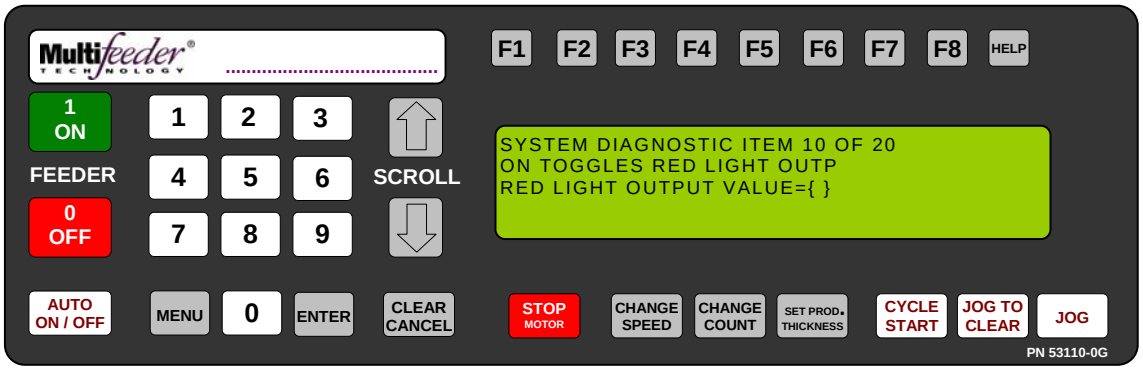


Diagnostic Screen 2 of 4
C3 Output Test

This diagnostic tests the Feeder's C 3 output. When the ON key is pressed the output will toggle between 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU 3

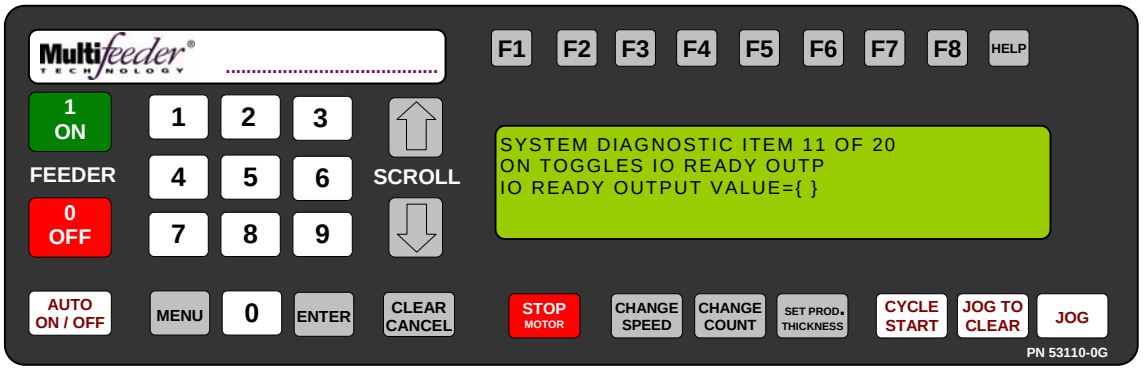


Diagnostic Screen 2 of 4
Red Light Output Test

This diagnostic tests the *Feeder* 's red light output. When the ON key is pressed the output will toggle between 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU 4

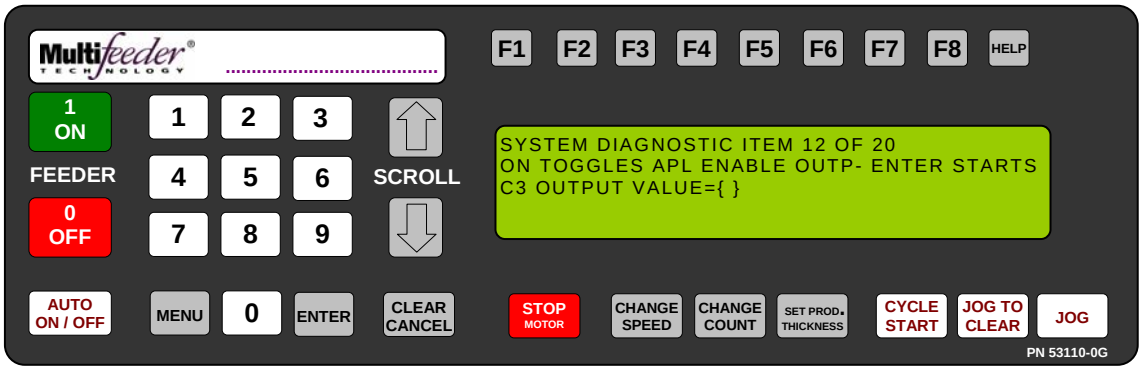


Diagnostic Screen 2 of 4
IO Ready Output Test

This diagnostic tests the *Feeder* 's IO ready output. When the ON key is pressed the output will toggle between 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU 5

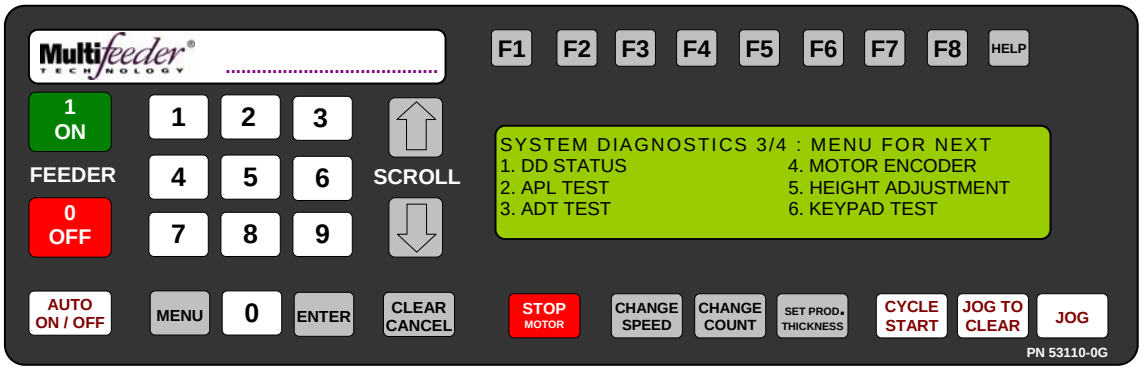


Diagnostic Screen 2 of 4
APL Enable Output Test

This diagnostic tests the *Feeder* 's cycle complete output. When the ON key is pressed the output will toggle between 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

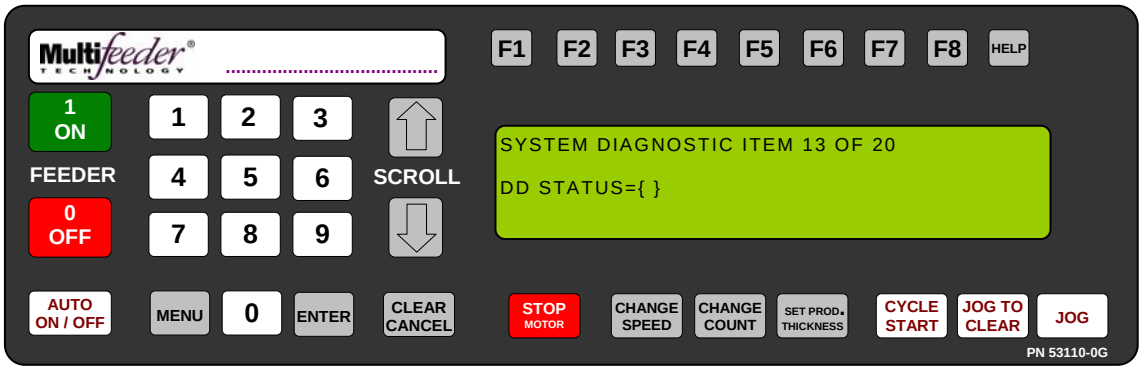
MENU 6 MENU 6



Diagnostic Screen 3 of 4

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU X 2

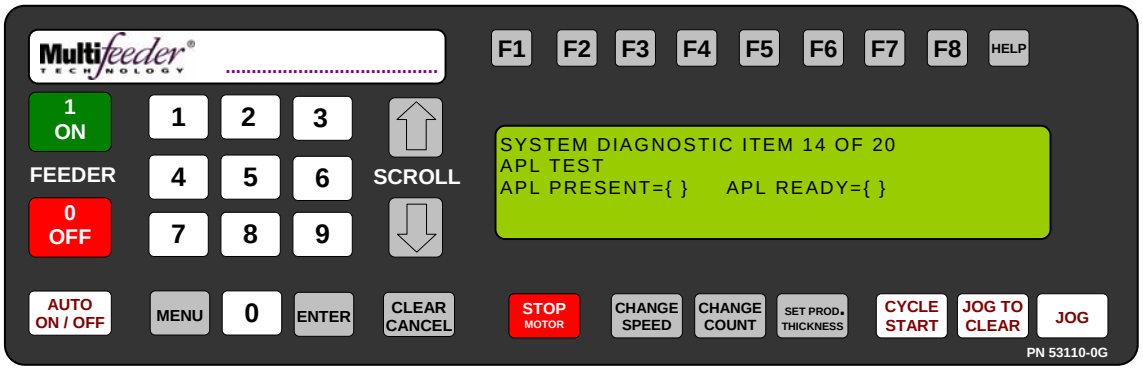


Diagnostic Screen 3 of 4
DD Status Test

This diagnostic tests the cycle start input and the Low Product input (also known as the discrete input). When a new signal goes into the cycle start input a new timestamp will be displayed on the screen. The discrete input will display the current status of either 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU X 2 1

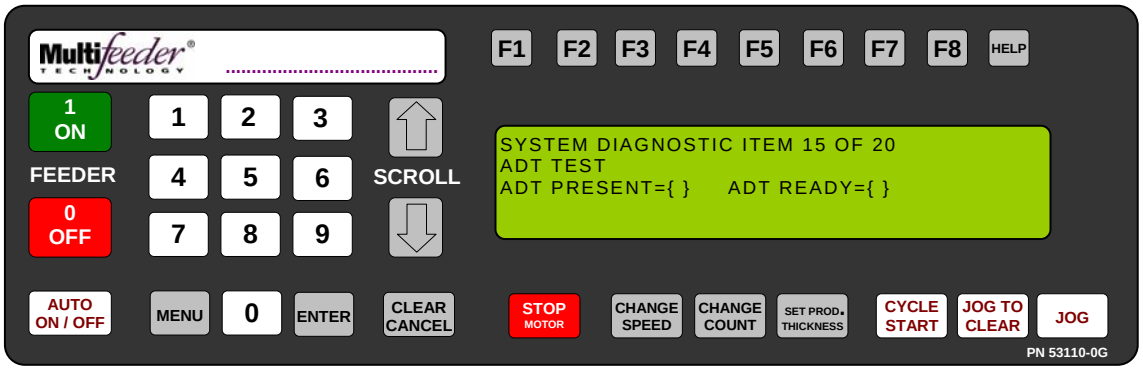


Diagnostic Screen 3 of 4
APL Status Test

This diagnostic tests the Automatic Product Loader (APL) interface. The output will be 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU X 2 2

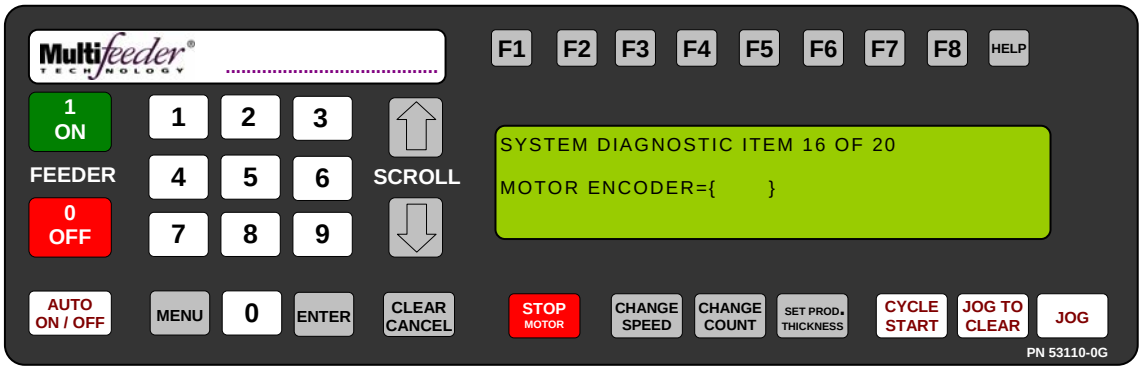


Diagnostic Screen 3 of 4
ADT Status Test

This diagnostic tests the Automatic Drop Table (ADT) interface. The output will be 1 (ON) or 0 (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU X 2 3

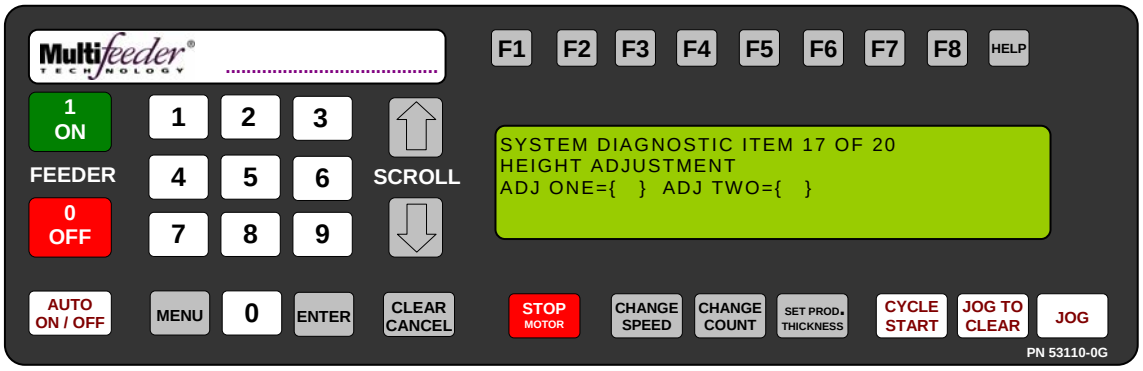


Diagnostic Screen 3 of 4
Motor Encoder Test

This diagnostic tests the system's ability to read the motor encoder. The output should increasing and consistent.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU X 2 4

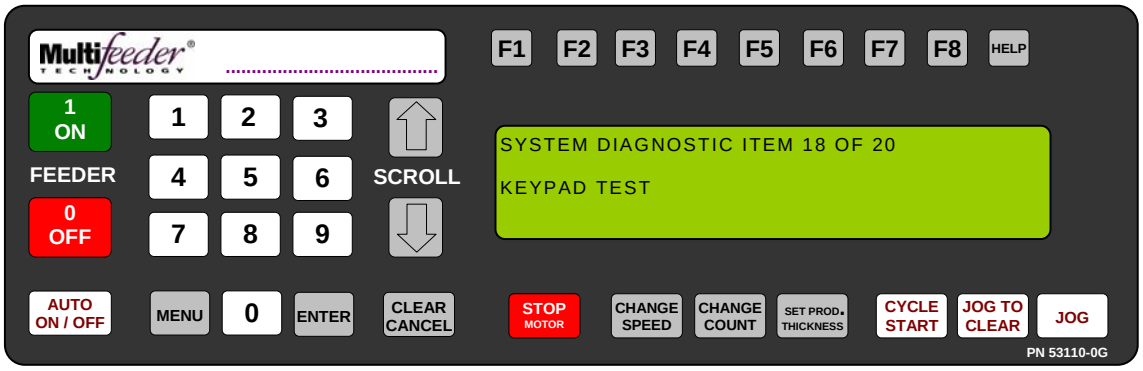


Diagnostic Screen 3 of 4
Height Adjustment

This diagnostic tests the values from the height adjustments. If you move the height adjustments up and down the numbers on this screen should increase and decrease accordingly.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU X 2 5

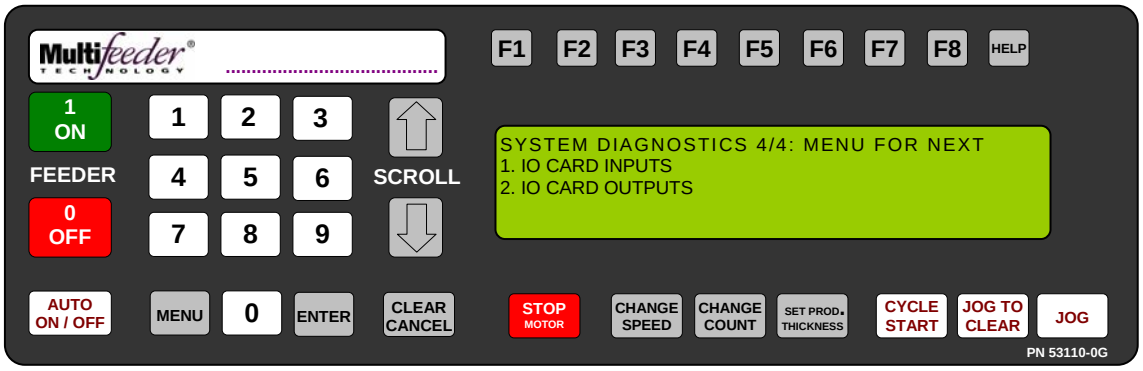


Diagnostic Screen 3 of 4
Keypad Test

This diagnostic tests the HCRM's membrane keypad. Pressing the key will display name of the key on the display for three seconds. The CLEAR/CANCEL key should be the last key tested on this screen. After the CLEAR/CANCEL key has been pressed, Diagnostics will be exited.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

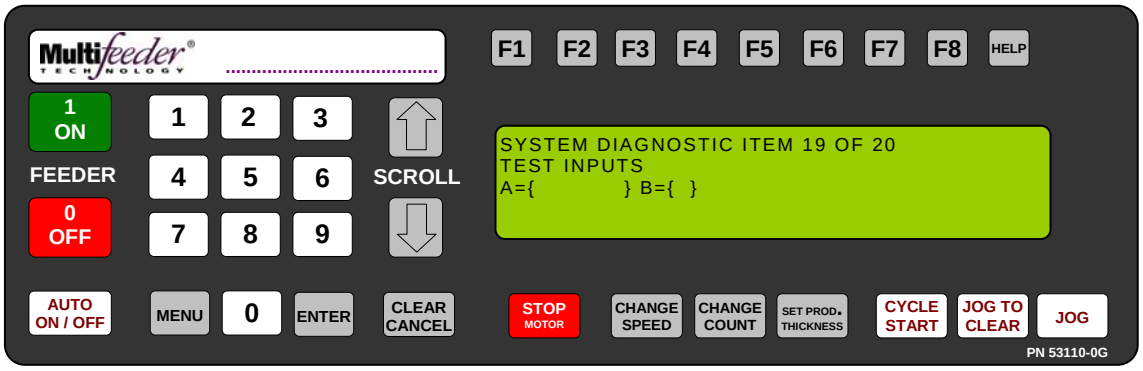
MENU 6 MENU X 2 6



Diagnostic Screen 4 of 4

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU X 3

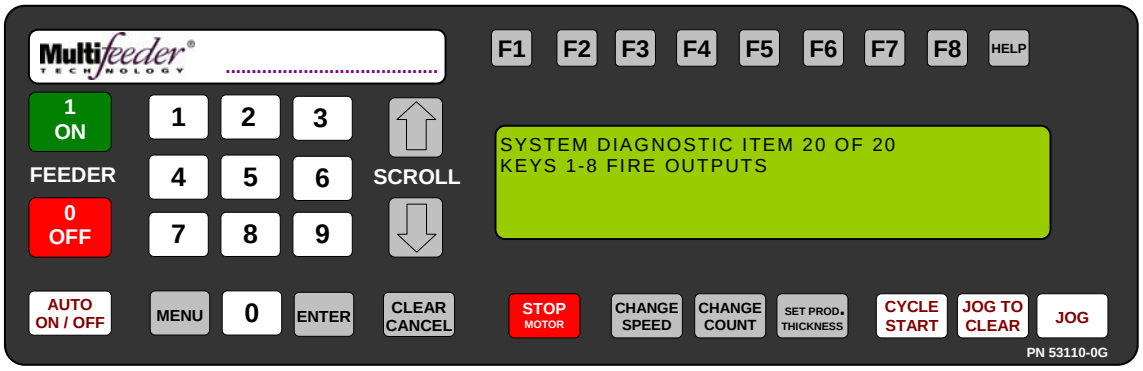


Diagnostic Screen 4 of 4
IO Card Inputs Test

This diagnostic will test the inputs on the optional I/O Card if installed on the Feeder. It will be displayed similarly to this: A= 10001001, where 1=(ON) and 0= (OFF).

Press the button sequence below from the *Ready Screen* to access this screen.

MENU 6 MENU X 3 1

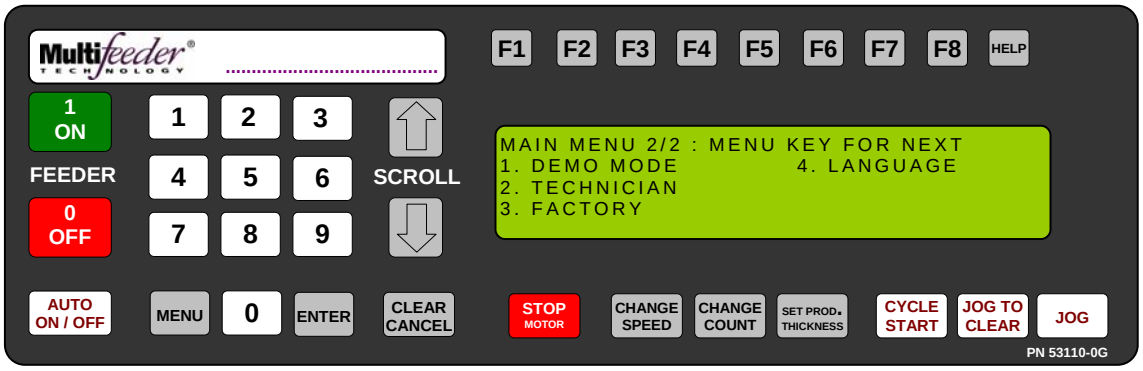


Diagnostic Screen 4 of 4
IO Card Outputs Test

This diagnostic will test the outputs on the optional I/O Card if installed on the Feeder. Pressing the corresponding number key on the keypad will toggle that output.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU 6 MENU X 3 2



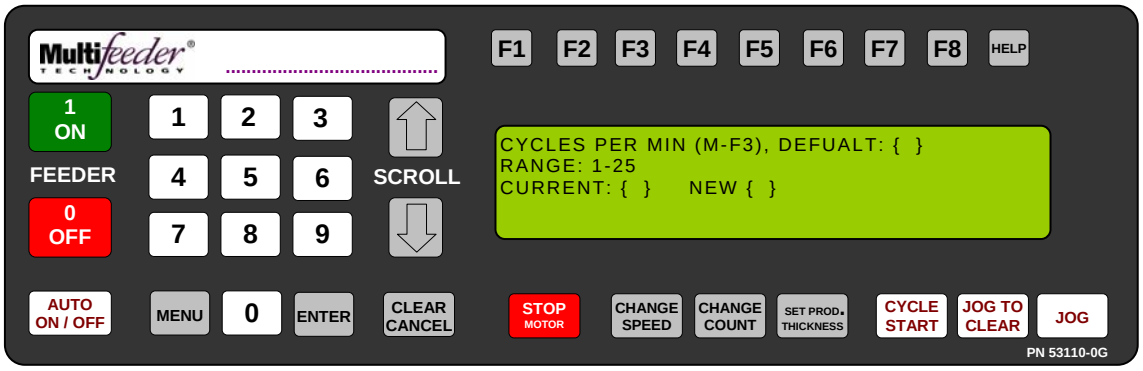
Main Menu Screen 2 of 2

The screen is a continuation of the *Main Menu Screen*. Use the number keys on the keypad to advance to corresponding setting.

1. DEMO MODE
2. TECHNICIAN
3. FACTORY
4. LANGUAGE

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2

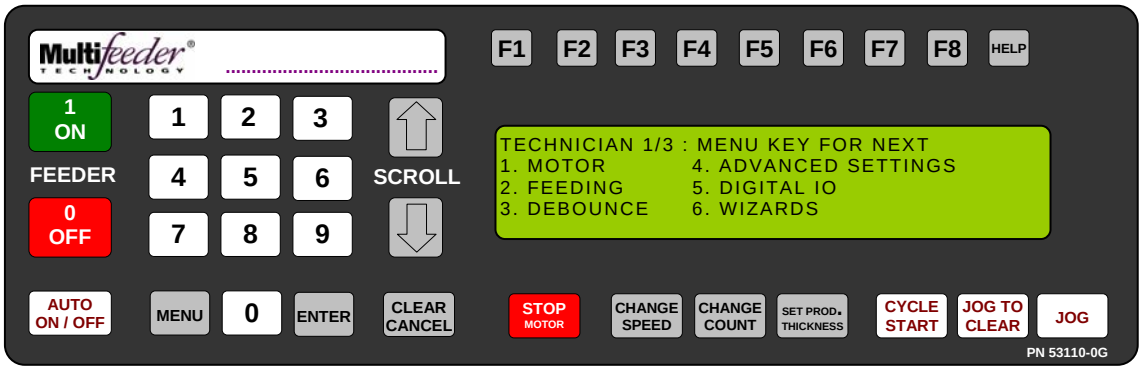


Main Menu Screen 2 of 2
Demo Mode

The Demo Mode tests Feeder settings while the machine is off-line of a larger system. This mode is especially useful for testing the Feeder settings of a new product before production is started. The Demo Mode screen prompts you to enter the number of cycles per minute to be fed. The product count will be the same as that previously set with the CHANGE COUNT hot key.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

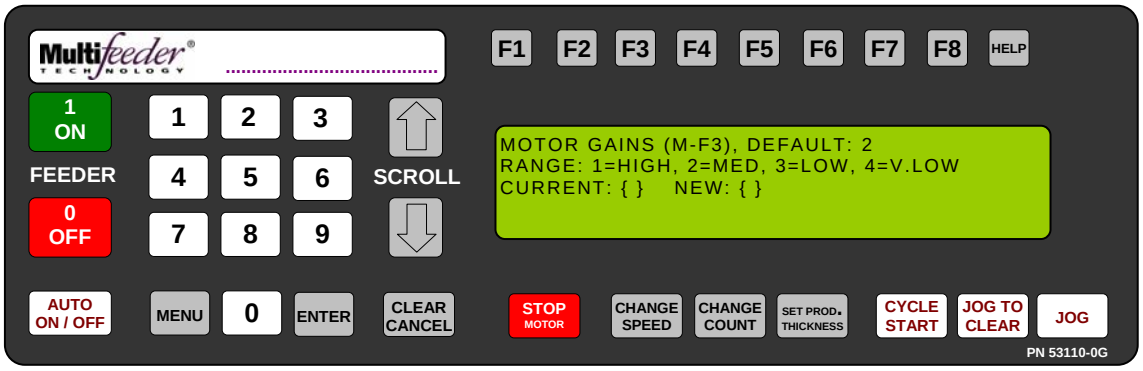
MENU X 2 1



Technician Settings Screen 1 of 3

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2



Technician Settings Screen 1 of 3 – Motor Settings
Motor Gains Setting

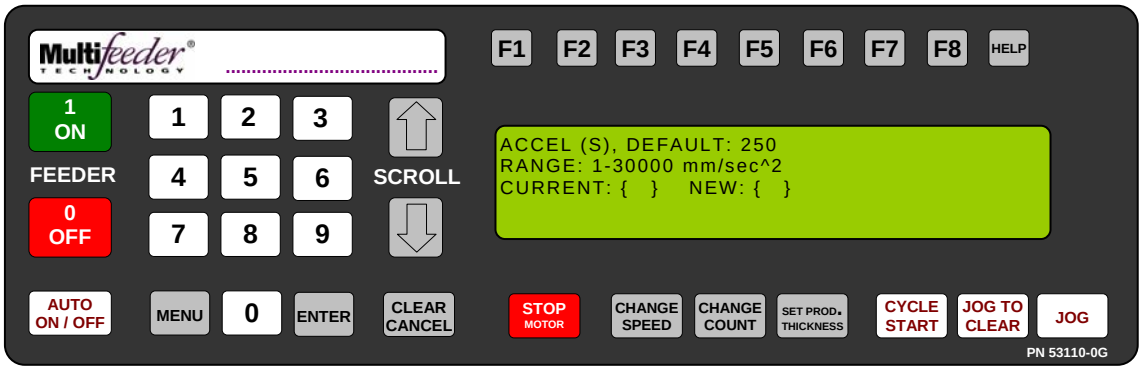
The motor gains' setting determines the amount of power and error correction used by the motion controller to run the *Feeder* . There are 4 different load settings available:

1. High
2. Medium
3. Low
4. Very Low

The customer will use a setting of HIGH for tight product placement or negligible load on the *Feeder* . A setting of MEDIUM is the most common and should work for most cases. A setting of VERY LOW represents a heavy stack of products or a large load on the *Feeder* .

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 1

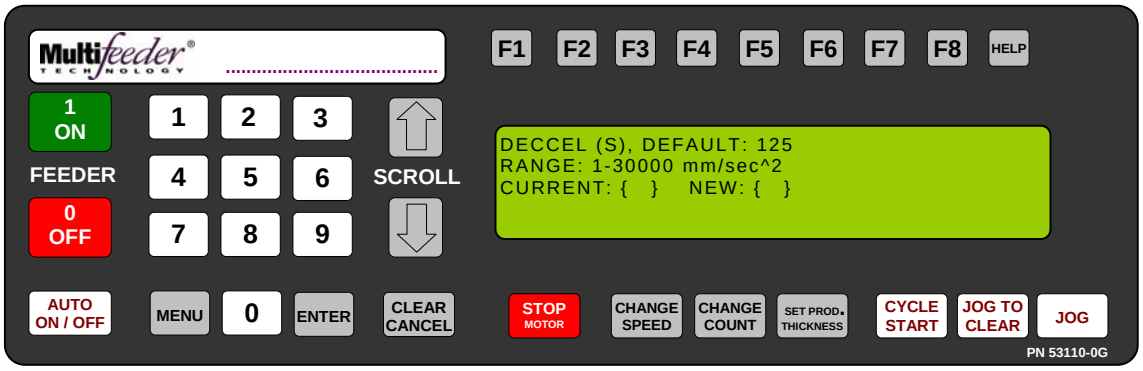


Technician Settings Screen 1 of 3 – Motor Settings
Motor Acceleration Setting

The *Feeder* acceleration determines how quickly the *Feeder* accelerates to the SPEED setting from rest. The default acceleration range depends upon whether the *Feeder* is equipped with the high performance package. If the high performance package is not equipped then the effective range of acceleration values is between 1000 and 20000. If the high performance package is equipped then the effective range is between 1000 and 30000.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 1 MENU

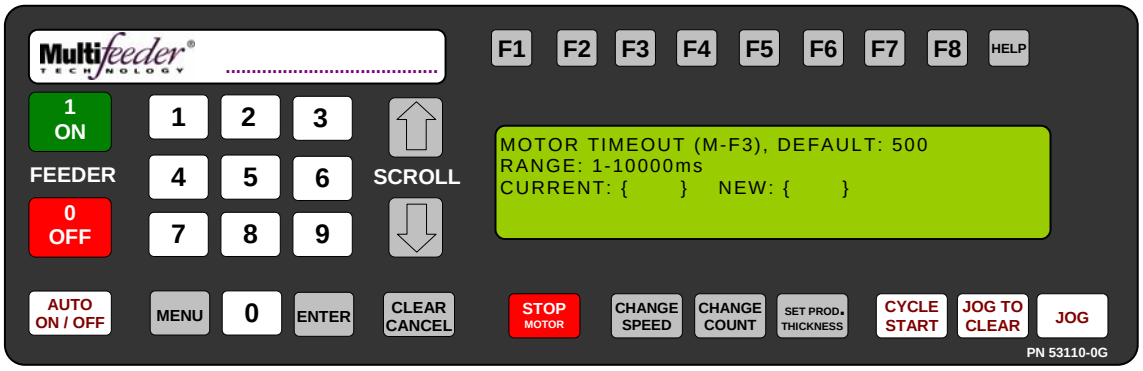


Technician Settings Screen 1 of 3 – Motor Settings
Motor Deccel Setting

The *Feeder* deceleration is used to determine how quickly the *Feeder* decelerates from the SPEED setting to rest. The default acceleration range depends upon whether the *Feeder* is equipped with the high performance package. If the high performance package is not equipped then the effective range of acceleration values is between 1 and 20000. If the high performance package is equipped then the effective range is between 1 and 30000.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 1 | MENU X 2

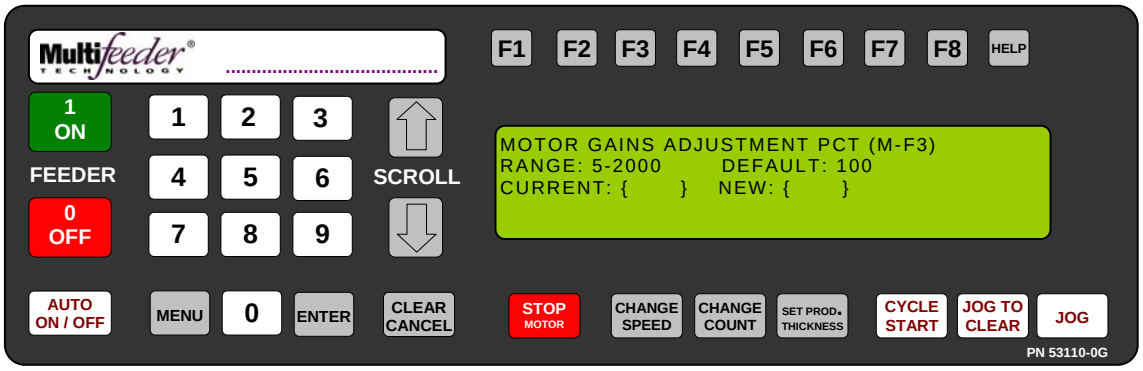


Technician Settings Screen 1 of 3 – Motor Settings
Motor Timeout Setting

The motor timeout setting determines how long the *Feeder* will wait for the motor to move before timing out and declaring a MAJOR PRODUCT JAM. This prevents the motor and amplifier from being damaged when the *Feeder* is overloaded or jammed. If the *Feeder* isn't jammed but MAJOR PRODUCT JAM is declared several times, then raising the timeout value may be beneficial. The default timeout is 500 ms which is adequate for most purposes.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 1 | MENU X 3

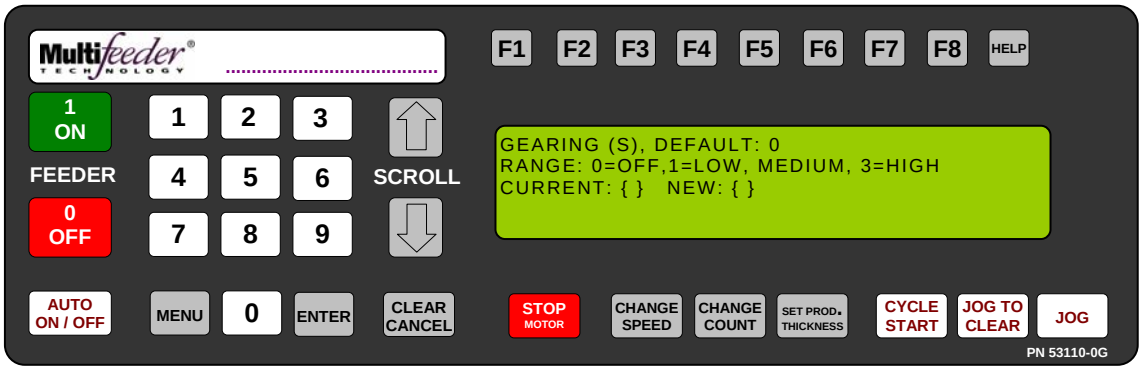


Technician Settings Screen 1 of 3 – Motor Settings
Motor Gains Setting

This setting scales motor gains used in the system up or down. The default is 100% which is adequate for most purposes. However when using AccuTipping this value should be sett to 300%.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

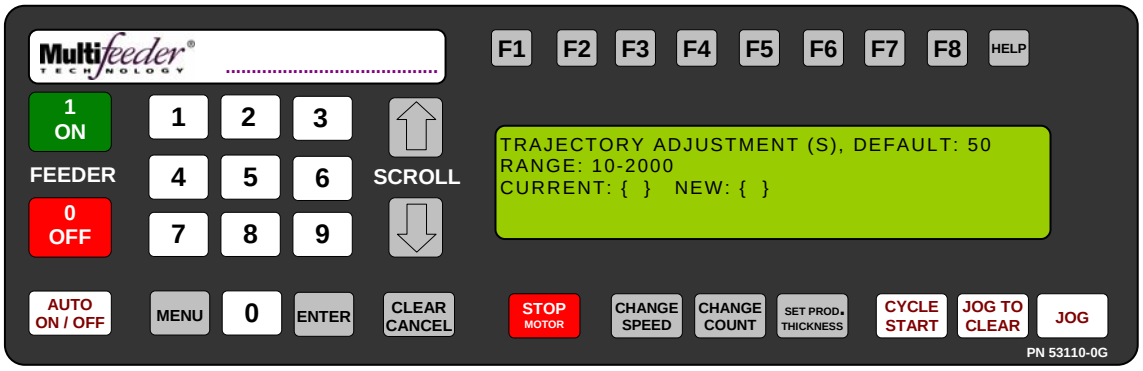
MENU X 2 2 1 MENU X 4



Technician Settings Screen 1 of 3 – Motor Settings
Gearing Setting

Press the button sequence below from the *Ready Screen* to access this screen.

MENU X 2 | 2 | 1 | MENU X 5

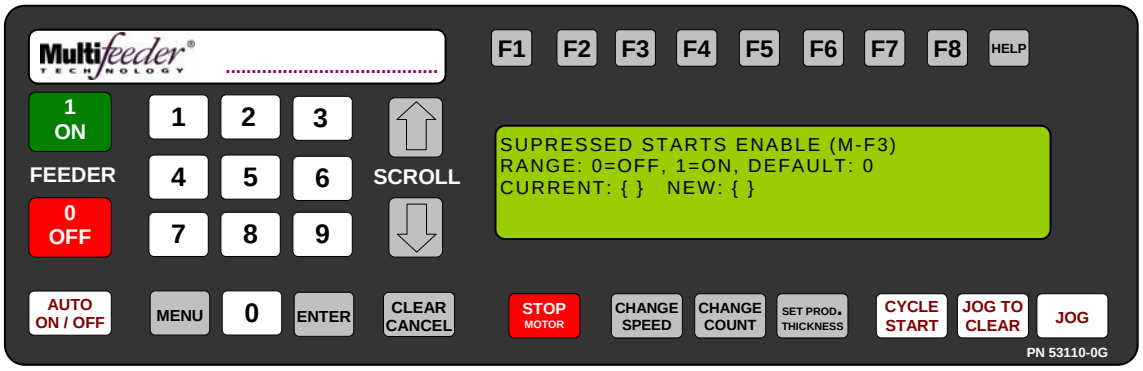


Technician Settings Screen 1 of 3 – Motor Settings
Trajectory Setting

The trajectory adjustment setting affects the manner in which the HCRM calculates stop position. Increasing the value causes the HCRM to calculate the stop position more conservatively, which may result in slower run time and shorter stop position. Conversely, decreasing the value causes the HCRM to calculate the stop position less conservatively, and may result in faster run time and a longer stop position. The default setting is 50, and should not be changed under normal operating conditions.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 1 | MENU X 6

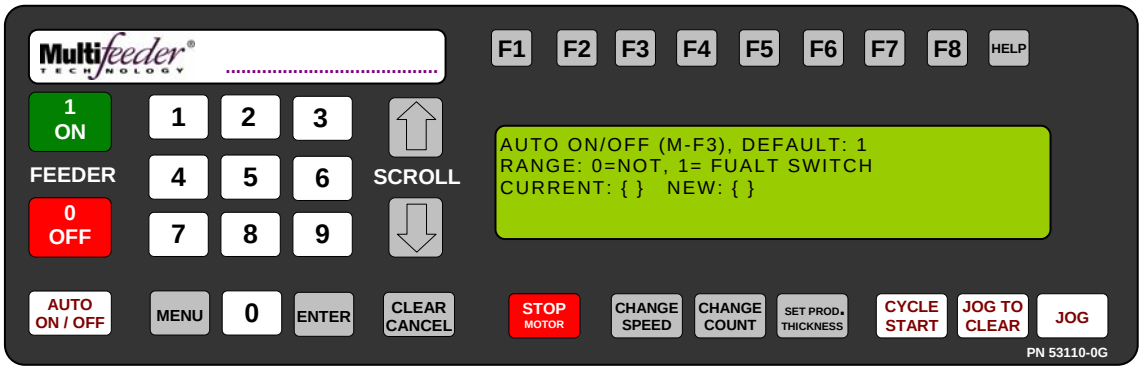


Technician Settings Screen 1 of 3 – Feeding Settings
Suppressed Starts Setting

When the suppress starts setting is activated the *Feeder* will not feed as long as the selected input signal is active. This pertains to feeding occurring through the start sensor as well as feeding occurring in Demo Mode.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 2



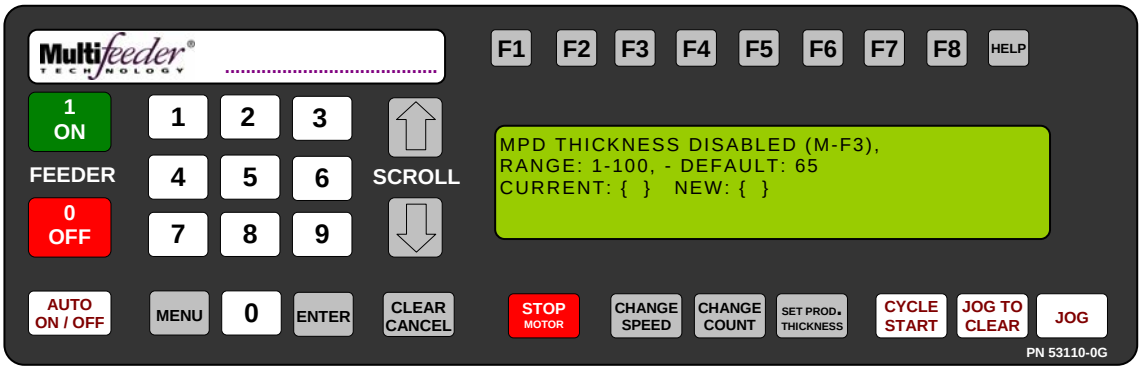
Technician Settings Screen 1 of 3 – Feeding Settings
Auto On/Off Setting

The Auto On/Off option controls whether or not the *Feeder* automatically switches to Auto Off when a fault occurs. The ability to control this function is particularly useful when several machines are integrated into a large system. The setting is determined by system requirements and system integration. The Auto On/Off screen shows the current Auto On/Off setting and gives the user the option of switching the setting.

When 1 (Fault Switch) is selected the *Feeder* will automatically switch to Auto Off when a fault is detected. You must then manually press the AUTO ON hot key before the *Feeder* will acknowledge a start signal from the host machine. When 0 (NO) is selected the *Feeder* will remain in the Auto On condition when a *Feeder* fault occurs. The *Feeder* comes standard with a default setting of 1.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 2 MENU

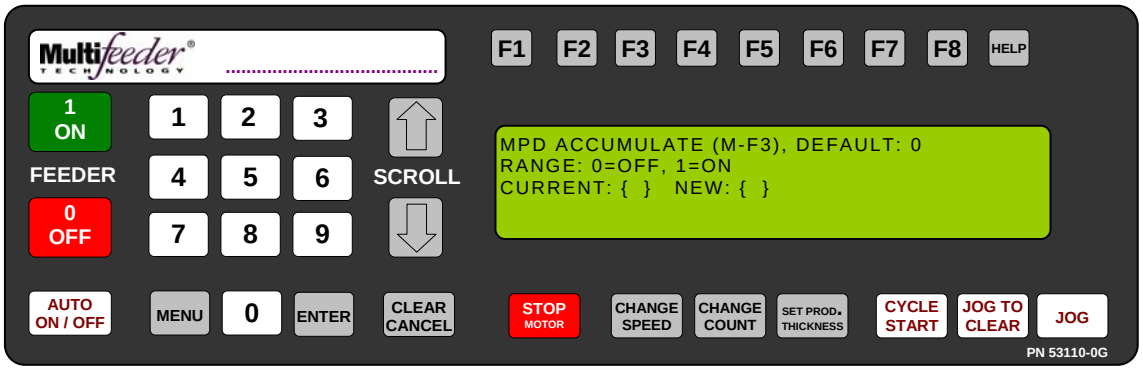


Technician Settings Screen 1 of 3 – Feeding Settings
MPD Thickness Disabled Setting

The MPD thickness setting allows the operator to change the sensor level at which the *Feeder* determines that it is looking at multiple products instead of a single product. Raising the sensor level allows an increased number of sensor values to be flagged as multiple product values (thick values). Lowering the sensor level decreases the number of sensor values flagged (thereby reducing the multiple product values). The default value for this setting is 65.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 2 | MENU X 2

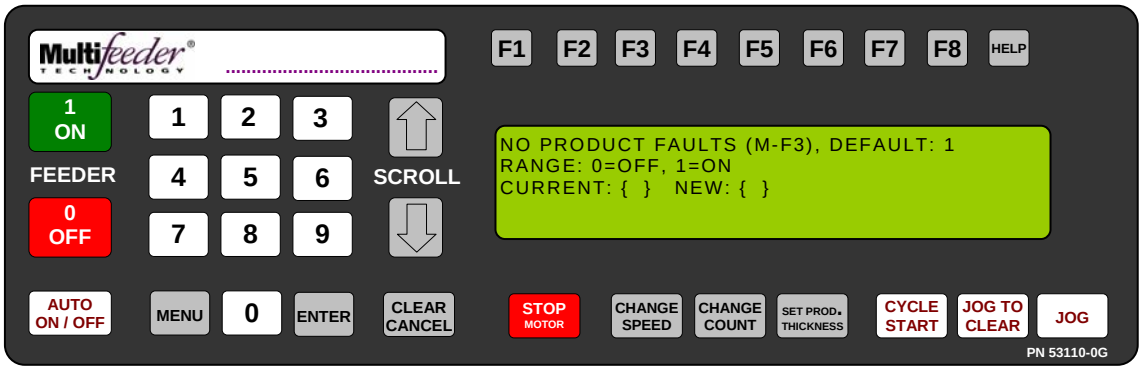


Technician Settings Screen 1 of 3 – Feeding Settings
MPD Accumulate Setting

The MPD accumulate setting allows the *Feeder* to collect information concerning multiple product status. The information is gathered across the entire product and added together. This allows the *Feeder* to determine whether a product is stacked or not. If the setting is turned OFF, the *Feeder* uses uninterrupted overlapped thick areas to determine if a multiple product instance occurs. MPD accumulate is especially useful when used on products with holes.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

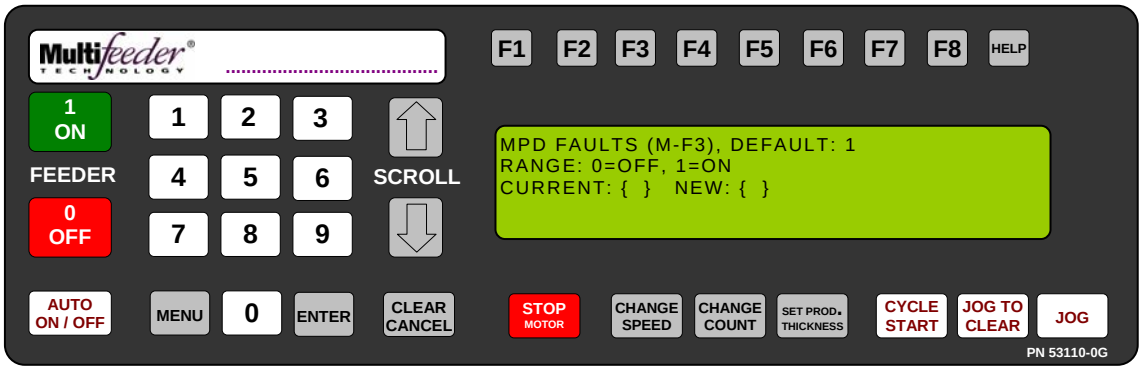
MENU X 2 2 2 MENU X 3



Technician Settings Screen 1 of 3 – Feeding Settings
No Product Faults Setting

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 2 MENU X 4

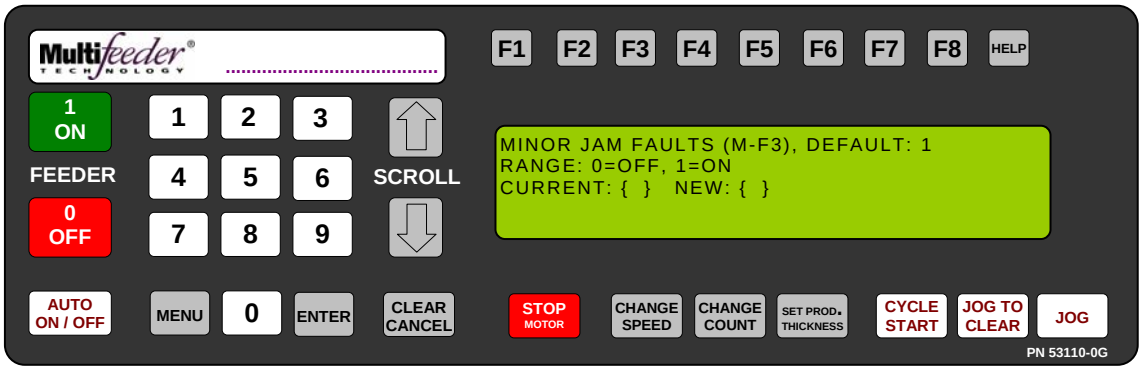


Technician Settings Screen 1 of 3 – Feeding Settings
MPD Faults Setting

This setting allows the *Feeder* to enable/disable MPD (Multiple Product Detection) faults. MPD faults are caused by the *Feeder* detecting overlapping product over a specified proportion of the product length.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 2 MENU X 5

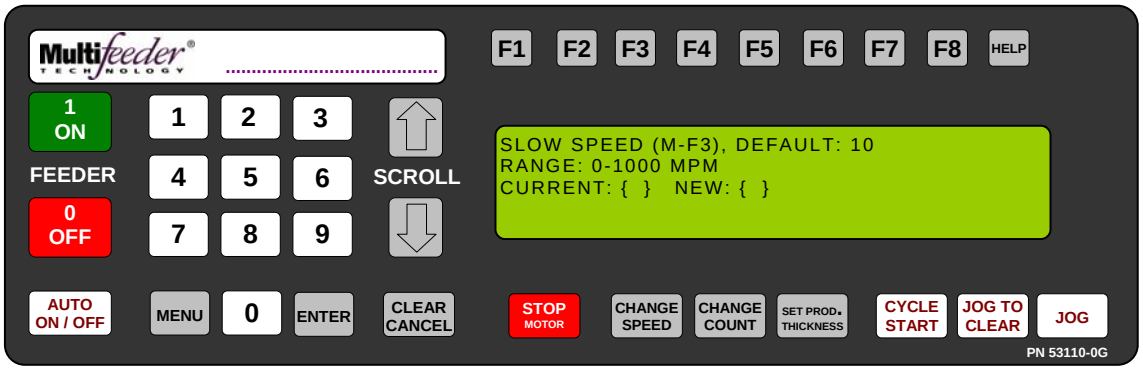


Technician Settings Screen 1 of 3 – Feeding Settings
Minor Jam Faults Setting

This setting allows the *Feeder* to enable/disable minor jam faults. Minor jam faults are caused by product that is slightly overlapping but is not overlapping far enough to cause an MPD fault.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 2 | MENU X 6

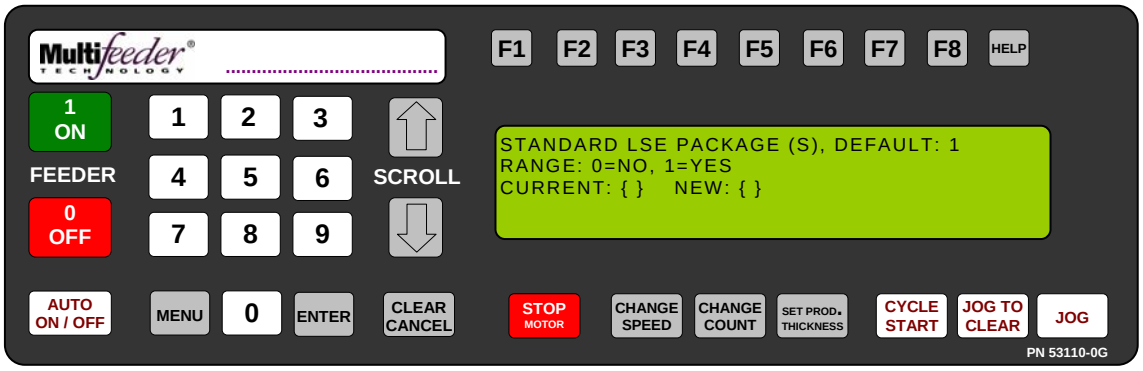


Technician Settings Screen 1 of 3 – Feeding Settings
Slow Speed Setting

The Slow Speed setting allows the *Feeder* to rotate between two *Feeder* speeds. In *Count Mode*, the feeder will use this value when feeding the last product in the count. When this value is set to zero (0), the feeder will determine the Slow Speed setting.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 2 MENU X 7



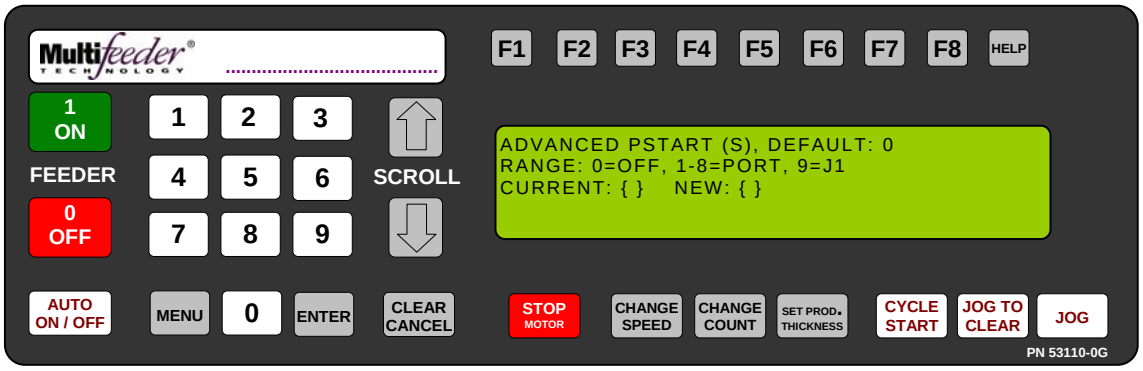
Technician Settings Screen 1 of 3 – Debounce Settings
Standard LSE Setting

When the Standard LSE Package is enabled the *Feeder* assumes that the standard encoder and encoder wheel are being used.

Note: You must verify proper encoder counts are entered at the Line Speed Encoder Delay Setting (p90)

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 3

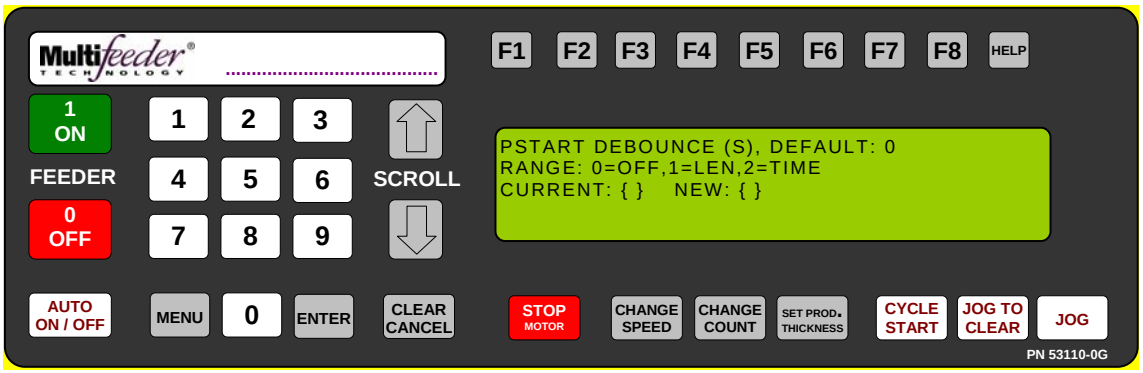


Technician Settings Screen 1 of 3 – Debounce Settings
Advanced PStart Setting

This screen allows you to select the port to use with an external start sensor. Ports one (1) though EIGHT (8) are available with the optional I/O Card, J-1 is a standard Pstart port on the Feeder. Enabling this setting will prompt the next two screens (PStart Debounce and PStart Debounce Value) providing advance control over the input signal.

Pres Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 3 MENU

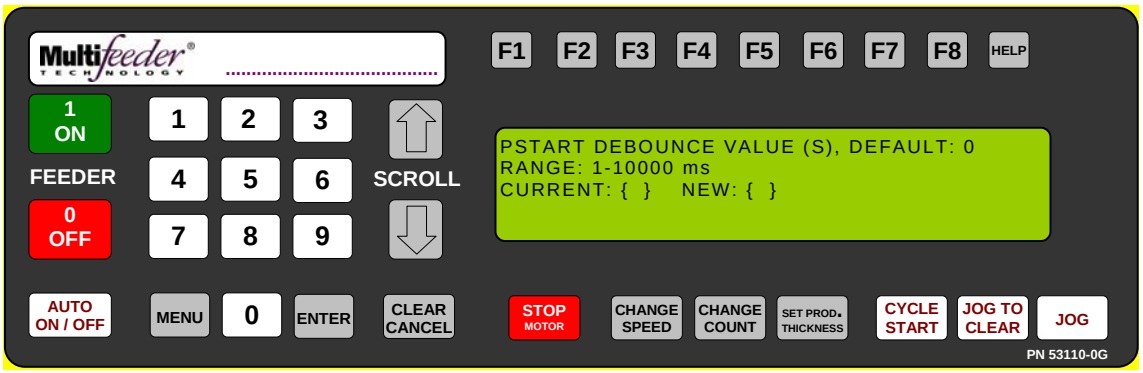


Technician Settings Screen 1 of 3 – Debounce Settings
PStart Debounce Setting

When this is enabled the *Feeder* will enable de-bouncing of the PSTART signal of the *Feeder* . This de-bounce can be either distance, if a line speed encoder is installed, or time. In addition the *Feeder* can also use a selected input from an I/O card (purchased separately) to use as the start signal to the *Feeder* .

Pres Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 3 | MENU X 2

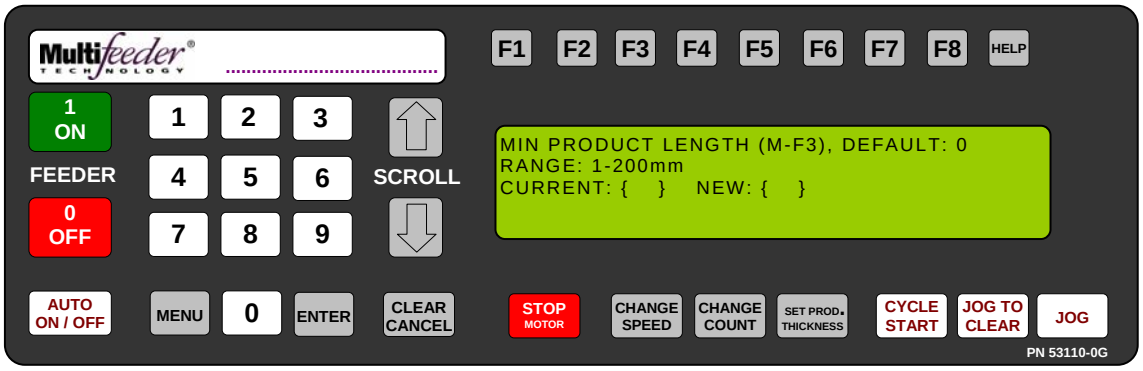


Technician Settings Screen 1 of 3 – Debounce Settings
PStart Debounce Setting

When this is enabled the Feeder will enable de-bouncing of the PSTART signal of the Feeder. This de-bounce can be either distance, if a line speed encoder is installed, or time. In addition the Feeder can also use a selected input from an I/O card (purchased separately) to use as the start signal to the Feeder.

Pres Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 3 | MENU X 2

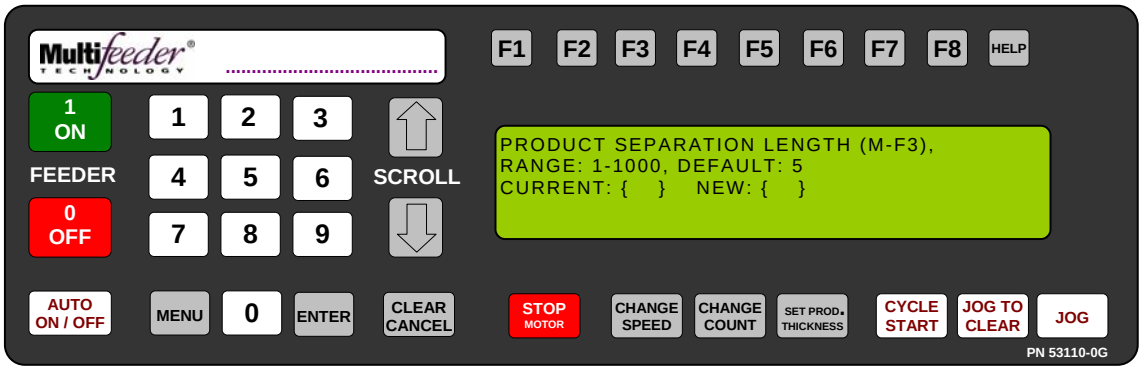


Technician Settings Screen 1 of 3 – Debounce Settings
Minimum Product Length Setting

The min product length setting is the minimum amount of product needed for the *Feeder* to determine that a new product is present. If the *Feeder* is in an exceptionally noisy environment it is sometimes helpful to set the minimum product length so that there is extra de-bounce available for finding the next product. Increasing this setting will also increase the stop position.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 3 | MENU X 2

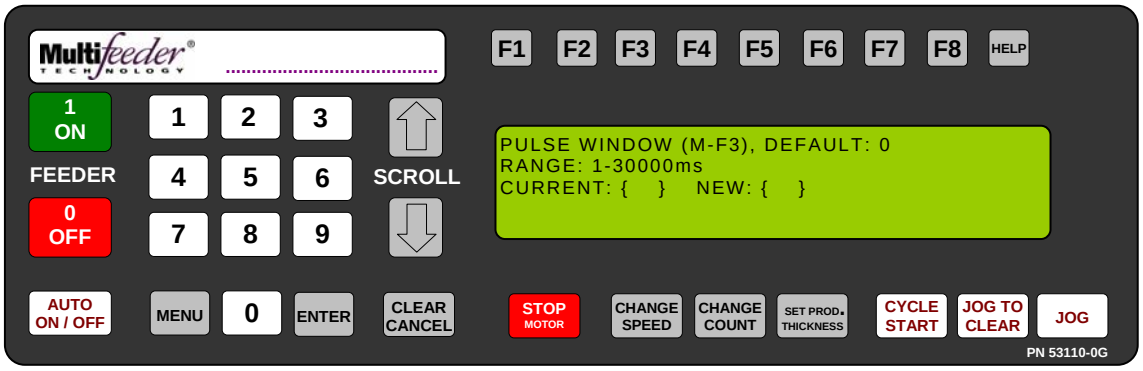


Technician Settings Screen 1 of 3 – Debounce Settings
Product Separation Length Setting

The new Product Separation Length is the minimum amount of space between products for *Feeder* to determine that there is a gap. If a product with holes is being fed, the Product Separation Length should be greater then the maximum hole size.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 3 MENU X 3



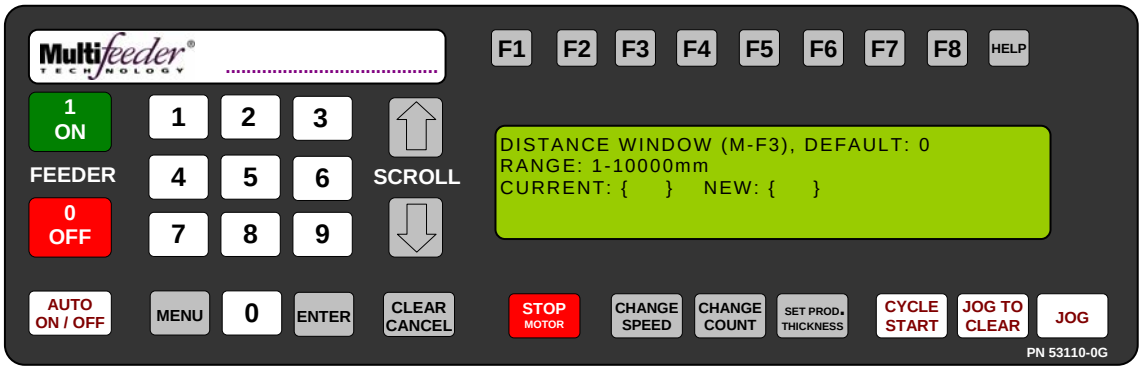
Technician Settings Screen 1 of 3 – Debounce Settings
Pulse Window Setting

The Pulse Window screen gives the user the option of ignoring start pulses occurring between 0 and 30000 milliseconds after the last good start pulse was accepted. This shields the *Feeder* from spurious pulses which may occur during feeding. If the Pulse Window is set to 0 each start pulse will be accepted. This function is not available when using AccuTipping. When using AccuTipping, de-bounce is added to the start pulse through the ADVANCED PSTART settings on p83.

To determine the Pulse Window, a quick calculation must be performed. First, determine the current running speed of the host line in cycles per millisecond. Take the inverse of this number (1/cycles per millisecond) to get our first variable, TIME1. Next, access Demo Mode (Menu 5) to determine the cycles per minute. Convert this value to cycles per millisecond (divide by 60000). Take the inverse of this number to get our second variable, TIME2. Your Pulse Window should be set to TIME1-TIME2. Please note that the time it takes the *Feeder* to dispense one product does not change for different line speeds, unless any parameters are changed or speed compensation is enabled. Then the Pulse Window strictly becomes a function of the line speed.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 3 MENU X 4

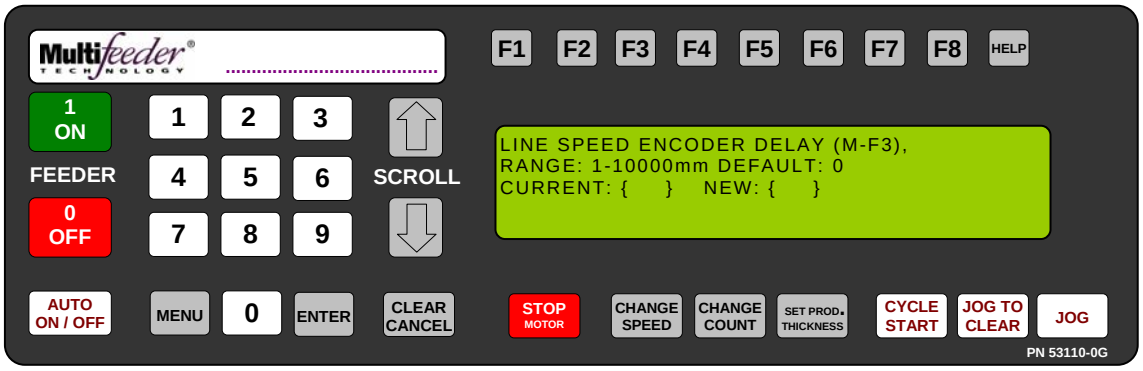


Technician Settings Screen 1 of 3 – Debounce Settings
Distance Window Setting

The Distance Window screen gives the user the option of ignoring start pulses which occur between 1 to 10000mm after the last good start pulse was accepted. This shields the *Feeder* from spurious pulses which may occur during feeding.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 3 MENU X 5

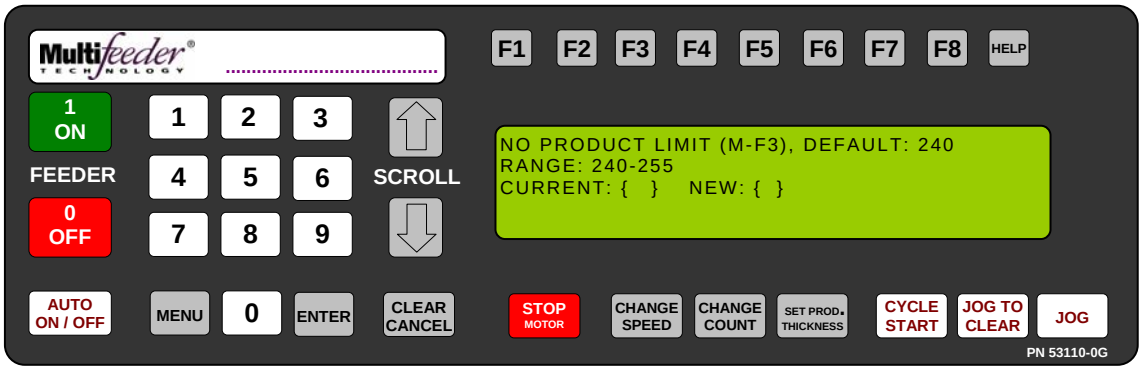


Technician Settings Screen 1 of 3 – Debounce Settings
Line Speed Encoder Delay Setting

This setting requires that a line speed encoder has been installed, and will delay feeding the product until the line speed encoder delay distance has passed.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 3 | MENU X 6

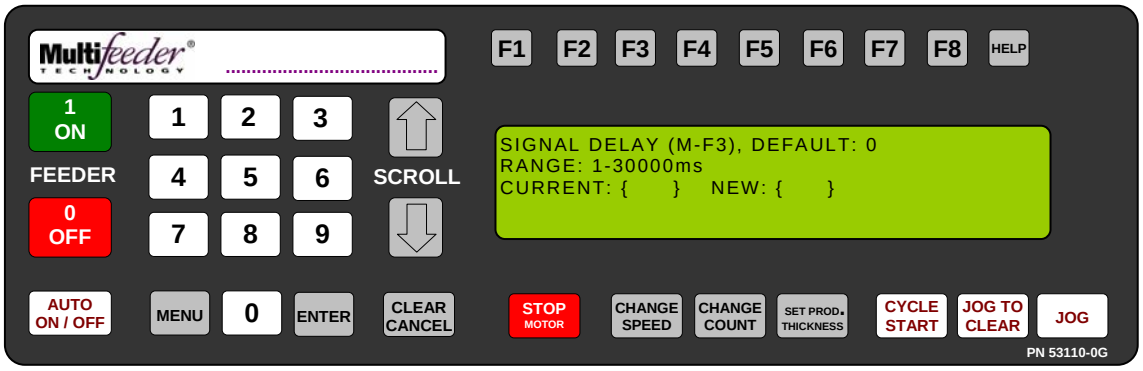


Technician Settings Screen 1 of 3 – Debounce Settings
No Product Limit Setting

When the product sensor value is greater then this setting the computer will determine that there is no product beneath the sensor.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 3 MENU X 7

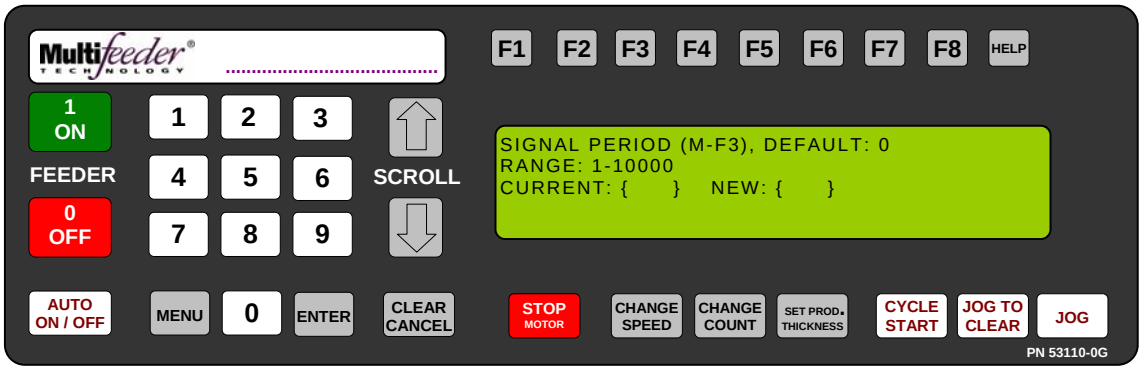


Technician Settings Screen 1 of 3 – Debounce Settings
Signal Delay Setting

The Signal Delay screen gives the user the option of delaying the acknowledgment of the start pulse at the start connector. This function is used primarily when the *Feeder* is integrated with another machine. The signal may be delayed from 1 to 30000 milliseconds (30 seconds). When the delay is set to 0 the start pulse will be acknowledged immediately.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 3 | MENU X 8

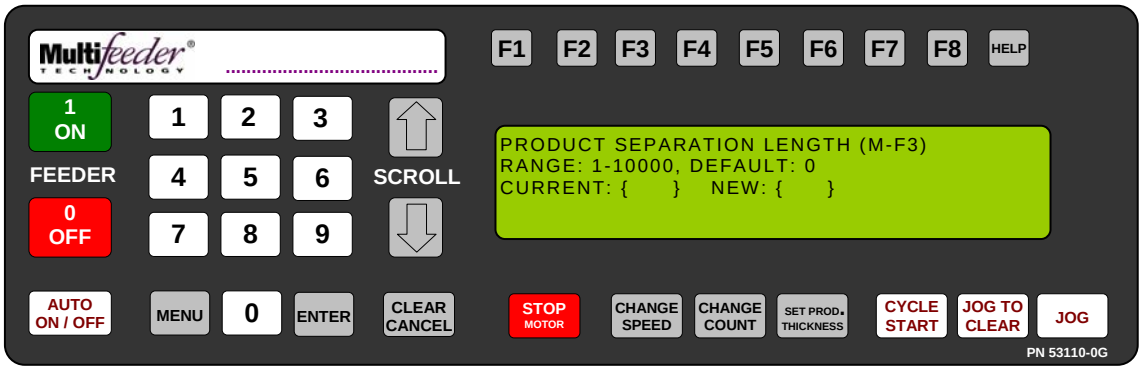


Technician Settings Screen 1 of 3 – Debounce Settings
Signal Period Setting

The Signal Period screen gives the user the option of ignoring from 1 to 10,000 start pulses between accepted start pulses. Again, this function is used primarily when the *Feeder* is integrated with another machine. If the Signal Period is set to 0 each start pulse will be accepted.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 3 | MENU X 9

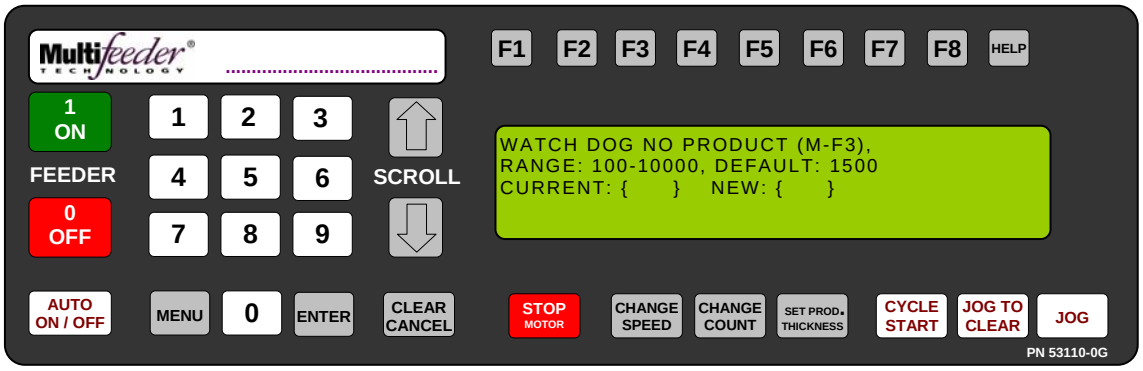


Technician Settings Screen 1 of 3 – Advanced Settings
Product Separation Length Setting

The Product Separation Length is the minimum amount of space between products for *Feeder* to determine that there is a gap. If a product with holes is being fed, the Product Separation Length should be greater then the maximum hole size.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 4

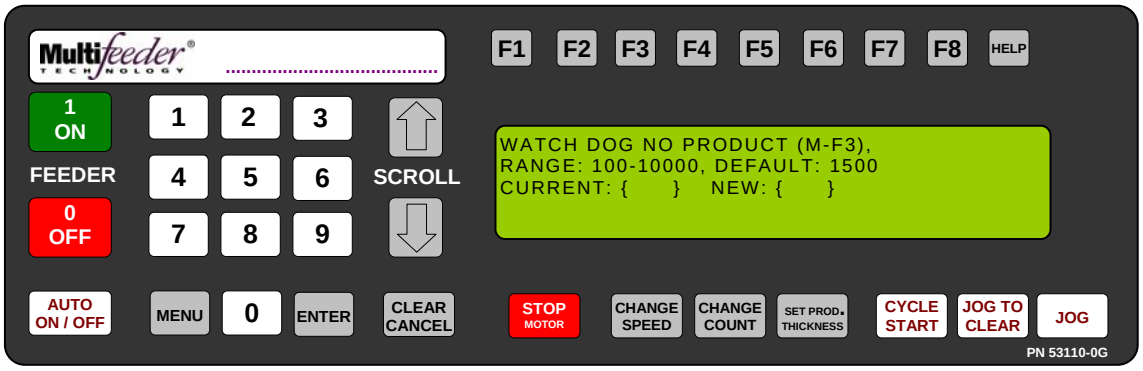


Technician Settings Screen 1 of 3 – Advanced Settings
Watch Dog No Product Setting

A Watch Dog No Product fault occurs when the emitter-receiver pair sees that the discharge belts have traveled more than the allowed distance with no product. The Watch Dog No Product setting allows the user to set that distance. This function prevents the *Feeder* from continuing to run when it is empty. To function properly, the current product length must be stored in the computer's memory, see p29.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 4 MENU

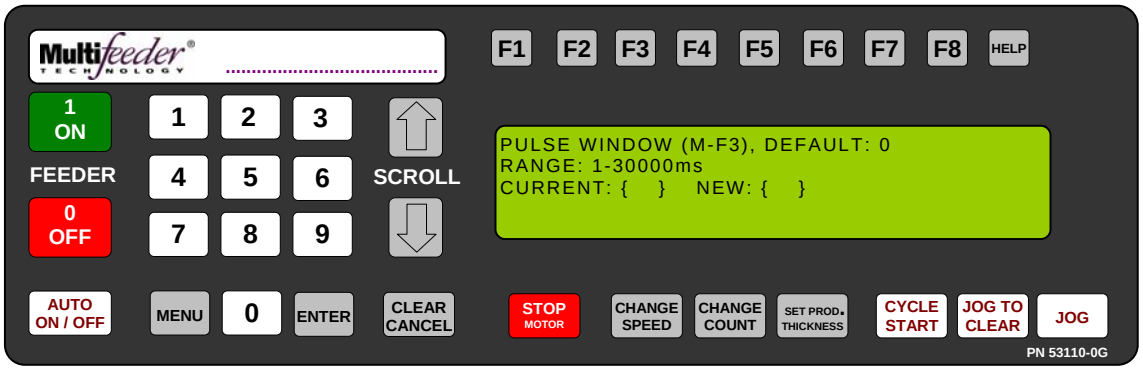


Technician Settings Screen 1 of 3 – Advanced Settings
Minor Jam Faults Setting

This setting allows the *Feeder* to enable/disable minor jam faults. Minor jam faults are caused by product that is slightly overlapping but is not overlapping far enough to cause an MPD fault.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 4 | MENU X 2



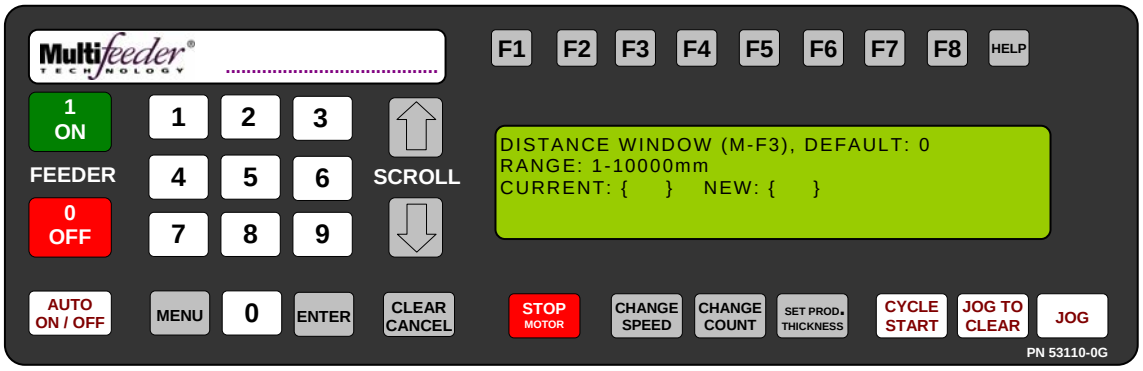
Technician Settings Screen 1 of 3 – Debounce Settings
Pulse Window Setting

The Pulse Window screen gives the user the option of ignoring start pulses occurring between 0 and 30000 milliseconds after the last good start pulse was accepted. This shields the *Feeder* from spurious pulses which may occur during feeding. If the Pulse Window is set to 0 each start pulse will be accepted. This function is not available when using AccuTipping. When using AccuTipping, de-bounce is added to the start pulse through the ADVANCED PSTART settings on p83.

To determine the Pulse Window, a quick calculation must be performed. First, determine the current running speed of the host line in cycles per millisecond. Take the inverse of this number (1/cycles per millisecond) to get our first variable, TIME1. Next, access Demo Mode (Menu 5) to determine the cycles per minute. Convert this value to cycles per millisecond (divide by 60000). Take the inverse of this number to get our second variable, TIME2. Your Pulse Window should be set to TIME1-TIME2. Please note that the time it takes the *Feeder* to dispense one product does not change for different line speeds, unless any parameters are changed or speed compensation is enabled. Then the Pulse Window strictly becomes a function of the line speed.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 4 | MENU X 3

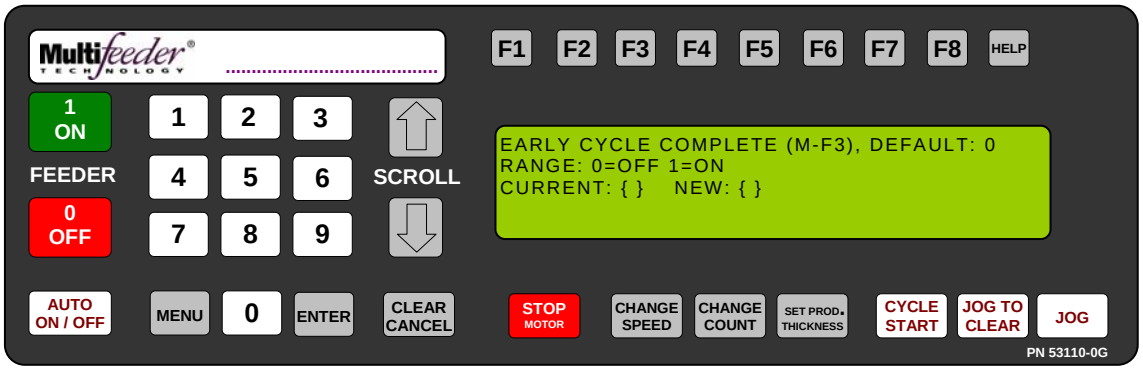


Technician Settings Screen 1 of 3 – Advanced Settings
Distance Window Setting

The Distance Window screen gives the user the option of ignoring start pulses which occur between 1 to 10000mm after the last good start pulse was accepted. This shields the *Feeder* from spurious pulses which may occur during feeding.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 4 | MENU X 4

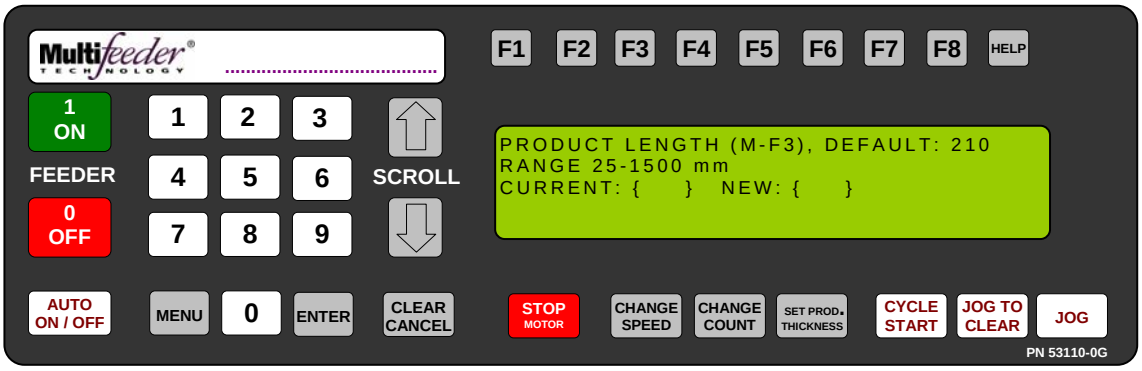


Technician Settings Screen 1 of 3 – Advanced Settings
Early Cycle Complete Setting

When early cycle complete is enabled the cycle complete signal will switch after the last product passes under the product sensor. Normally the cycle complete signal will not switch after the *Feeder* stops on the product, starting the next batch of products.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 4 | MENU X 5

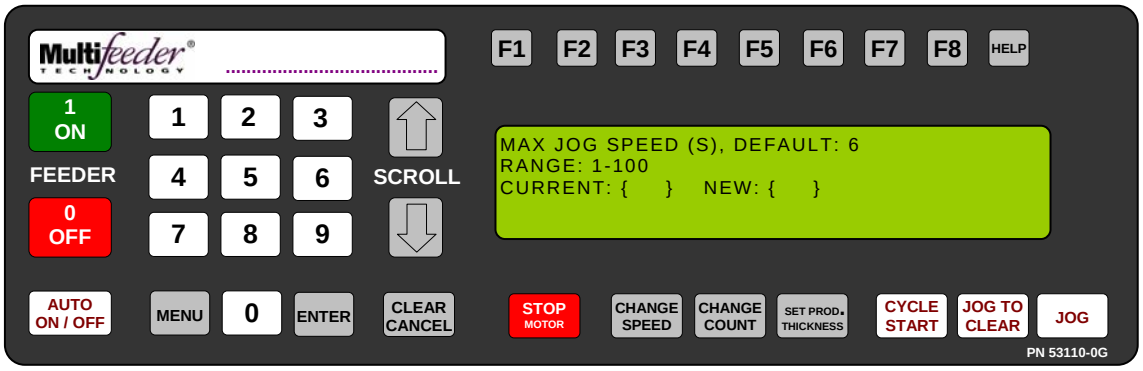


Settings Screen 1
Product Length

Product Length allows the user to store, in the computer's memory, the length of the product being fed. The computer then checks for product jams and multiple product feeds. When Product Length is selected, the program displays the allowable product length range (25mm-1500mm), the current product length, and prompts the user to enter the new product length as shown in the figure above. For your convenience, a ruler has been placed on the *Feeder* housing directly below the membrane keypad. Please note that the product length must be entered in millimeters (25mm = 1in).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 4 | MENU X 6

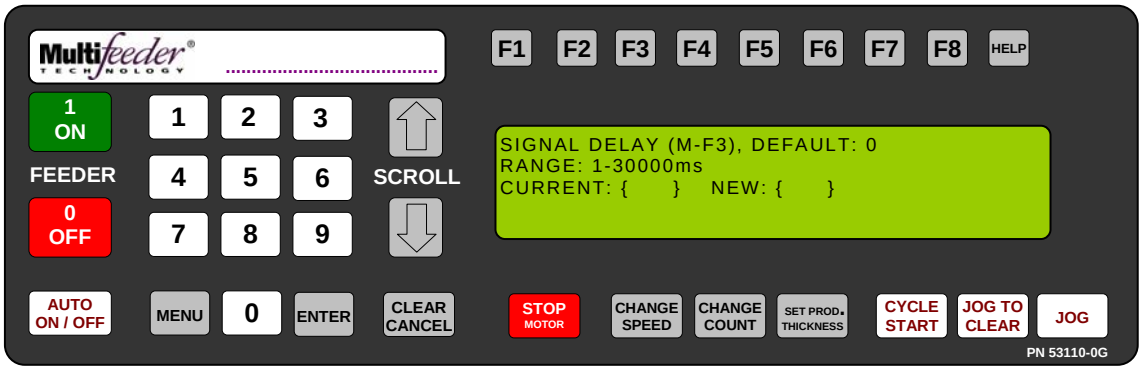


Technician Settings Screen 1 of 3 – Advanced Settings
Maximum Jog Speed Setting

The Max Jog Speed screen allows the user to control the maximum speed at which the Feeder will operate when used in the JOG mode. This function is particularly useful when the "operating" speed is set very high and the user would like the option to jog at a lower speed. However, it is important to note that this function controls the *maximum* jog speed. In other words, when the operating speed is set at a lower speed than the Max Jog Speed, the Feeder will jog at the operating speed. The Max Jog Speed screen shows the allowable Max Jog Speed range (1-100 MPM), the current Max Jog Speed value, and prompts the user to enter a new value. The recommended Max Jog Speed is 20 MPM.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 4 | MENU X 7

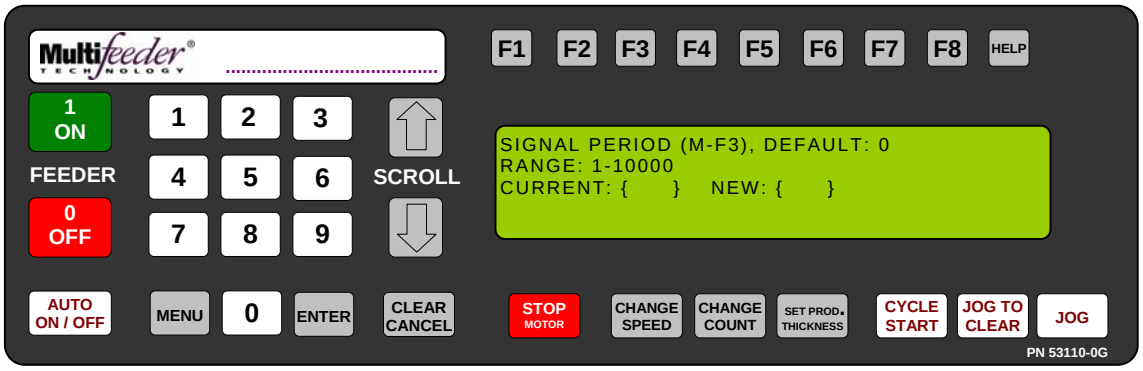


Technician Settings Screen 1 of 3 – Advanced Settings
Signal Delay Setting

The Signal Delay screen gives the user the option of delaying the acknowledgment of the start pulse at the start connector. This function is used primarily when the *Feeder* is integrated with another machine. The signal may be delayed from 1 to 30000 milliseconds (30 seconds). When the delay is set to 0 the start pulse will be acknowledged immediately.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 4 | MENU X 8

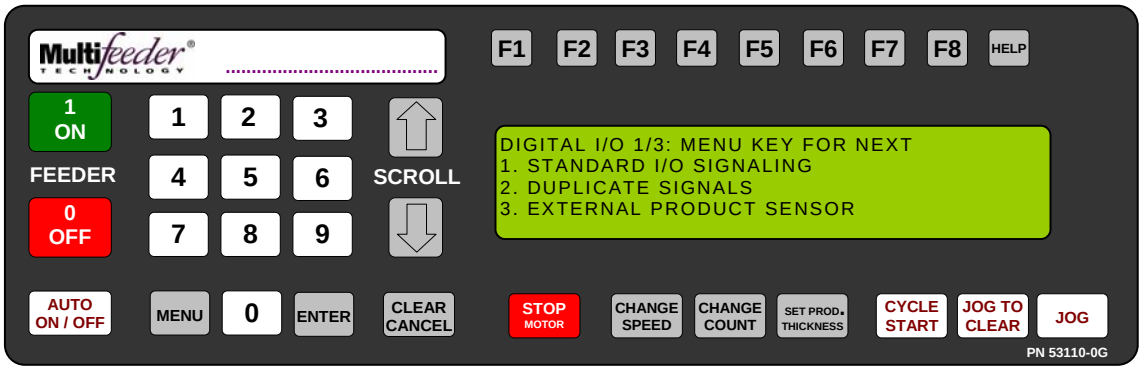


Technician Settings Screen 1 of 3 – Advanced Settings
Signal Period Setting

The Signal Period screen gives the user the option of ignoring from 1 to 10,000 start pulses between accepted start pulses. Again, this function is used primarily when the *Feeder* is integrated with another machine. If the Signal Period is set to 0 each start pulse will be accepted.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

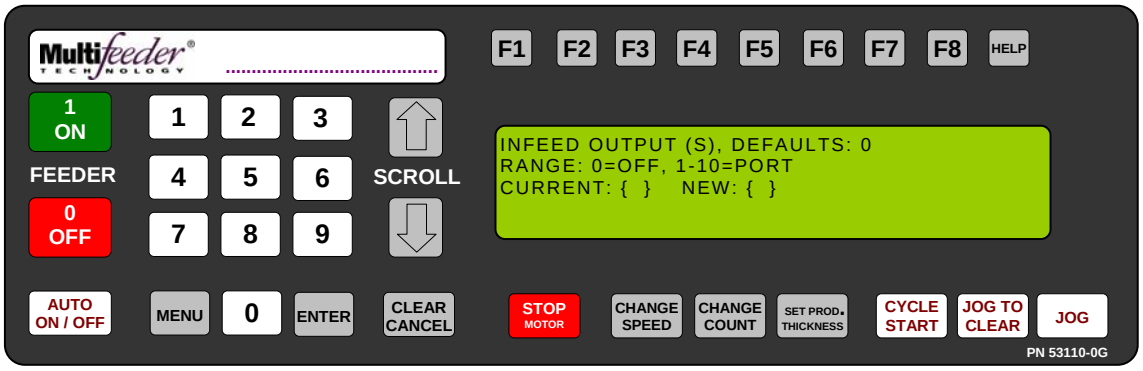
MENU X 2 2 4 MENU X 9



Technician Settings Screen 1 of 3
Digital I/O Screen 1 of 3

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5



Technician Settings Screen 1 of 3 – Digital I/O

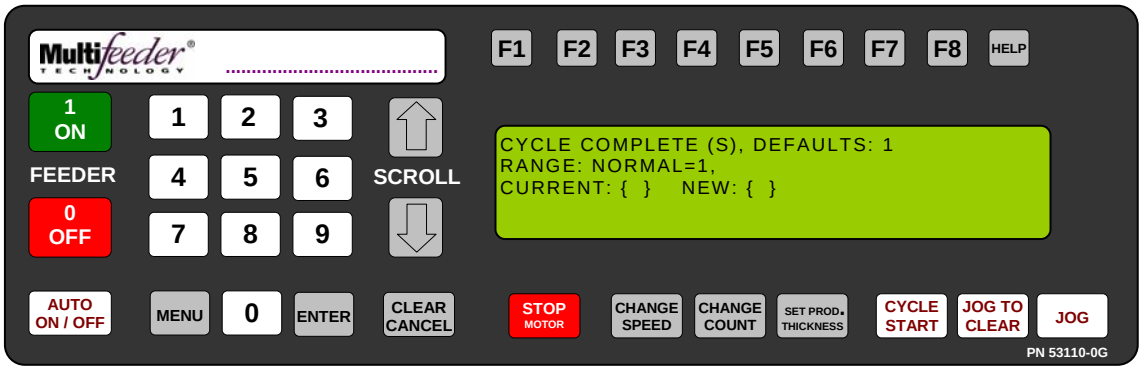
Digital I/O Screen 1 of 3 – Standard I/O Signals

Infeed Output Setting

When this is enabled the *Feeder* will toggle the selected output on an I/O card (purchased separately) while the *Feeder* belts are moving.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1

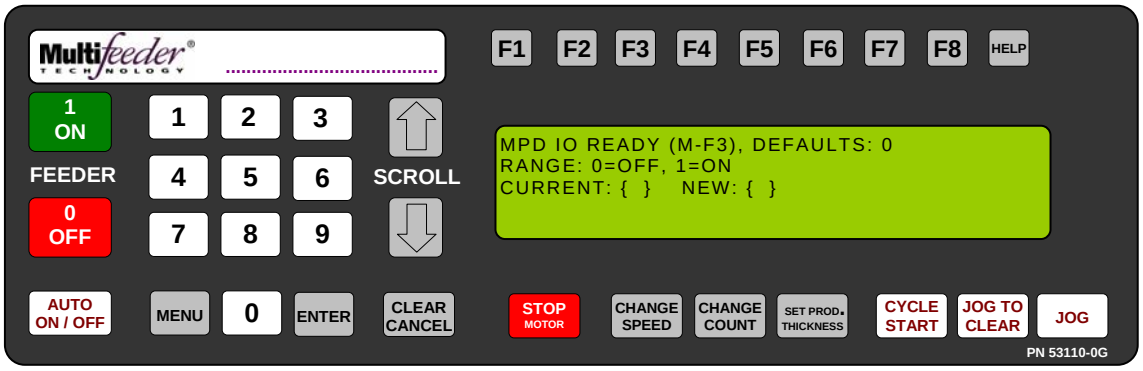


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
Cycle Complete Setting

When this is enabled the *Feeder* will set the selected output on an I/O card (purchased separately) to match the Cycle Complete signal of the J1 connector.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU

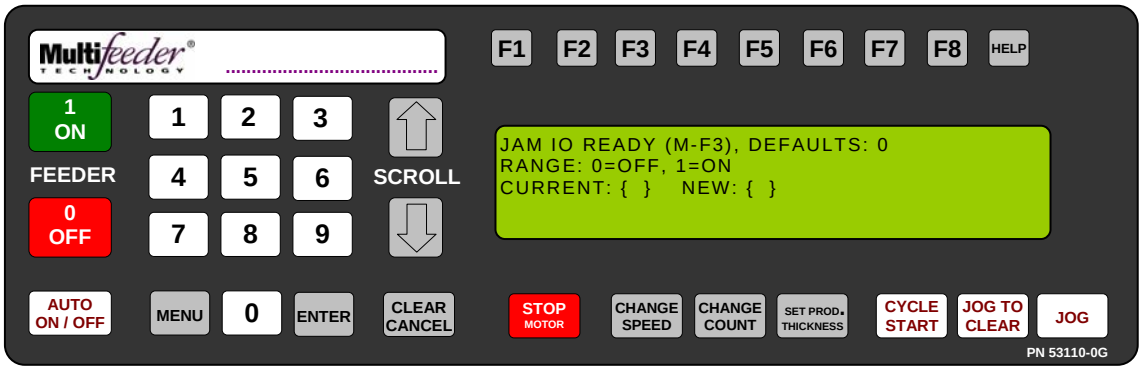


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
MPD I/O Ready Setting

In applications where multiple product feed errors are to be handled by a portion of the system external to the Feeder, the *MPD I/O Ready* feature will provide the signal. With *MPD I/O Ready* enabled (set to 1) the Feeder will signal a multiple product detection by switching the voltage level on P1-J (RDY) from high to low. The Feeder will stay in this condition until the next feed cycle is started. The MPD allowed per hour will override this feature; this will allow the technician to set a breakpoint at which the Feeder will stop feeding multiples.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 2

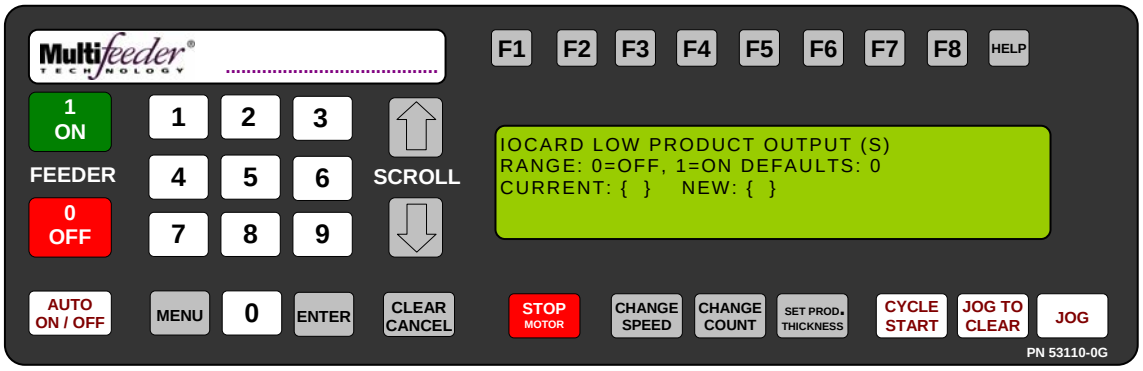


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
Jam IO Ready Setting

In applications where the response to jammed products is handled by a portion of the system external to the Feeder, the *JAM I/O Ready* feature provides the indicator signal. With *JAM I/O Ready* enabled (set to 1) the Feeder will signal a minor jam by turning the voltage level on P1-J (RDY) from high to low. The Feeder will stay in this condition until the next feed cycle is started.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 3

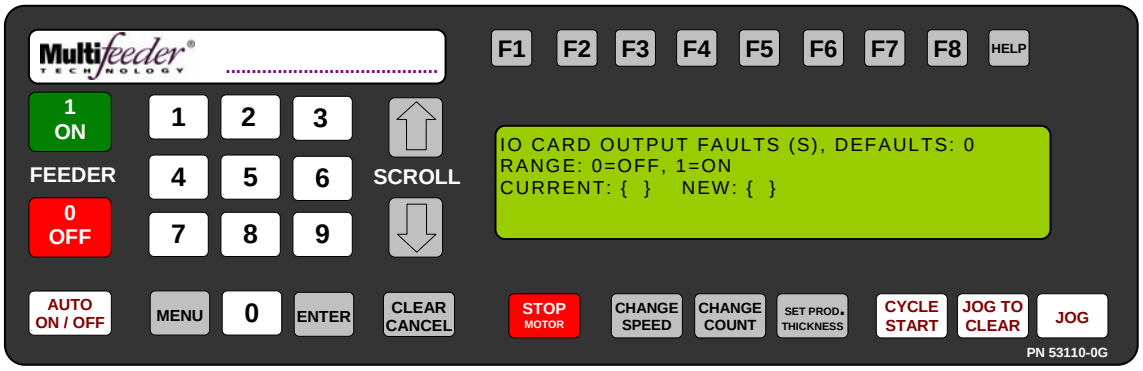


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
I/O Card Low Product Output Setting

Enabling this setting provides a Low Product signal output though the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 4

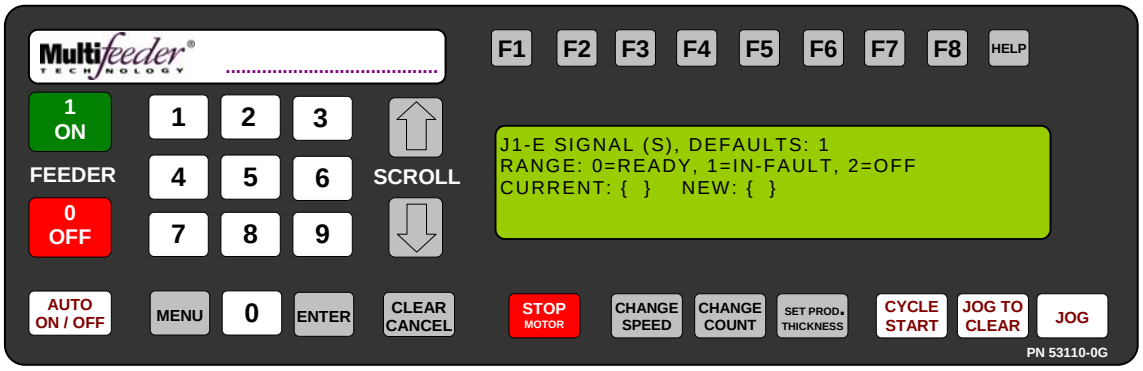


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
I/O Card Output Faults Setting

Enabling this setting provides a Fault signal output though the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 5

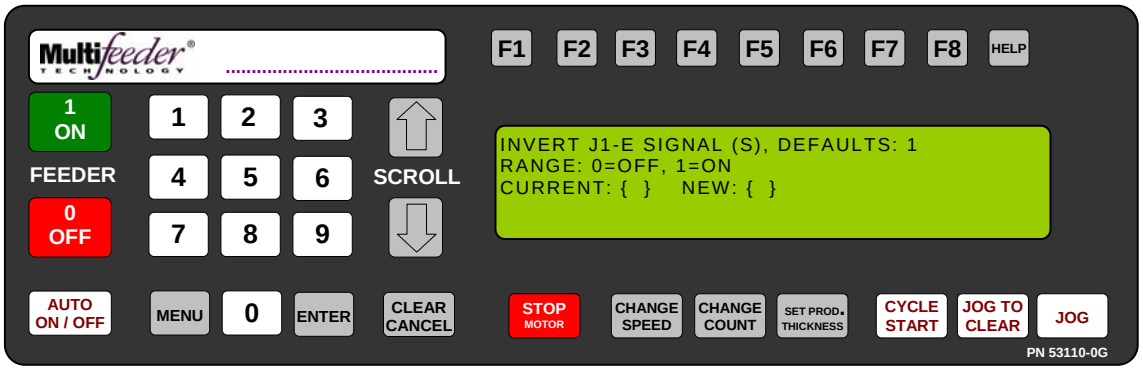


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
J1-E Signal Setting

When in READY mode, the J1-E signal follows the RED/GREEN light state. When in FAULT mode, the J1-E signal is set active during *Feeder* faults. When the fault is cleared the signal is set to in-active.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 6

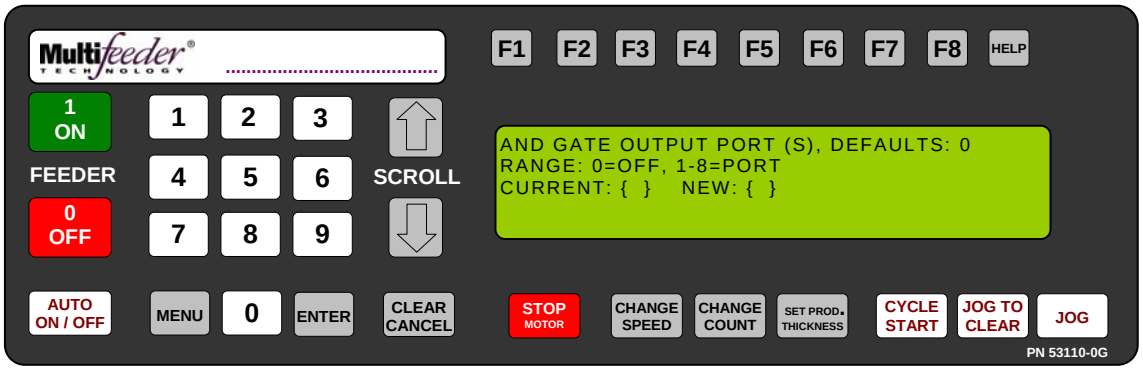


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
Invert J1-E Signal Setting

This setting inverts the J1-E signal state.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 7

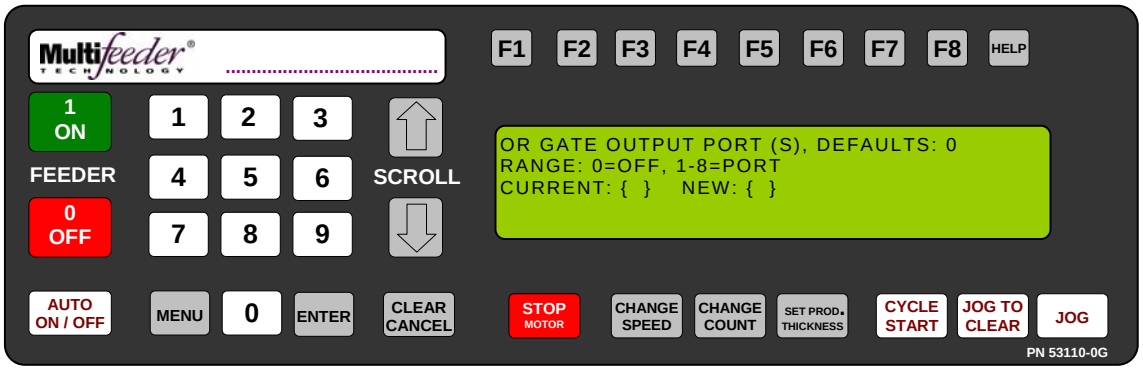


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
AND Gate Output Port Setting

If a *Feeder* has an I/O card (purchased separately) it can use two of the Digital Input Wizards (purchased separately) as an AND gate where the result is output using the selected port.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 8

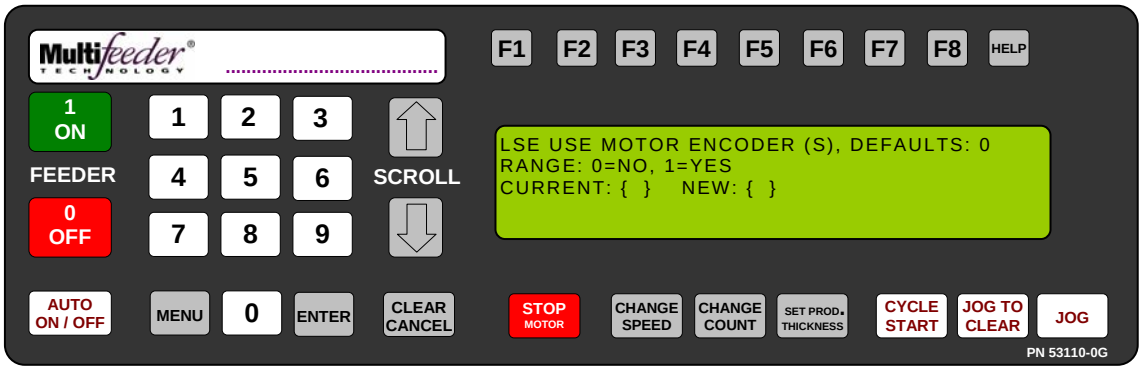


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
OR Gate Output Port Setting

If a *Feeder* has an I/O card (purchased separately) it can use two of the Digital Input Wizards (purchased separately) as an OR gate where the result is output using the selected port.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 9

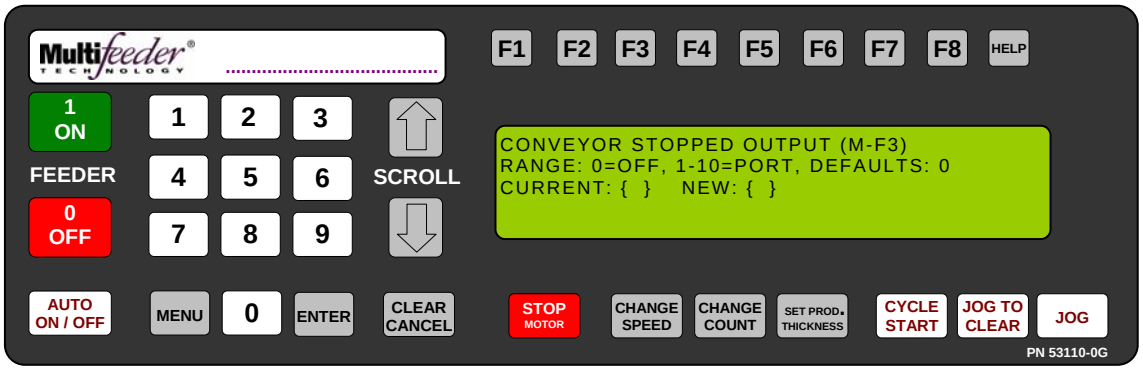


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
LSE Use Motor Encoder Setting

When this is enabled the *Feeder* will use its own motor encoder as a line speed encoder for its calculations. This is useful for applications where a sensor is triggering off of products on the discharge and de-bounce based off of distance is required.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 10

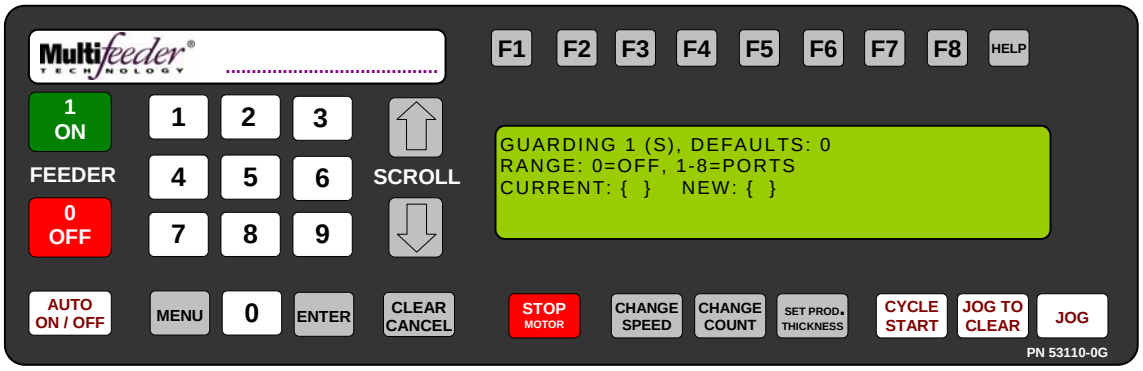


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
Conveyor Stopped Output Setting

When this is enabled the *Feeder* will toggle an output on an I/O card (purchased separately) to signal that the conveyor (using its Line Speed Encoder input) has stopped moving.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 11

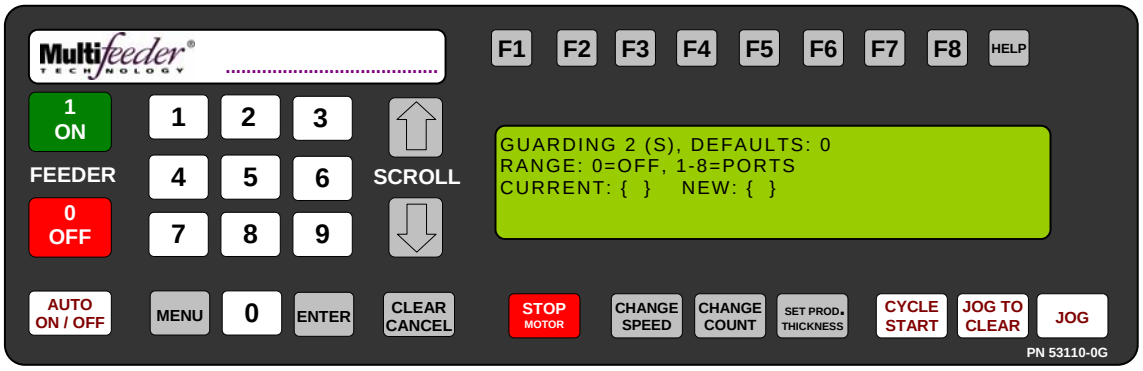


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
Guarding 1 Setting

This setting allows the technician to set which port will be used to indicate when a Guard interlock has been triggered.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 12

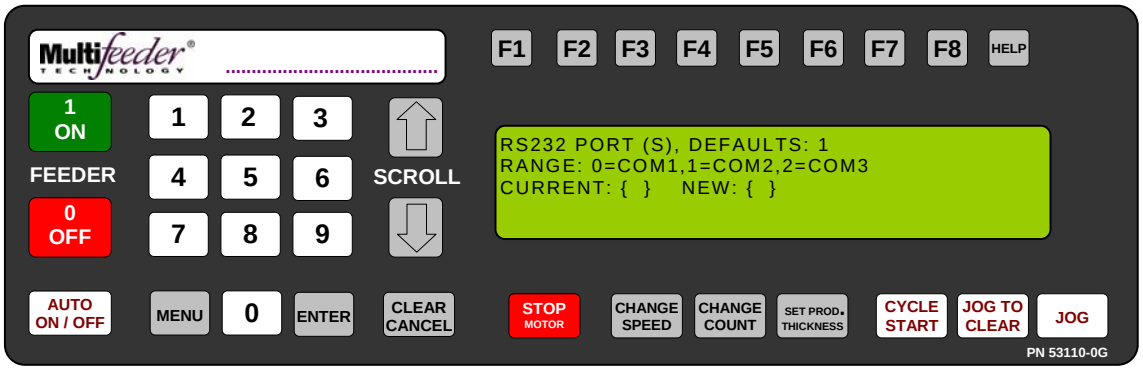


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
Guarding 2 Setting

This setting allows the technician to set which port will be used to indicate when a Guard interlock has been triggered.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5 1 MENU X 13

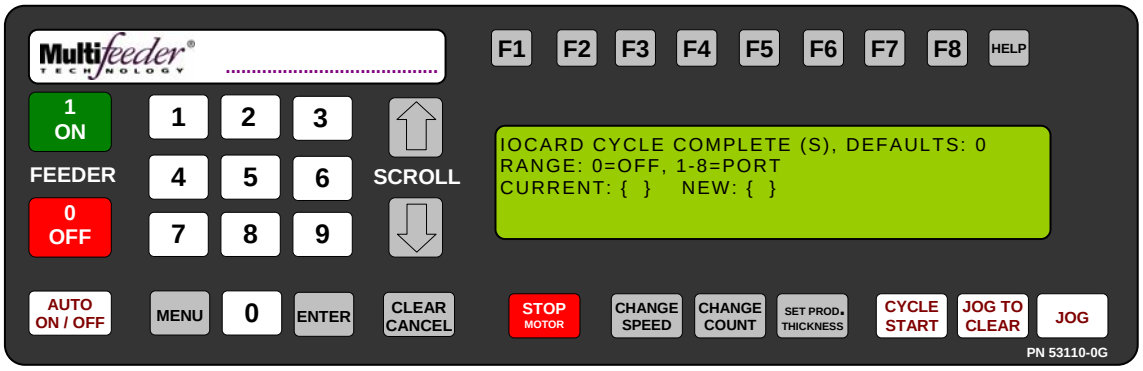


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Standard I/O Signals
RS232 Port Setting

This setting assings the RS-232 comport setting.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 1 | MENU X 14

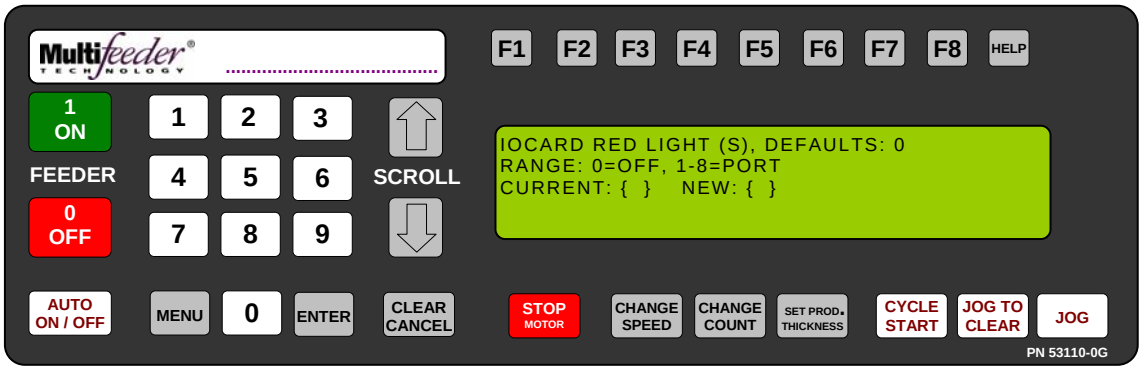


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Duplicate Signals
I/O Card Cycle Complete Setting

This screen sets the port of the Cycle Complete output signal on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5 2

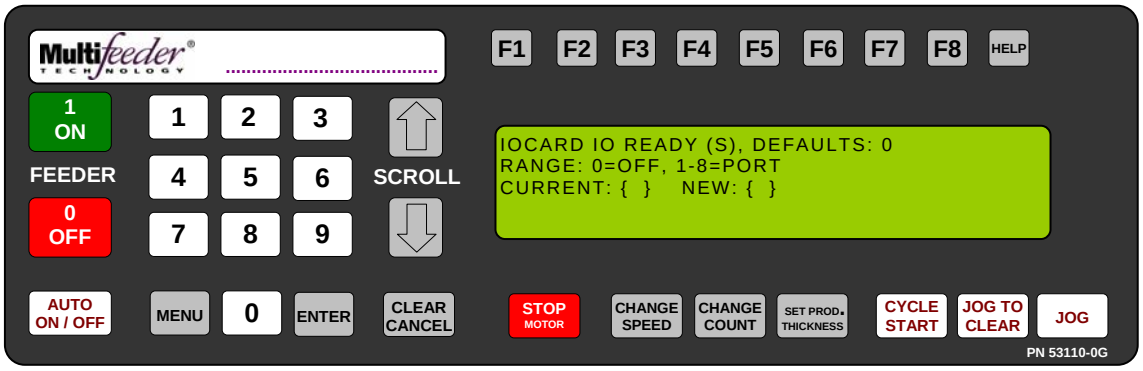


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Duplicate Signals
I/O Card Red Light Setting

This screen sets the port of the Red Light output signal on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5 2 MENU

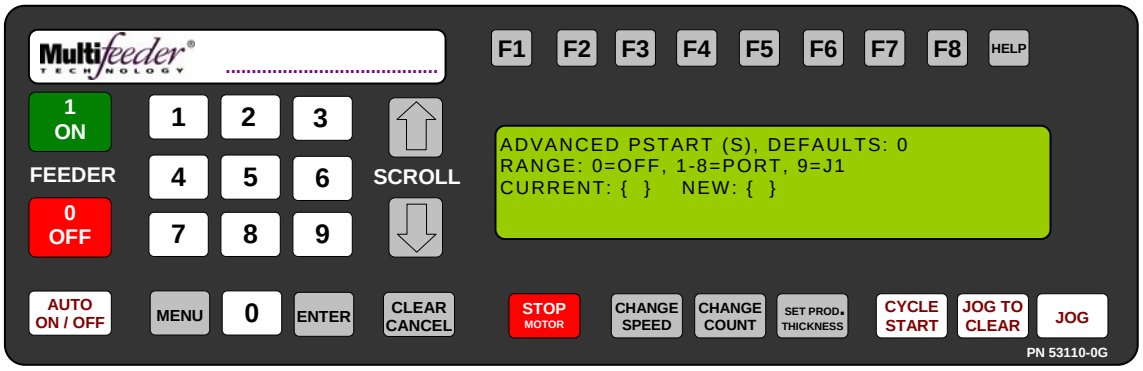


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Duplicate Signals
I/O Card I/O Ready Setting

This screen sets the port of the I/O Ready output signal on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 2 | MENU X 2

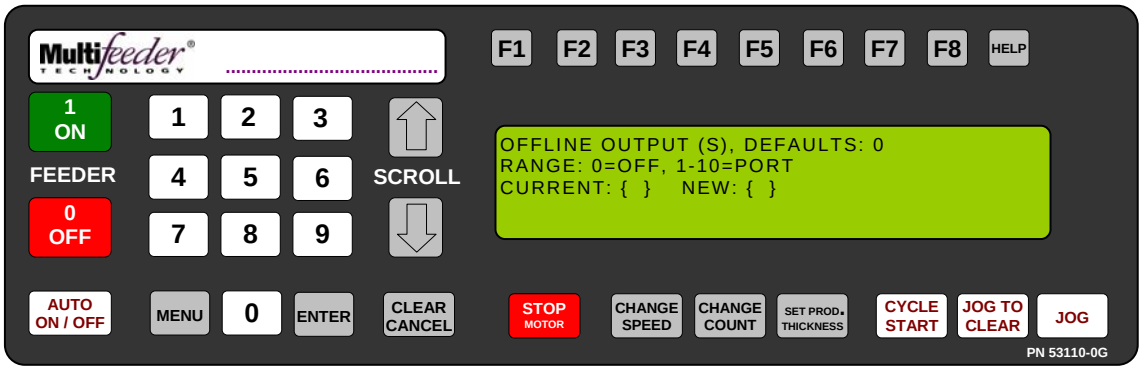


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Duplicate Signals
Advanced PStart Setting

This screen sets the port of the Advanced PStart output signal on the IO Card (purchased separately).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 2 | MENU X 3

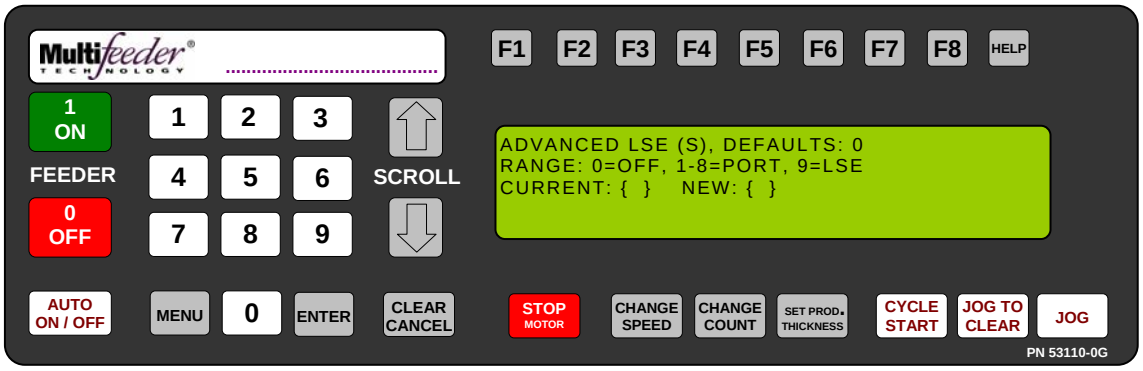


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Duplicate Signals
Offline Output Setting

This screen sets the port of the Feeder Offline output signal on the IO Card (purchased separately).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | 2 | MENU X 6

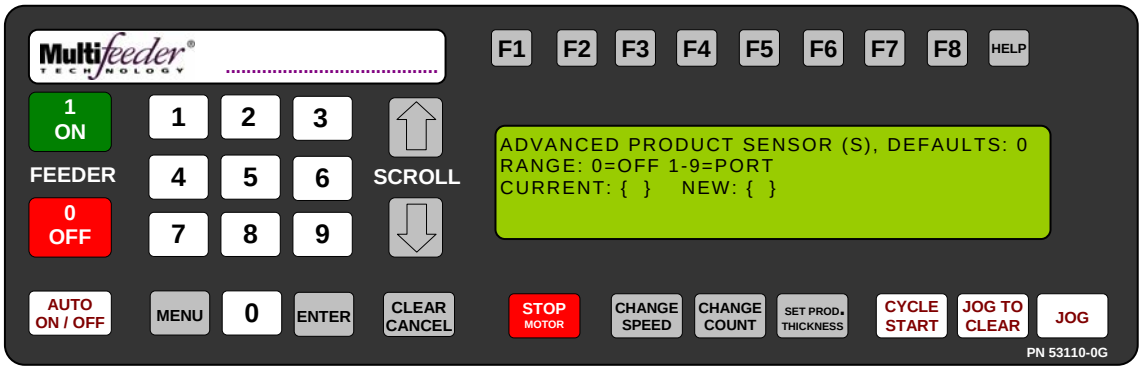


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – Duplicate Signals
Advanced LSE Setting

This screen sets the port of the Advanced LSE (Line Speed Encoder) output signal on the IO Card (purchased separately).

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5 2 MENU X 7

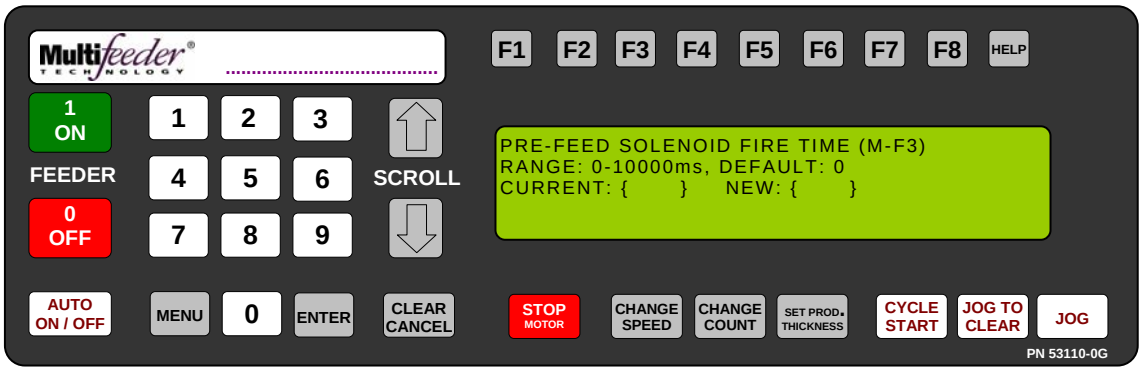


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 1 of 3 – External Product Sensor
Advanced Product Sensor Setting

When this is enabled the *Feeder* will use a selected input from an I/O card (purchased separately) to detect the presence/absence of a product instead of the standard product sensor on the *Feeder* . This is useful in cases where a specialized product sensor is needed to properly track the product.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5 3

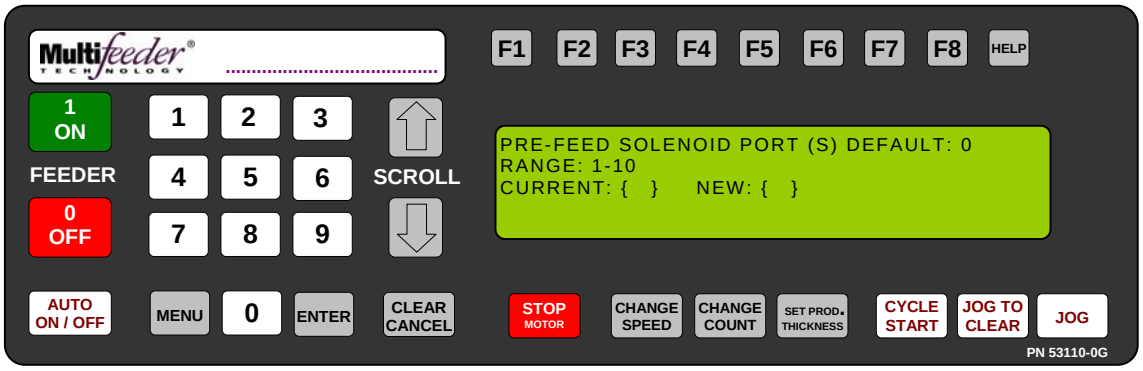


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 - Pre-Feed Signals
Pre-Feed Solenoid Fire Time

The Pre-Feed Solenoid Fire Time is a signal that can be output from the optional I/O Card BEFORE the Feeder starts a feed cycle.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 1

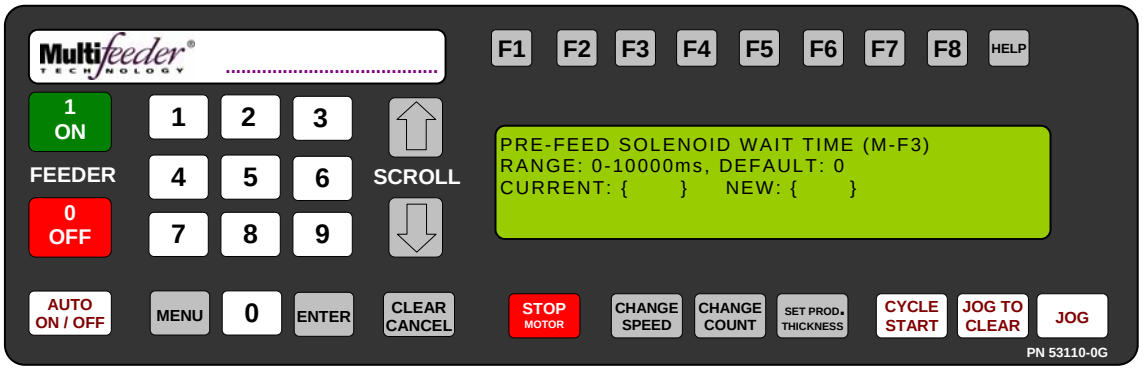


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 - Pre-Feed Signals
Pre-Feed Solenoid Port

This screen is available if the Pre-Feed Solenoid Fire Time value is greater than 0ms. This screen sets the Pre-Feed Solenoid output port.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5 MENU 1 MENU

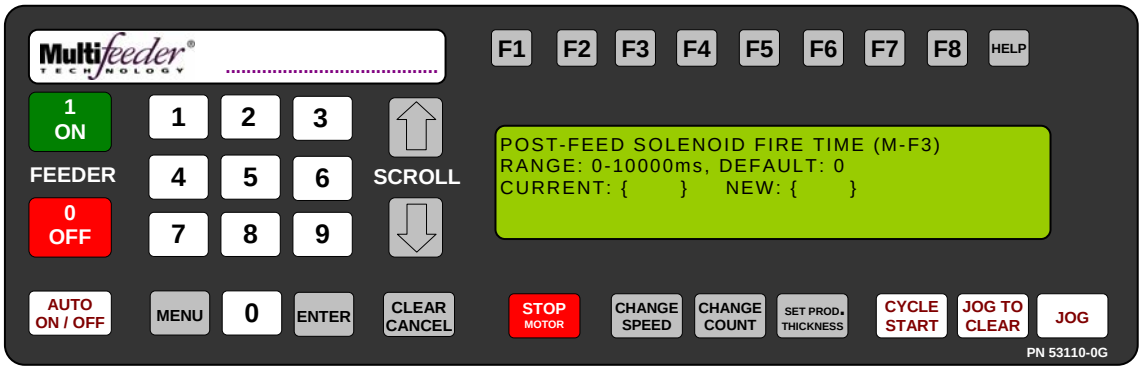


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 - Pre-Feed Signals
Pre-Feed Solenoid Wait Time

This screen is available if the Pre-Feed Solenoid Fire Time value is greater than 0ms. This screen sets the delay time for the Pre-Feed Solenoid output signal.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 1 | MENU X 2

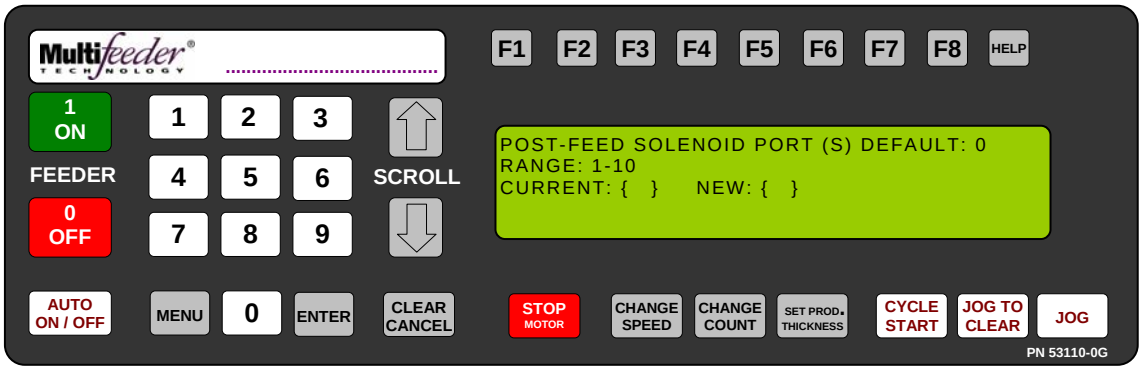


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 – Post-Feed Signals
Post-Feed Solenoid Fire Time

The Post Feed Solenoid Fire Time is a signal that can be output from the optional I/O Card AFTER the Feeder completes a feed cycle.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 2

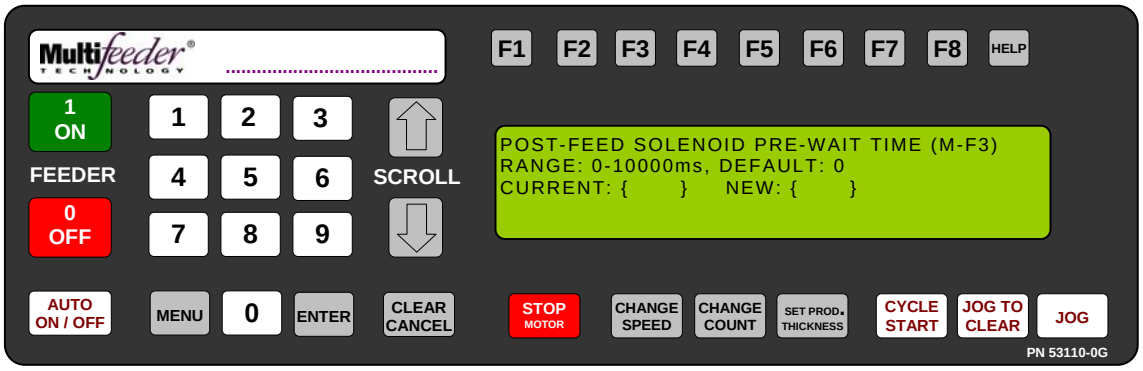


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 – Post-Feed Signals
Post-Feed Solenoid Port

This screen is available if the Post-Feed Solenoid Fire Time value is greater than 0ms. This screen sets the Post-Feed Solenoid output port.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 2 | MENU

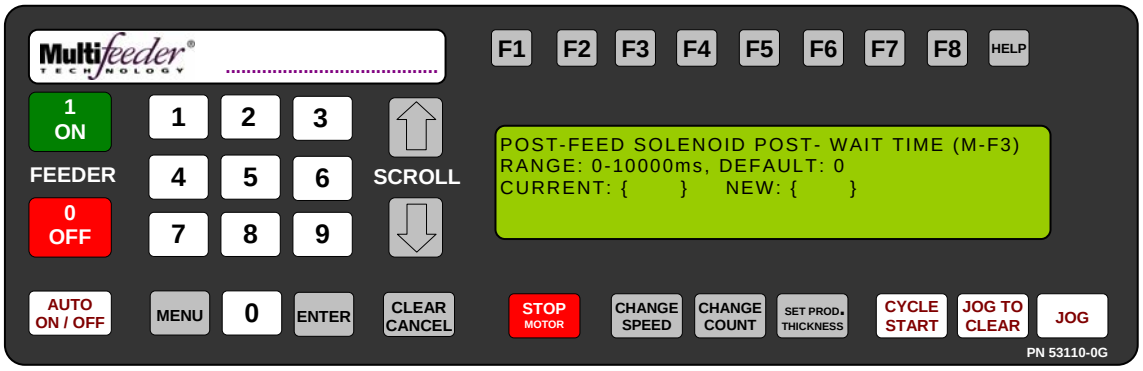


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 - Post-Feed Signals
Post-Feed Solenoid Pre-Wait Time

This screen is available if the Post-Feed Solenoid Fire Time value is greater than 0ms. This screen sets the delay time for the BEFORE Post-Feed Solenoid output signal.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 2 | MENU X 2

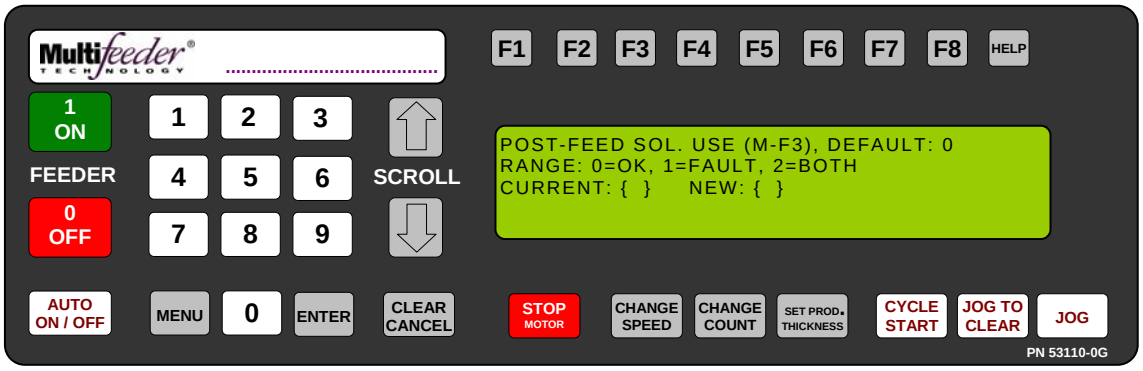


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 - Post-Feed Signals
Post-Feed Solenoid Post-Wait Time

This screen is available if the Post-Feed Solenoid Fire Time value is greater than 0ms. This screen sets the delay time for the AFTER Post-Feed Solenoid output signal.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 1 | MENU X 3

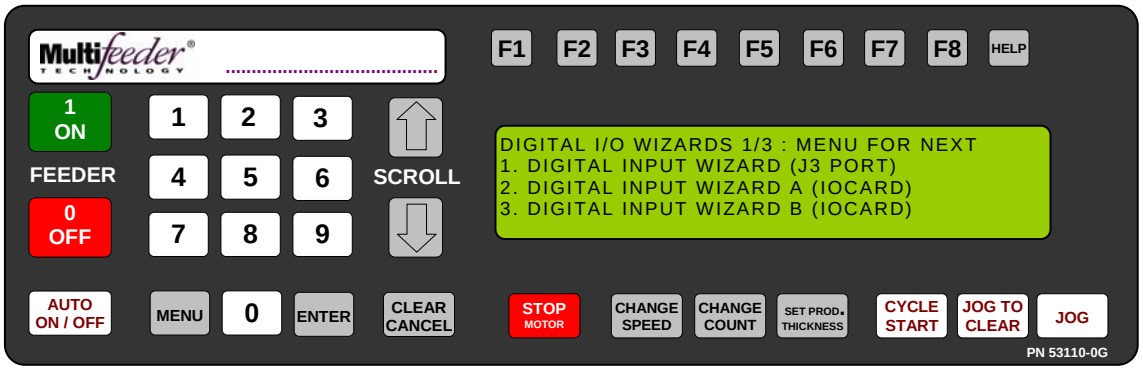


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 - Post-Feed Signals
Post-Feed Solenoid Use Screen

This screen is available if the Pre-Feed Solenoid Fire Time value is greater than 0ms. The Post-Feed will trigger only when the Feeder is not in a fault condition for setting 0(OK) and 2(Both). When set to 1(Faults) the Feeder will only trigger the Pre-Feed Solenoid when in a fault condition.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 2 | MENU X 4

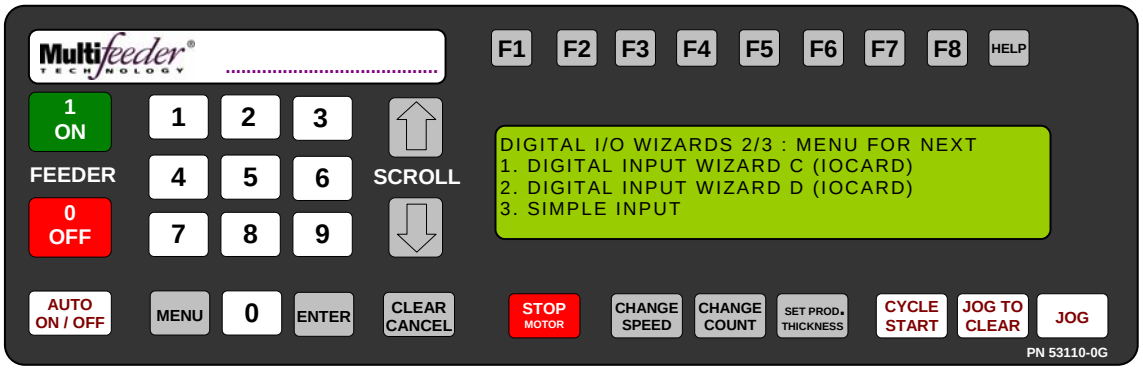


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 – Digital I/O Wizards 1 of 3

Please refer to the *Wizards Manual*.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 3

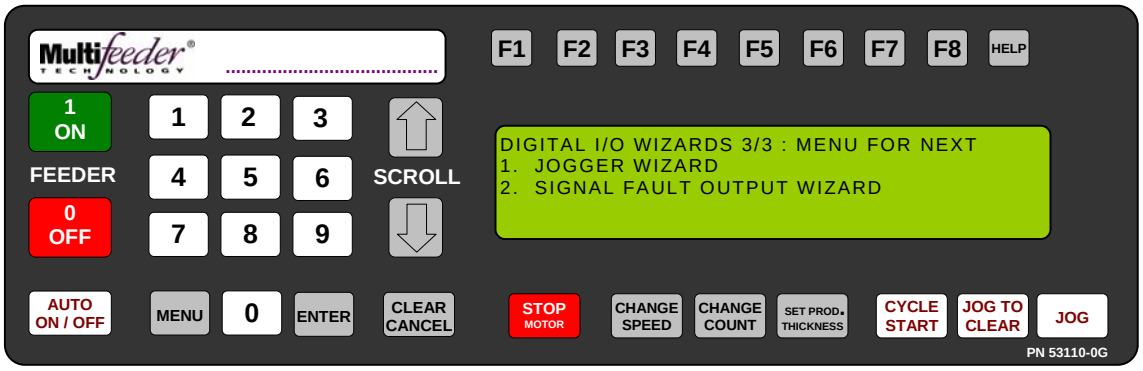


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 – Digital I/O Wizards 2 of 3

Please refer to the *Wizards Manual*.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU | 3 | MENU

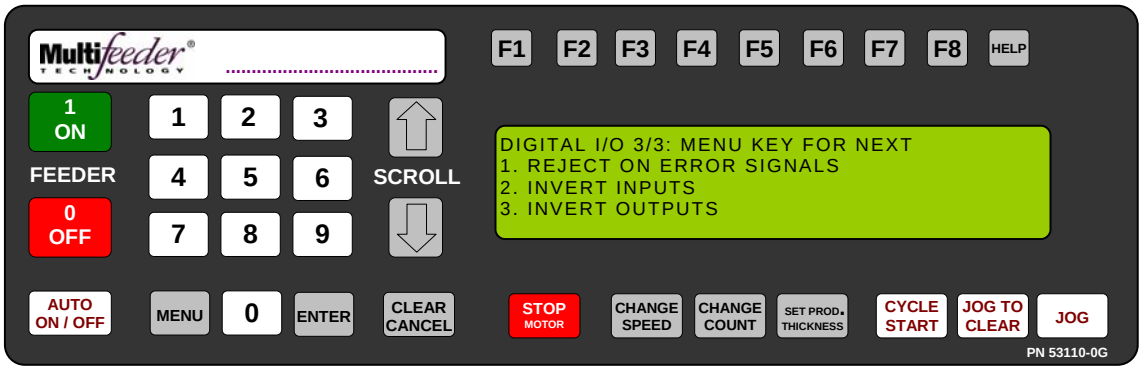


Technician Settings Screen 1 of 3 – Digital I/O
Digital I/O Screen 2 of 3 – Digital I/O Wizards 3 of 3

Please refer to the *Wizards Manual*.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

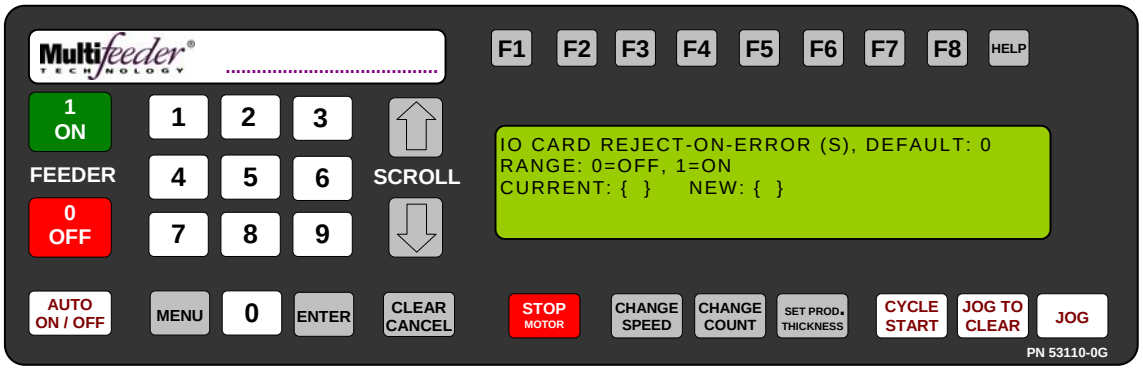
MENU X 2 | 2 | 5 | MENU | 3 | MENU X 2



Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2

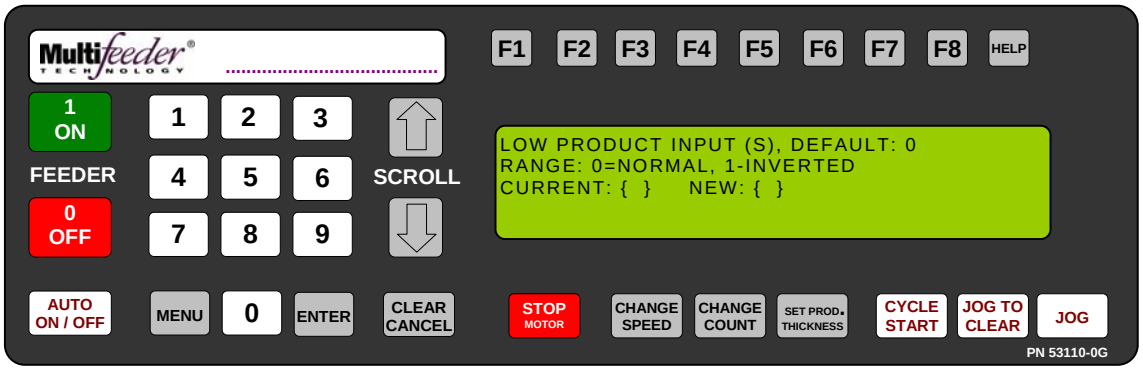


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 - Reject on Error Signals
IO Card Reject-on-Error.

The Reject-On-Error Output can be configured to drive any one of the optically isolated outputs on the I/O CARD (purchased separately) from the point where a Multiple Product Detect (MPD) or minor JAM is found up until the next feed cycle is started. The Reject-On-Error signal will also go back low if the clear key, jog, or jog-to-clear functions are run. The signal is meant to be processed by an external device capable of removing the product as it leaves the System. If an MPD is discovered in the distance leading up to the stop position of a product (when the System is decelerating to a stop) then the output will fire immediately preceding the next feed cycle. It does not fire earlier since the product is not technically leaving the System until the next feed cycle.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 1

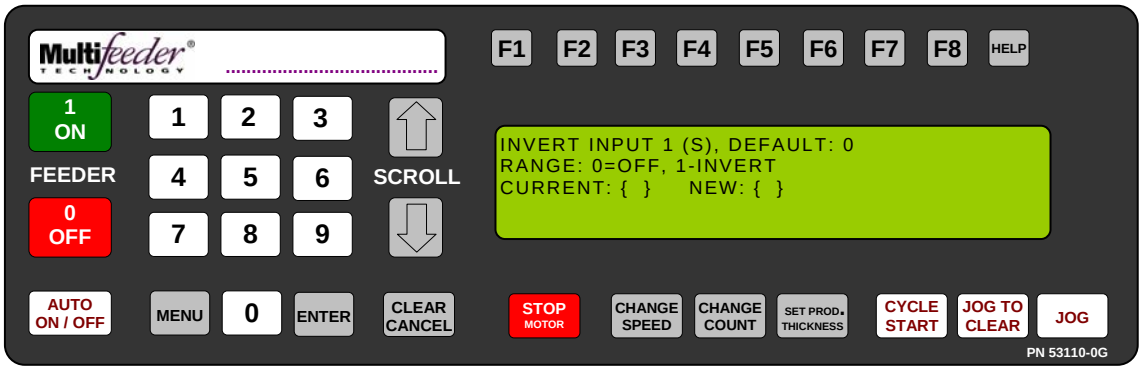


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Low Product Input

The *Low Product Input* screen allows the operator to invert the Low Product signal.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5 MENU X 2 2

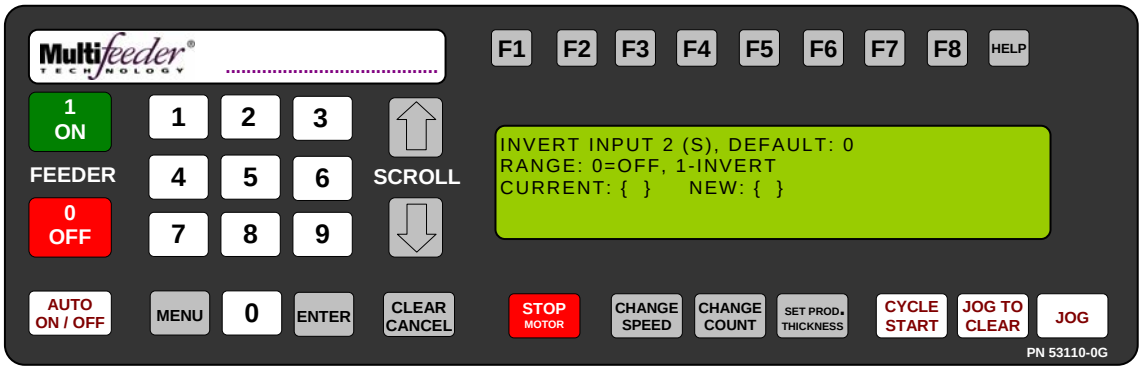


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Invert Input 1

The *Invert Input 1* screen allows the operator to invert Input 1 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 2 | MENU

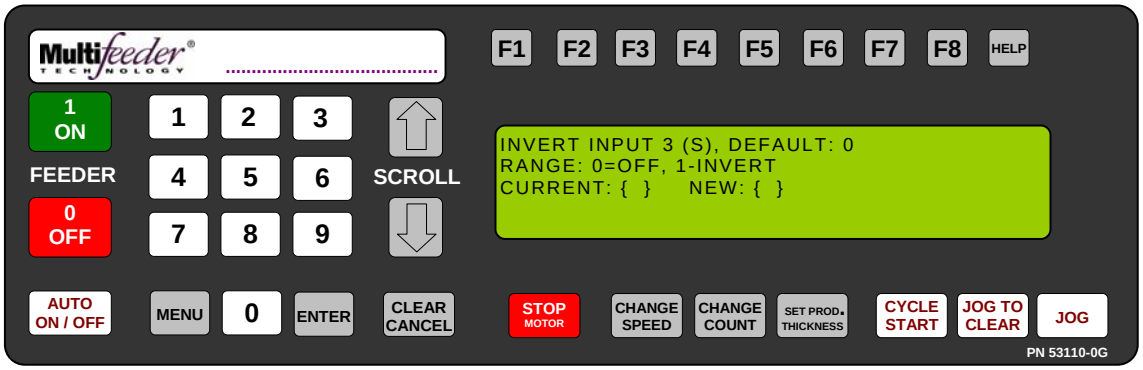


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Invert Input 2

The *Invert Input 2* screen allows the operator to invert Input 2 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 2 | MENU X 2

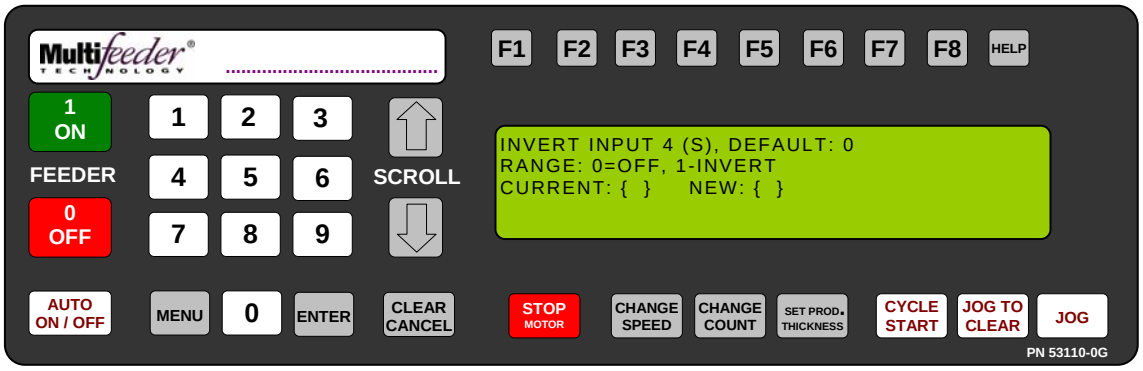


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Invert Input 3

The *Invert Input 3* screen allows the operator to invert Input 3 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 2 | MENU X 3

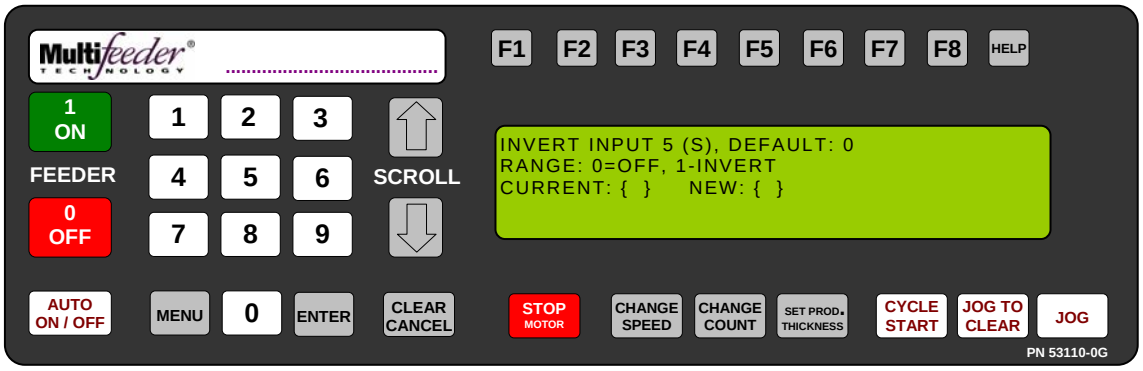


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Invert Input 4

The *Invert Input 4* screen allows the operator to invert Input 4 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 2 | MENU X 4

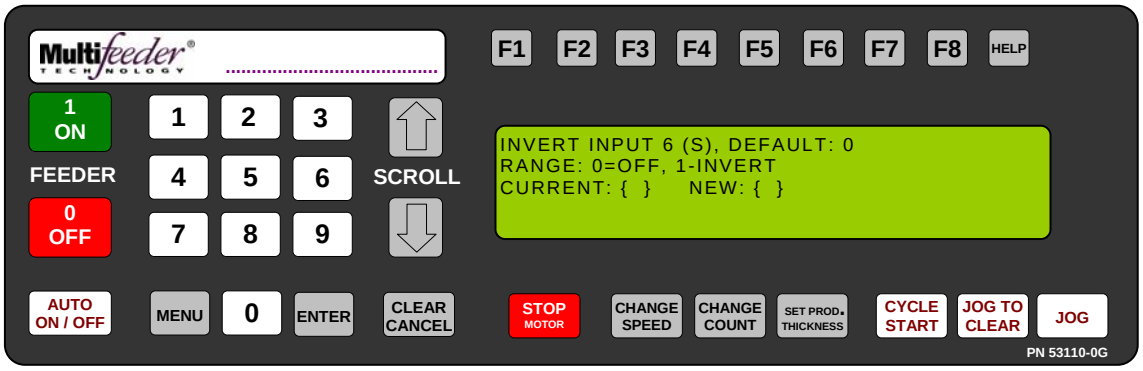


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Invert Input 5

The *Invert Input 5* screen allows the operator to invert Input 5 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 5 MENU X 2 2 MENU X 5

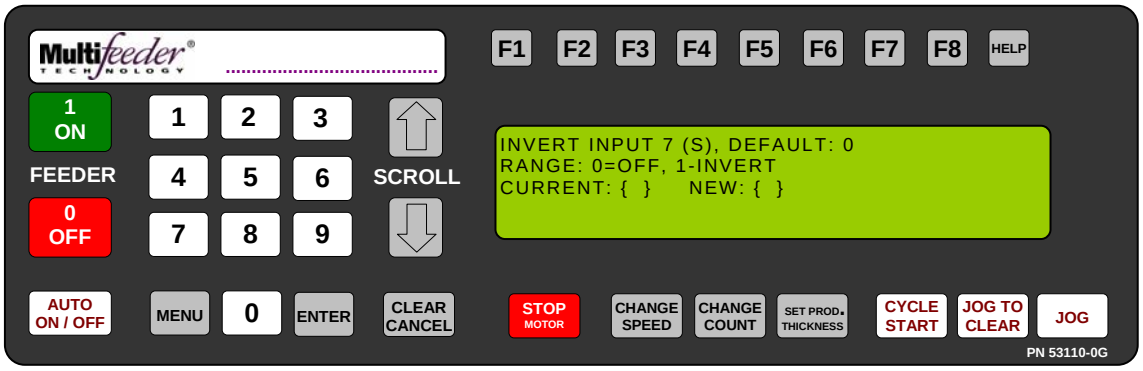


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Invert Input 6

The *Invert Input 6* screen allows the operator to invert Input 6 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 2 | MENU X 6

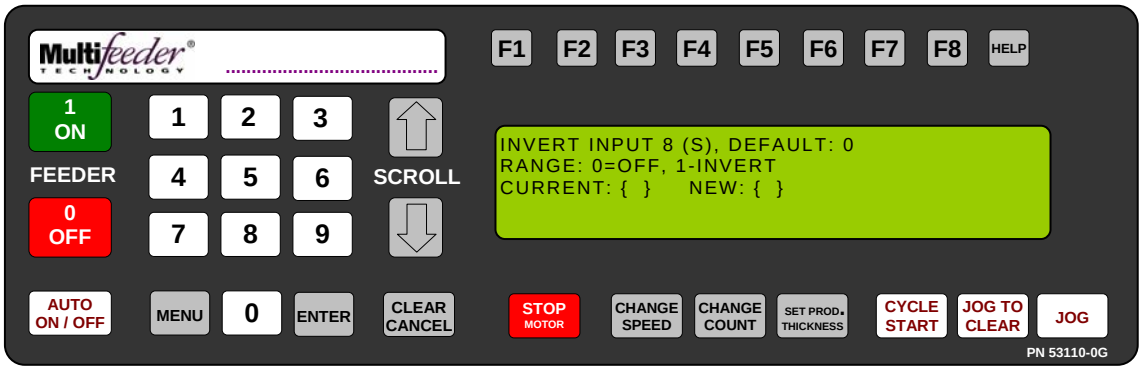


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Invert Input 7

The *Invert Input 7* screen allows the operator to invert Input 7 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 2 | MENU X 7

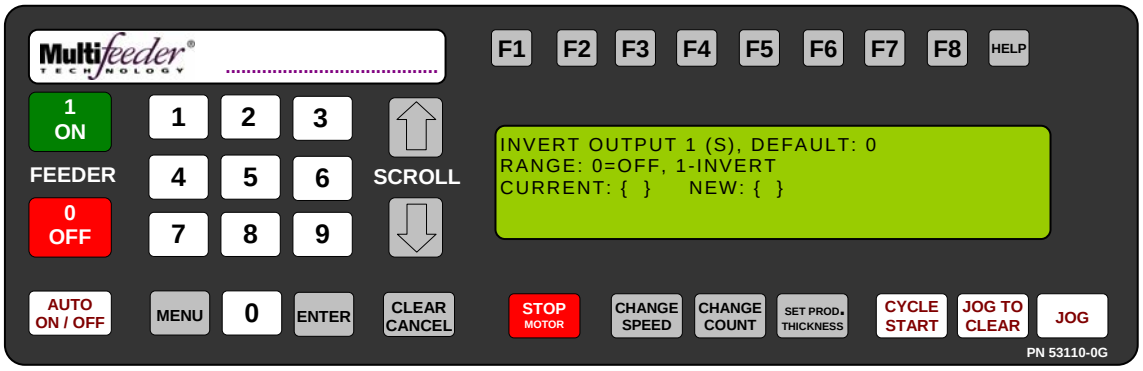


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Inputs
Invert Input 8

The *Invert Input 4* screen allows the operator to invert Input 4 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 2 | MENU X 8

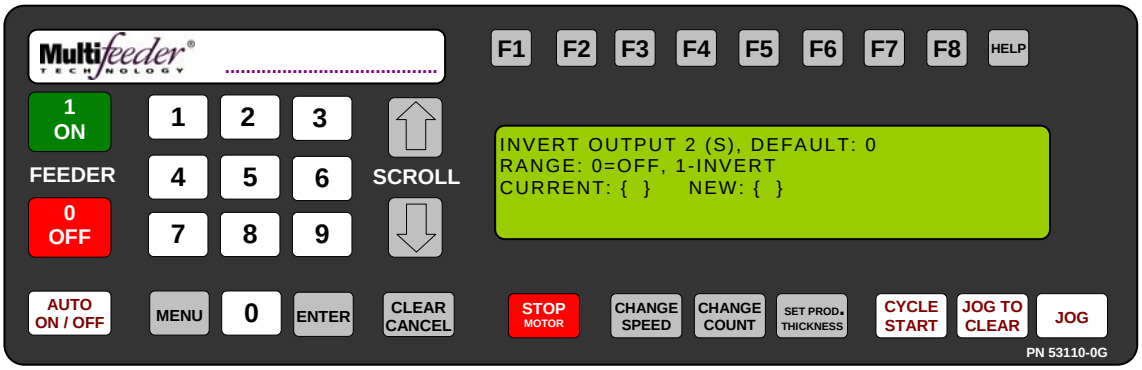


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Output Inputs
Invert Output 1

The *Invert Output 1* screen allows the operator to invert output 1 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3

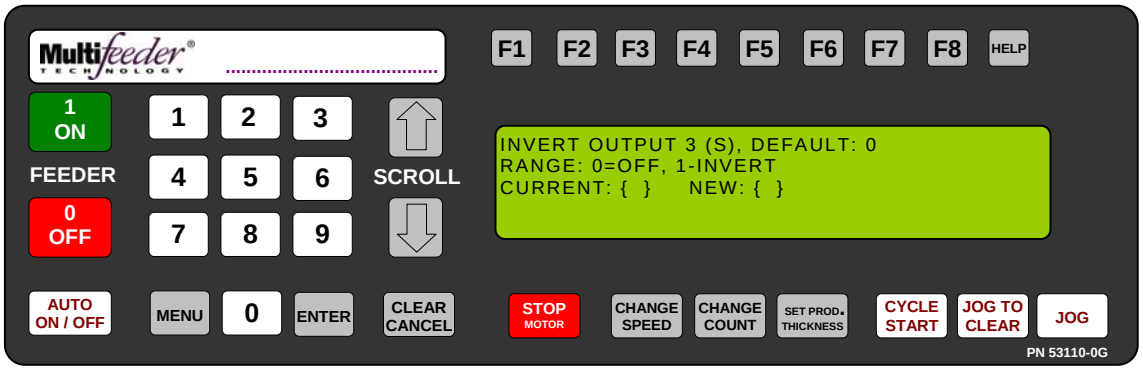


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 2

The *Invert Output 2* screen allows the operator to invert output 2 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU

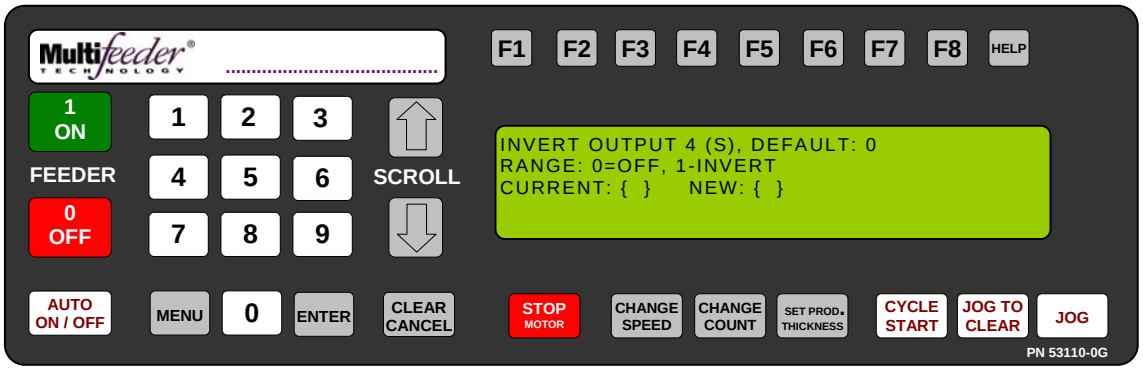


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 3

The *Invert Output 3* screen allows the operator to invert output 3 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU X 2

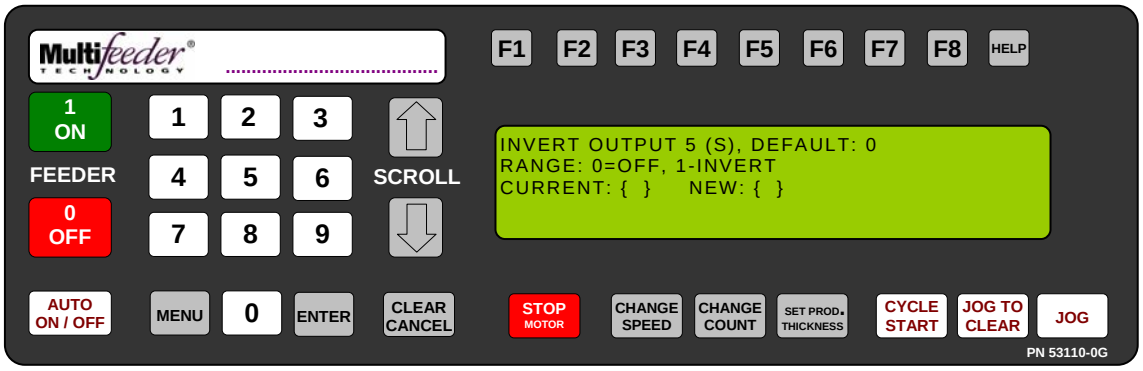


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 4

The *Invert Output 4* screen allows the operator to invert output 4 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU X 3

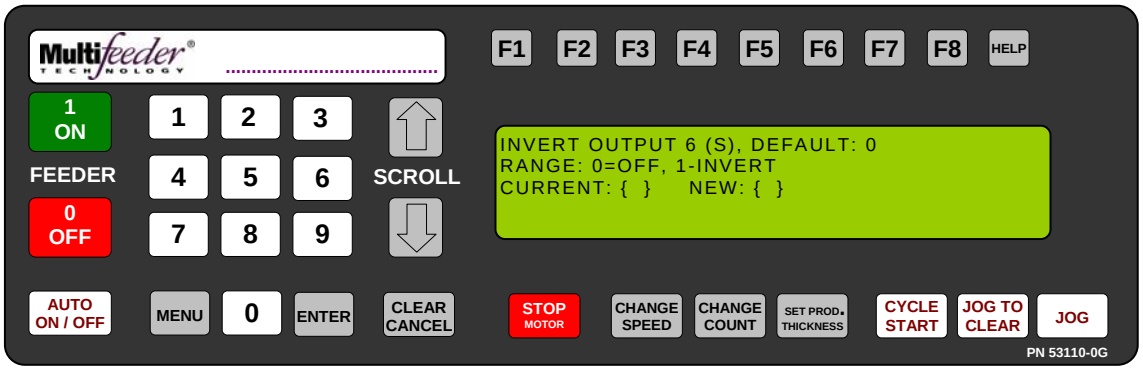


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 5

The *Invert Output 5* screen allows the operator to invert output 5 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU X 4

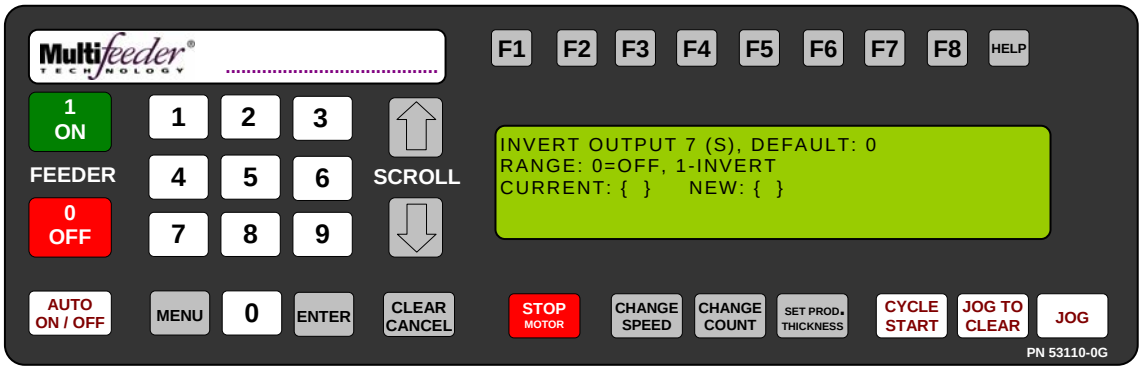


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 6

The *Invert Output 6* screen allows the operator to invert output 6 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU X 5

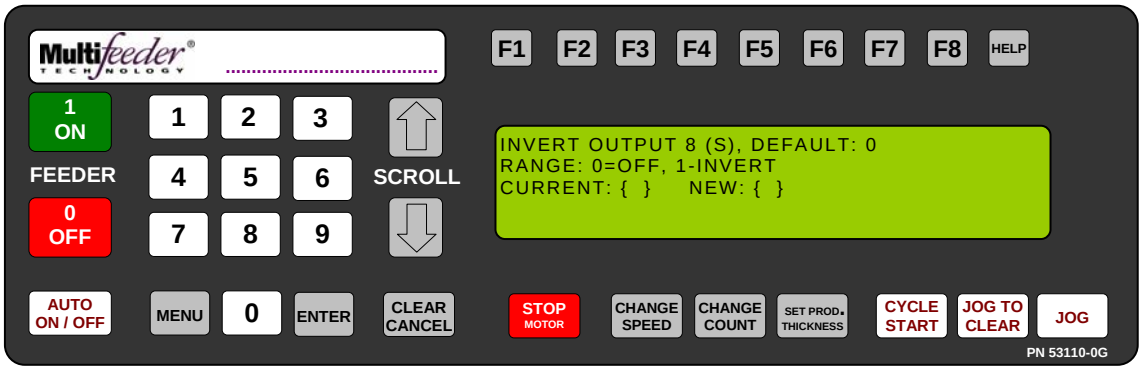


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 7

The *Invert Output 7* screen allows the operator to invert output 7 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU X 6

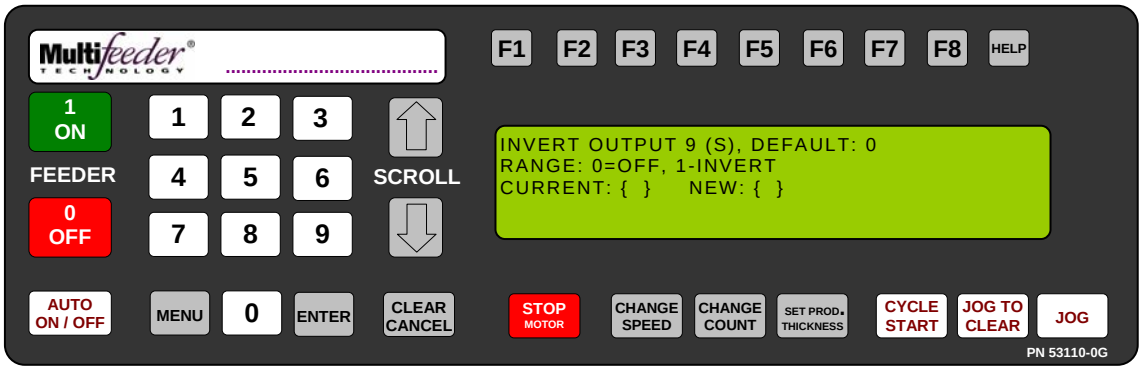


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 8

The *Invert Output 8* screen allows the operator to invert output 8 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU X 7

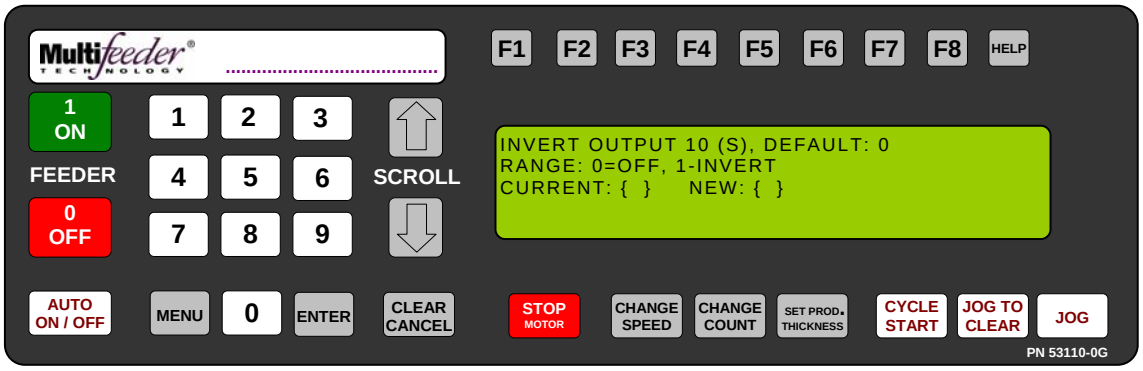


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 9

The *Invert Output 9* screen allows the operator to invert output 9 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU X 8

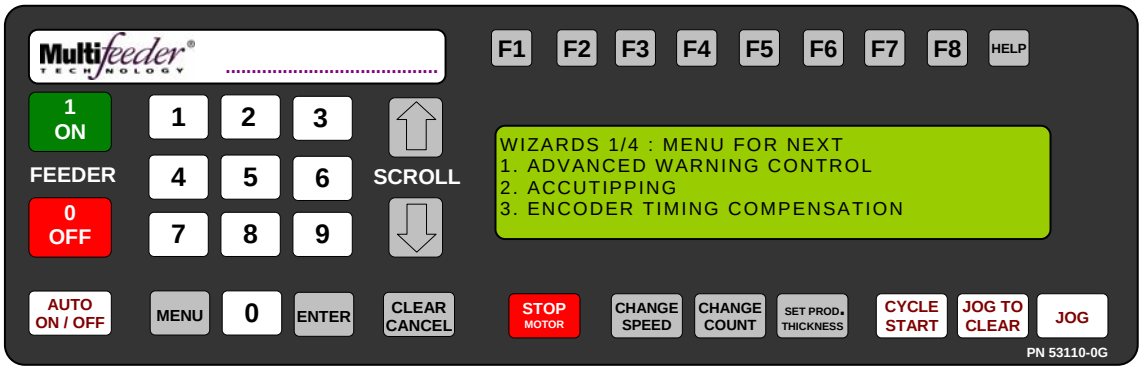


Technician Settings Screen 1 of 3 – Advanced Settings
Digital I/O Screen 3 of 3 – Invert Output
Invert Output 10

The *Invert Output 10* screen allows the operator to invert output 10 on the optional I/O Card.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2 | 3 | MENU X 9

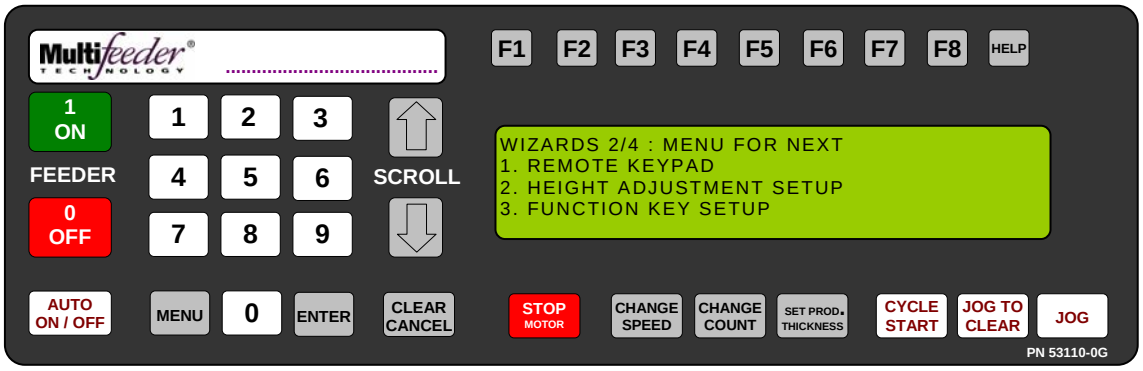


Technician Settings Screen 1 of 3 – Advanced Settings
Wizards 1 of 4

Please refer to the *Wizards Manual*.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 6

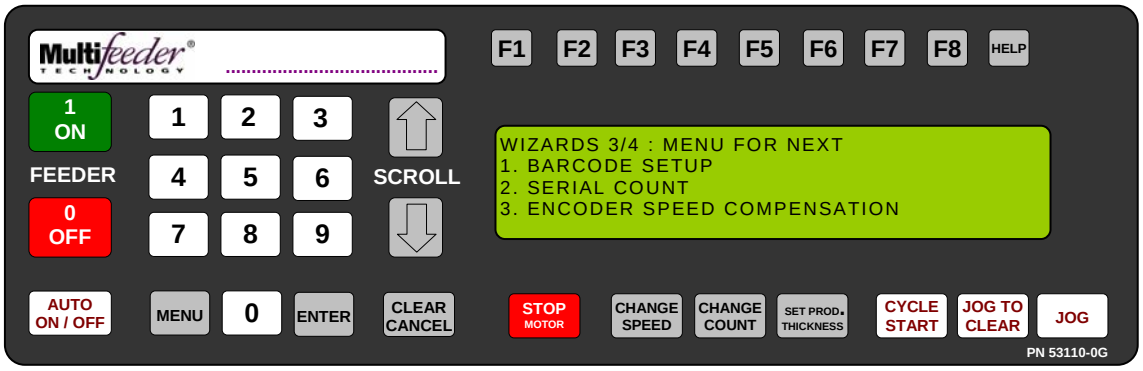


Technician Settings Screen 1 of 3 – Advanced Settings
Wizards 2 of 4

Please refer to the *Wizards Manual*.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 6 MENU

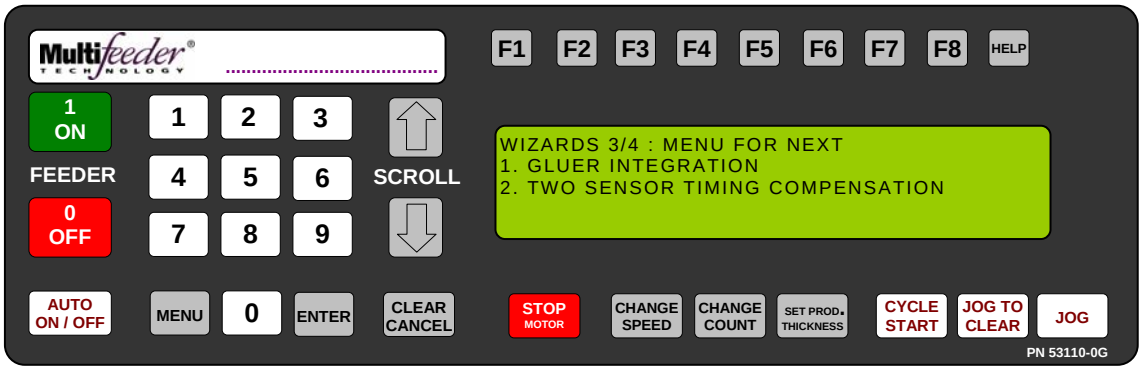


Technician Settings Screen 1 of 3 – Advanced Settings
Wizards 3 of 4

Please refer to the *Wizards Manual*.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | 5 | MENU X 2

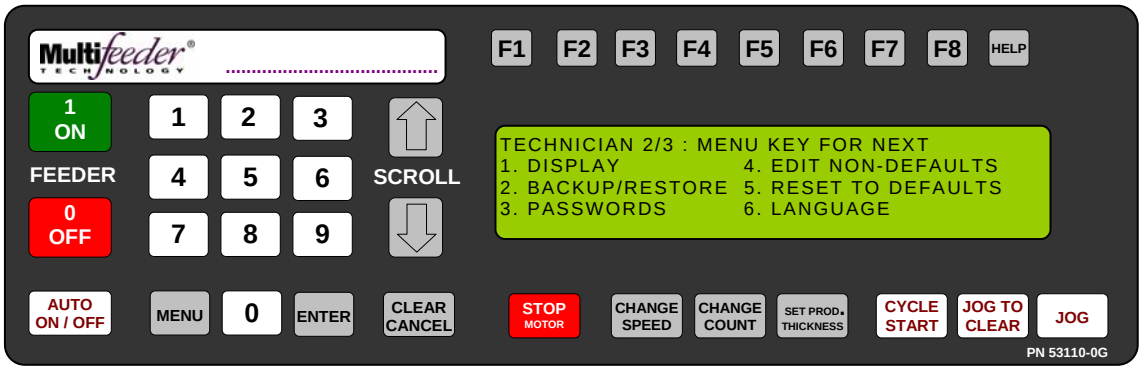


Technician Settings Screen 1 of 3 – Advanced Settings
Wizards 4 of 4

Please refer to the *Wizards Manual*.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

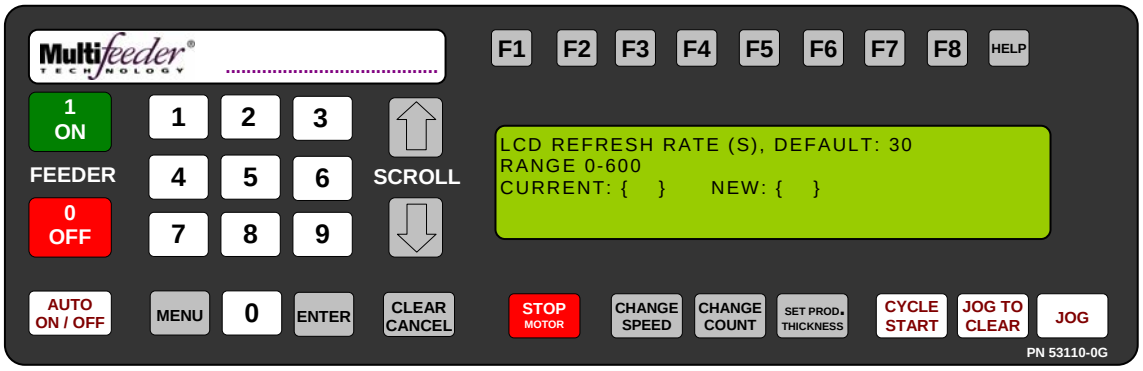
MENU X 2 | 2 | 5 | MENU X 3



Technician Settings Screen 2 of 3

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU

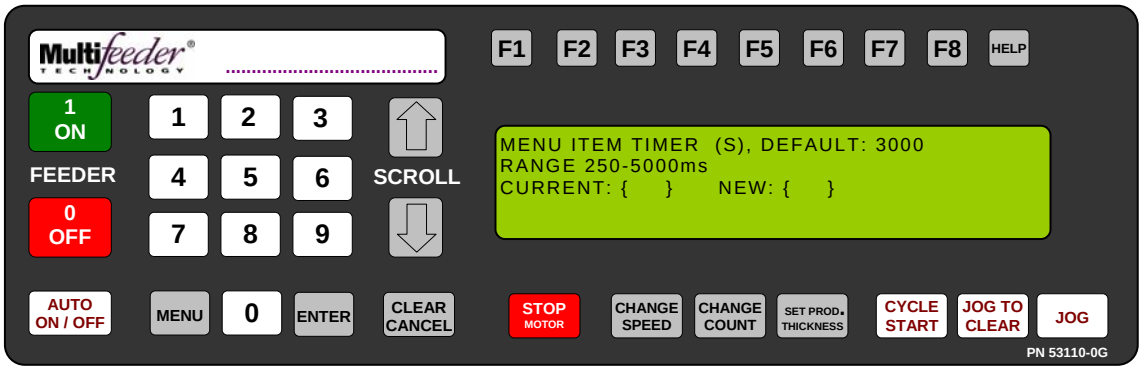


Technician Settings Screen 2 of 3 – Display Setting
LCD Refresh Rate

This setting allows the technician to change how often the LCD Display refreshes without intervention.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU | 1

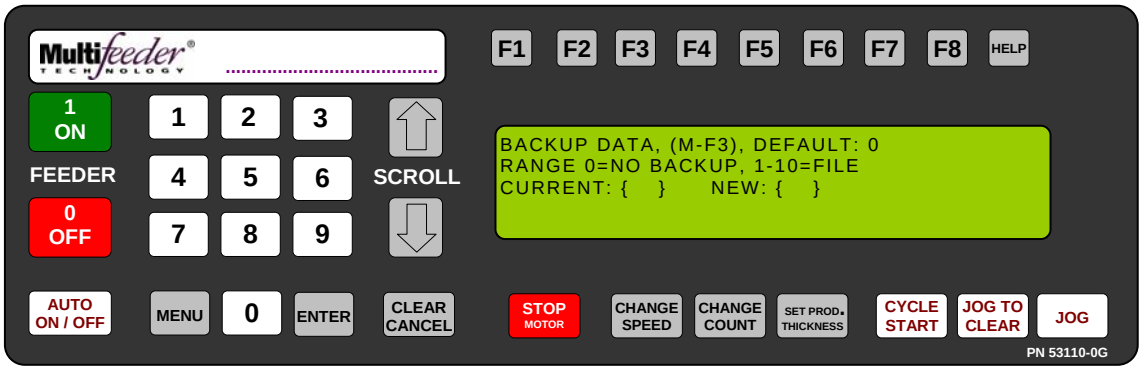


Technician Settings Screen 2 of 3 – Display Setting
Menu Item Timer

This is the length of time that display messages will be left on the screen before they timeout.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU | 1 | MENU

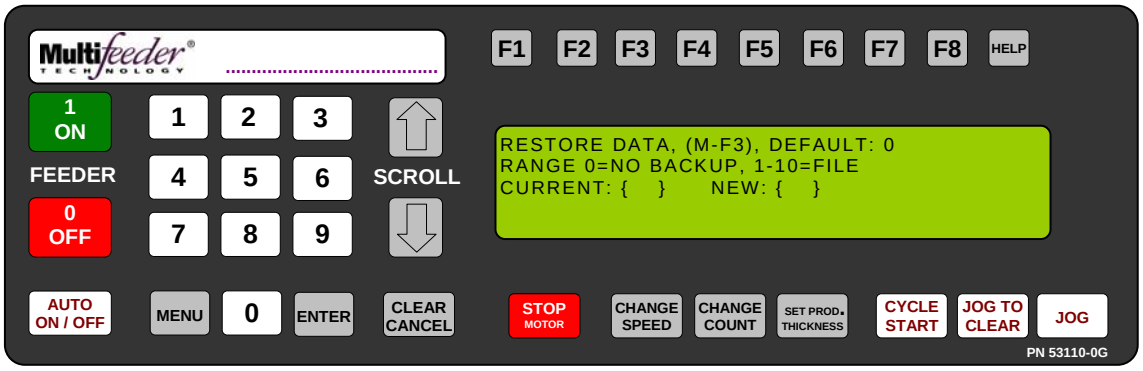


Technician Settings Screen 2 of 3 – Backup/Restore Setting
Backup Data Settings

This setting allows the technician to save the backup data.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU 2

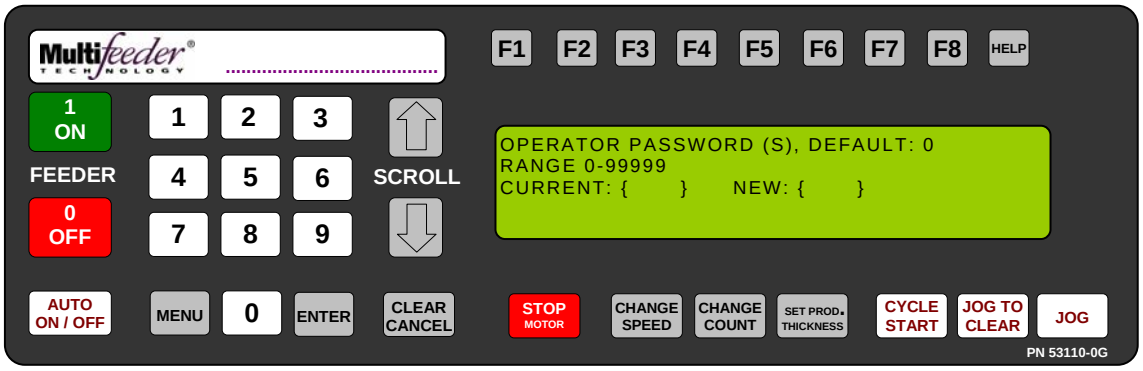


Technician Settings Screen 2 of 3 – Display Setting
Restore Data Settings

This setting allows the technician to restore the backup data.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU | 2 | MENU

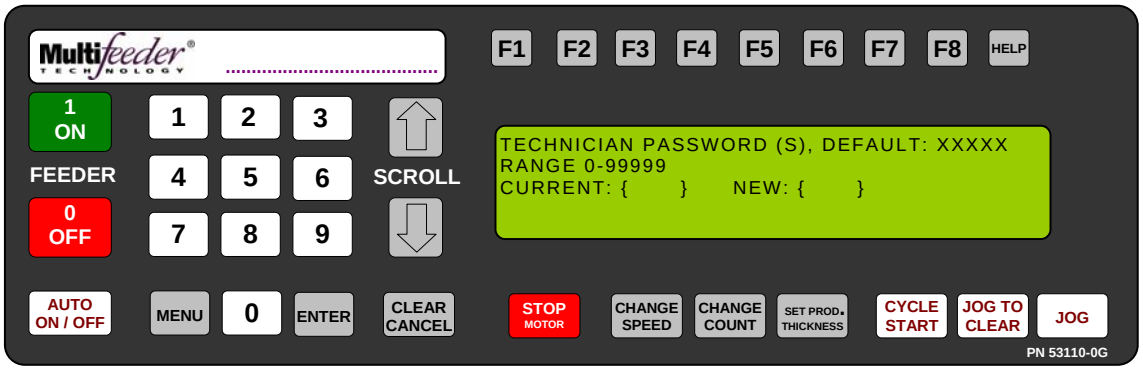


Technician Settings Screen 2 of 3 – Password Setting
Operator Password

This setting allows the technician to change the operator password.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU 3

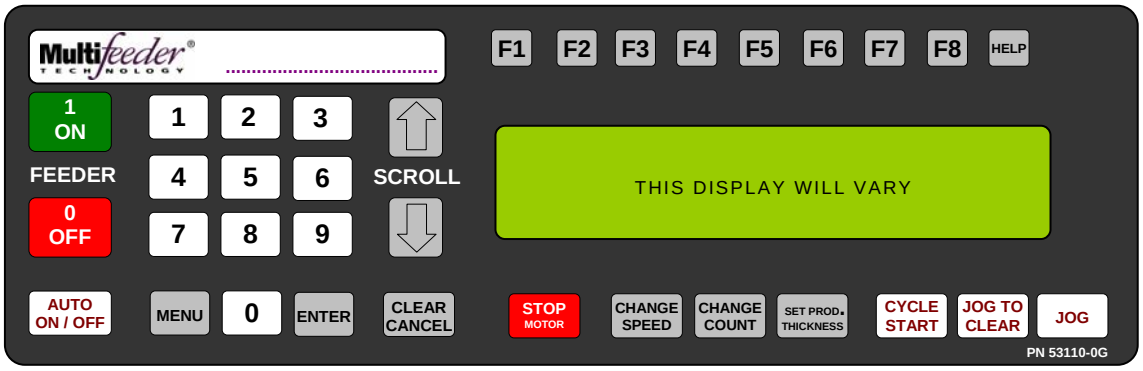


Technician Settings Screen 2 of 3 – Password Setting
Technician Password

This will reset the technician password for the system. Record the new password in a secure location prior to changing the password.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU 3 MENU

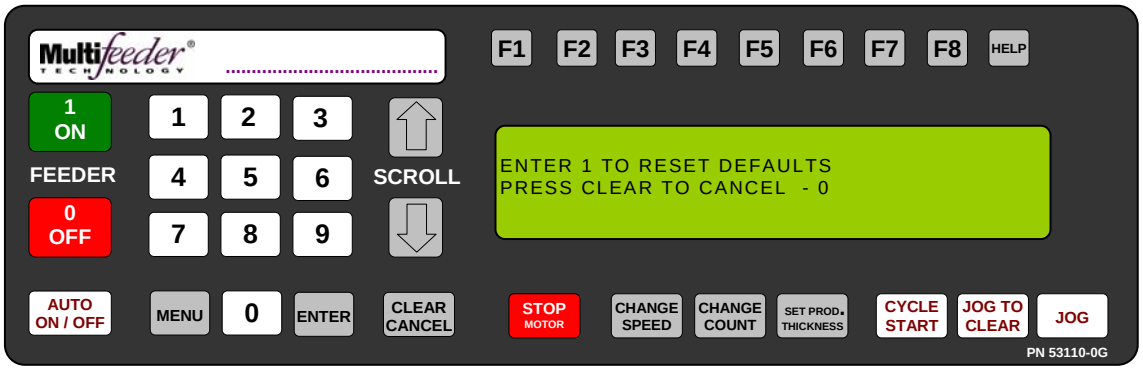


Technician Settings Screen 2 of 3 – Edit Non-Defaults Setting
Edit Non-Defaults Screen

The sub-menus in this setting are settings that have been changed from default. Screens displayed for this setting will differ to reflect your non-default settings.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU 3

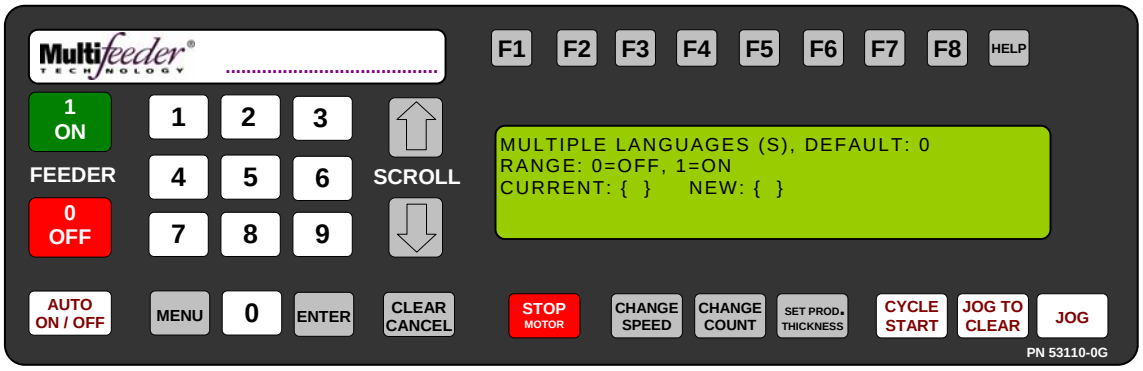


Technician Settings Screen 2 of 3 – Reset to Default Setting
Reset to Defaults

This setting allows the technician to set the machine settings to default.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU 5

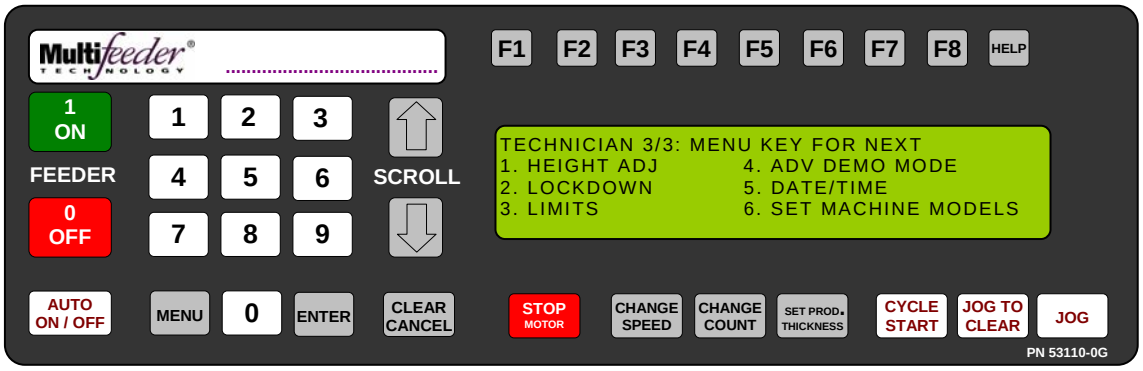


Technician Settings Screen 2 of 3 – Language Setting
Multiple Languages

This setting allows the technician to toggle the *Multiple Languages* feature on or off.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

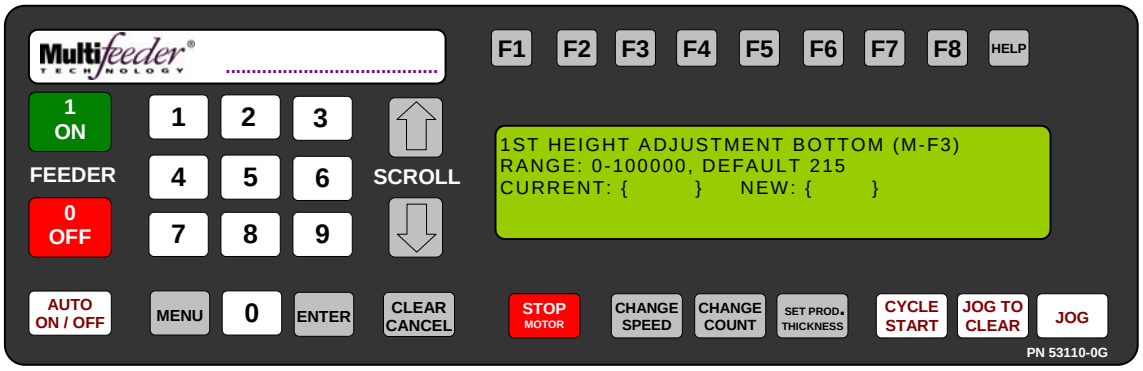
MENU X 2 | 2 | MENU | 6



Technician Settings Screen 3 of 3

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

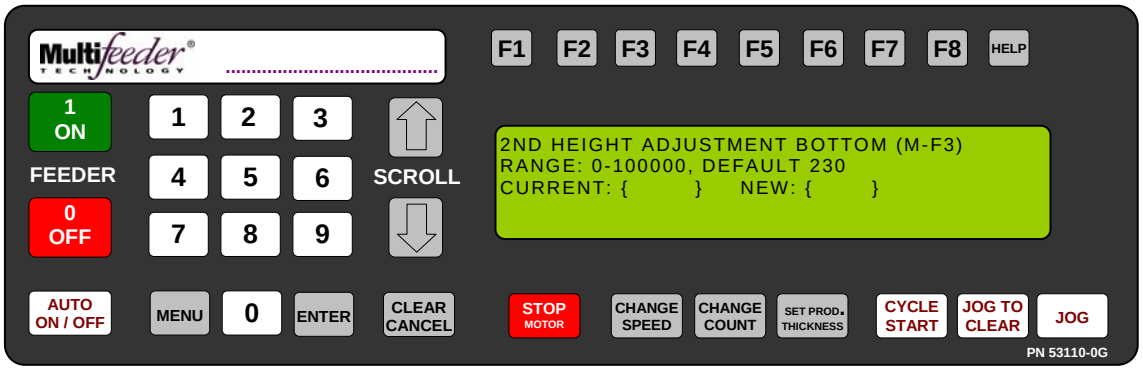
MENU X 2 | 2 | MENU X 2



Technician Settings Screen 3 of 3 - Height Adjustment Setting
1st Height Adjustment

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

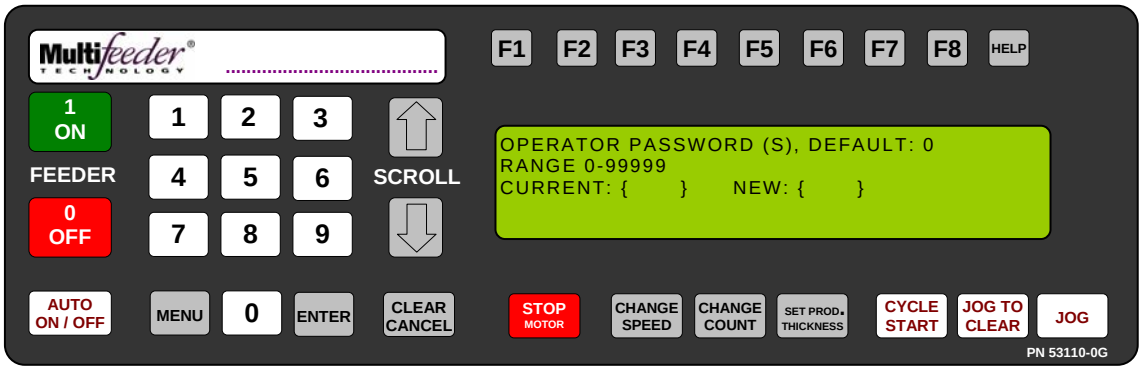
MENU X 2 | 2 | MENU X 2 | 1



Technician Settings Screen 3 of 3 - Height Adjustment Setting
2nd Height Adjustment

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU X 2 | 1 | MENU

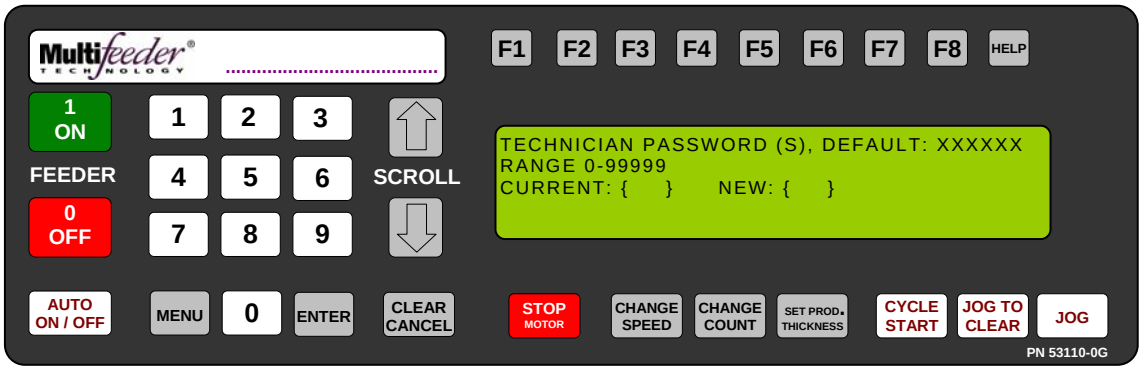


Technician Settings Screen 3 of 3 – Lockdown Setting
Operator Password

This will reset the operator password for the system.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

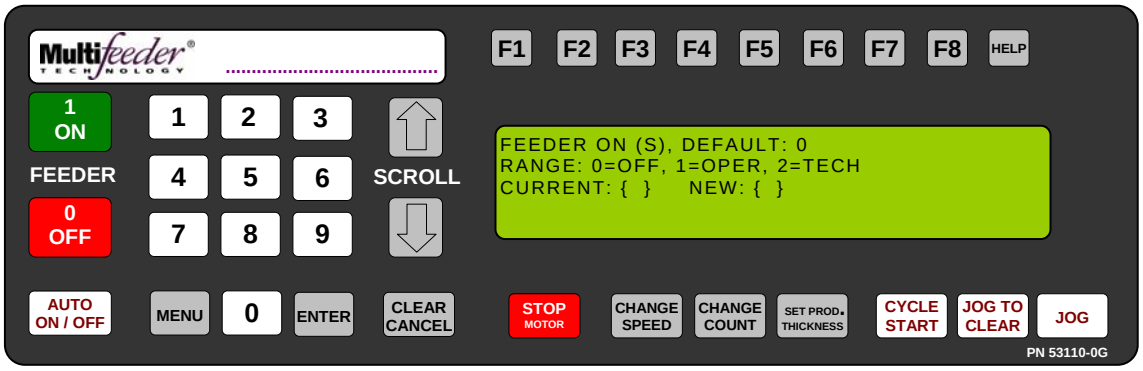
MENU X 2 2 MENU X 2 2



Technician Settings Screen 3 of 3 – Lockdown Setting
Technician Password

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU

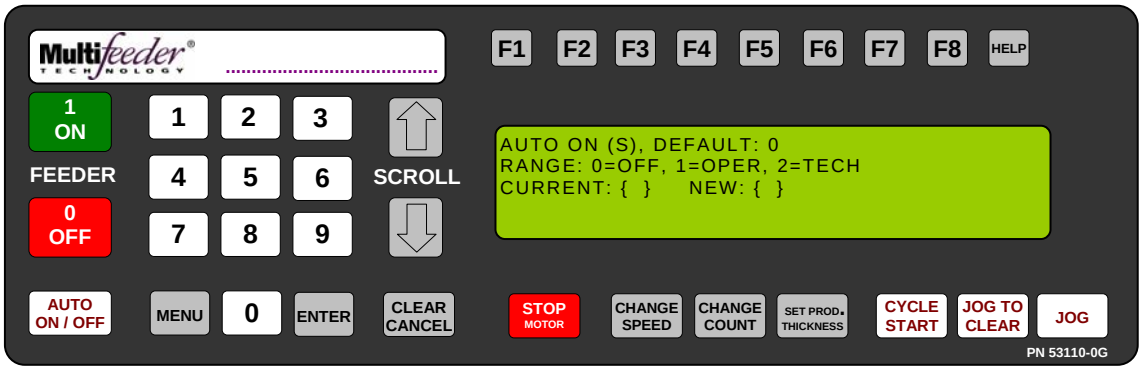


Technician Settings Screen 3 of 3 – Lockdown Setting
Feeder On

This setting allows the technician to set a password requirement for the *Feeder On* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X 2

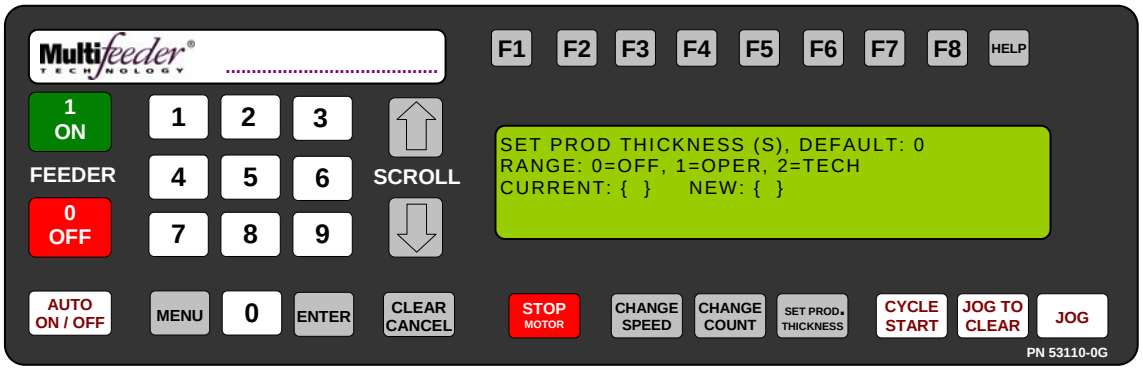


Technician Settings Screen 3 of 3 – Lockdown Setting
Auto On

This setting allows the technician to set a password requirement for the *Auto On* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X 3

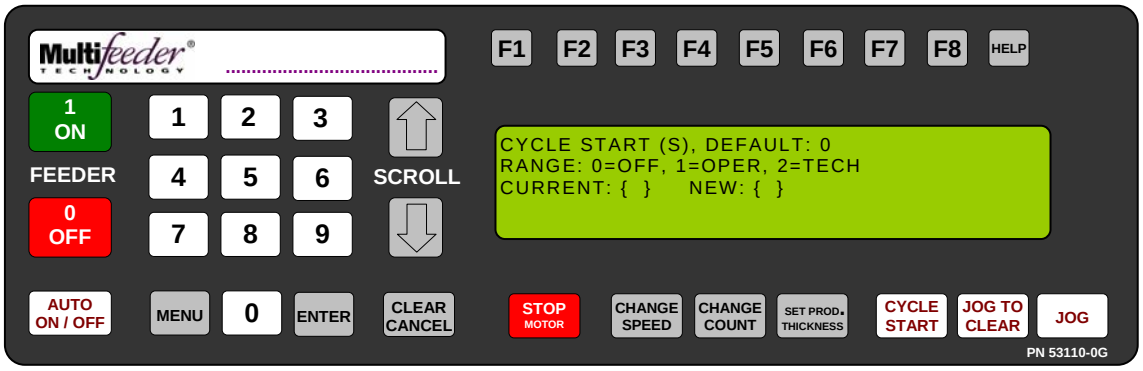


Technician Settings Screen 3 of 3 – Lockdown Setting
Set Product Thickness

This setting allows the technician to set a password requirement for the *Set Product Thickness* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X 4

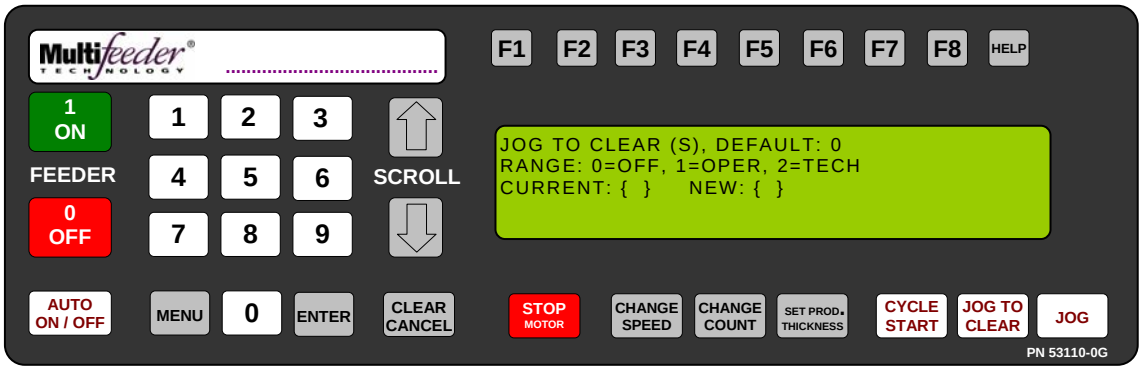


Technician Settings Screen 3 of 3 – Lockdown Setting
Cycle Start

This setting allows the technician to set a password requirement for the *Cycle Start* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X 5

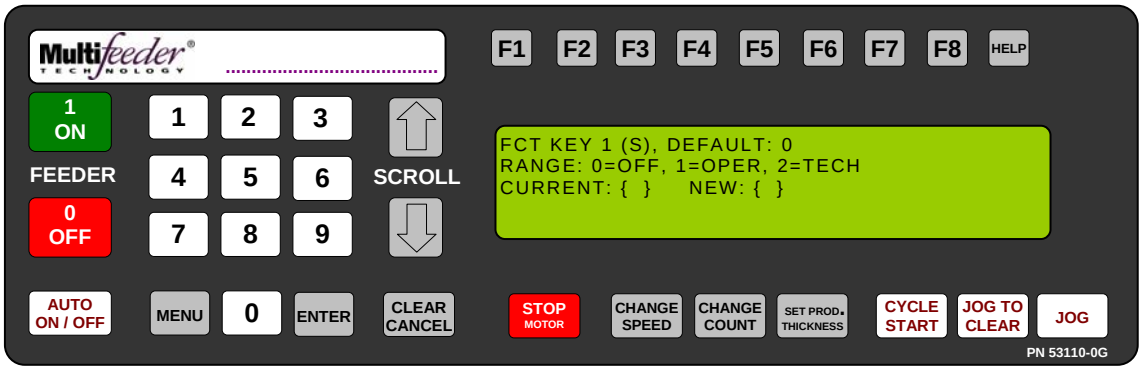


Technician Settings Screen 3 of 3 – Lockdown Setting
Jog To Clear

This setting allows the technician to set a password requirement for the *Jog To Clear* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X 6

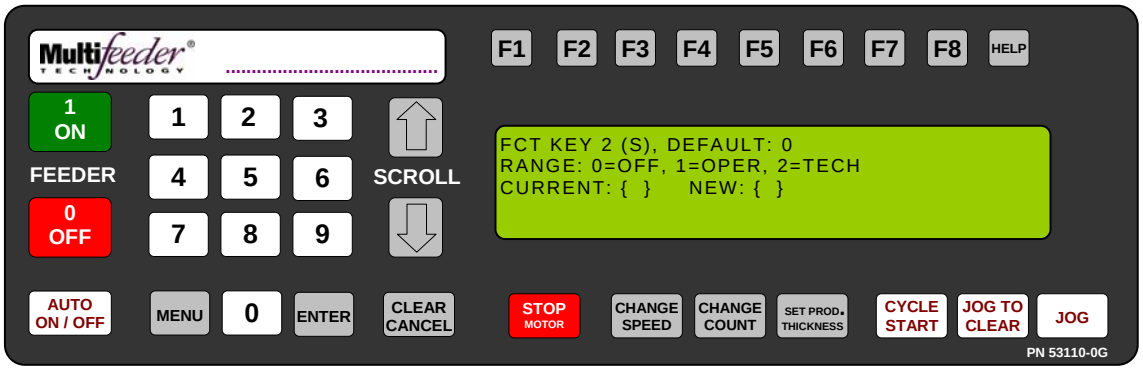


Technician Settings Screen 3 of 3 – Lockdown Setting
FCT Key 1

This setting allows the technician to set a password requirement for the *Function Key 1* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X 7

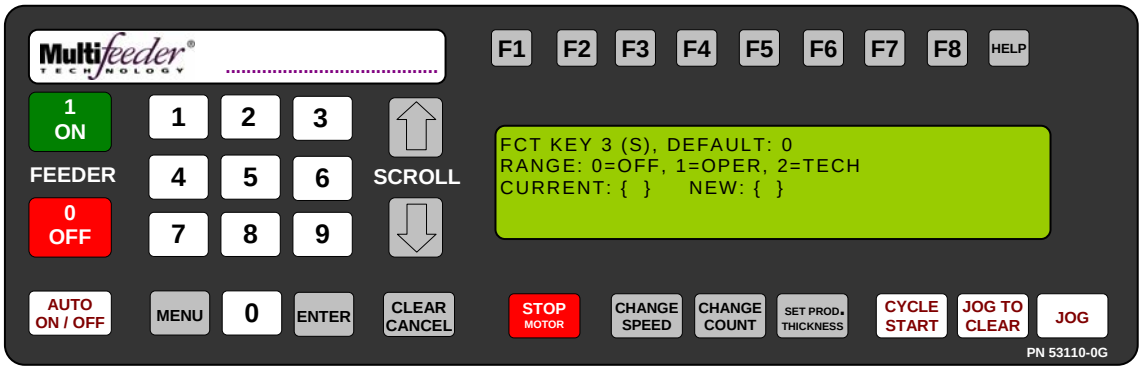


Technician Settings Screen 3 of 3 – Lockdown Setting
FCT Key 2

This setting allows the technician to set a password requirement for the *Function Key 2* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X 8

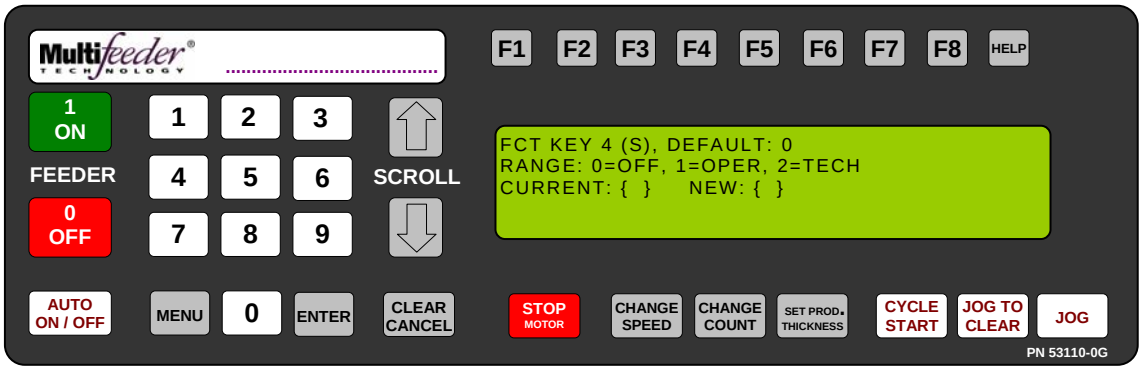


Technician Settings Screen 3 of 3 – Lockdown Setting
FCT Key 3

This setting allows the technician to set a password requirement for the *Function Key 3* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X 9

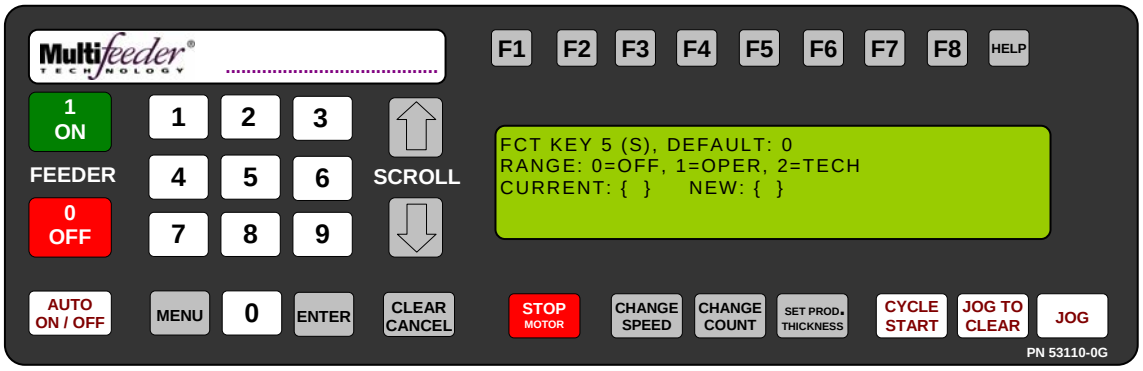


Technician Settings Screen 3 of 3 – Lockdown Setting
FCT Key 4

This setting allows the technician to set a password requirement for the *Function Key 4* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X10

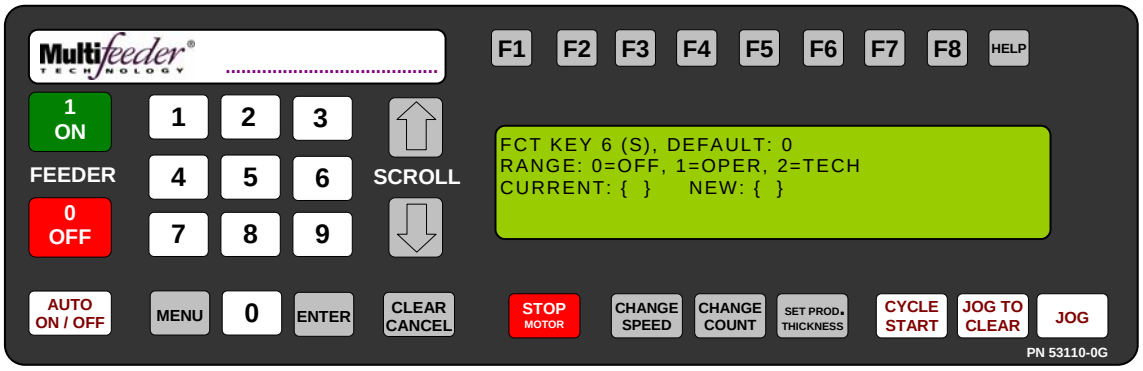


Technician Settings Screen 3 of 3 – Lockdown Setting
FCT Key 5

This setting allows the technician to set a password requirement for the *Function Key 5* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X11

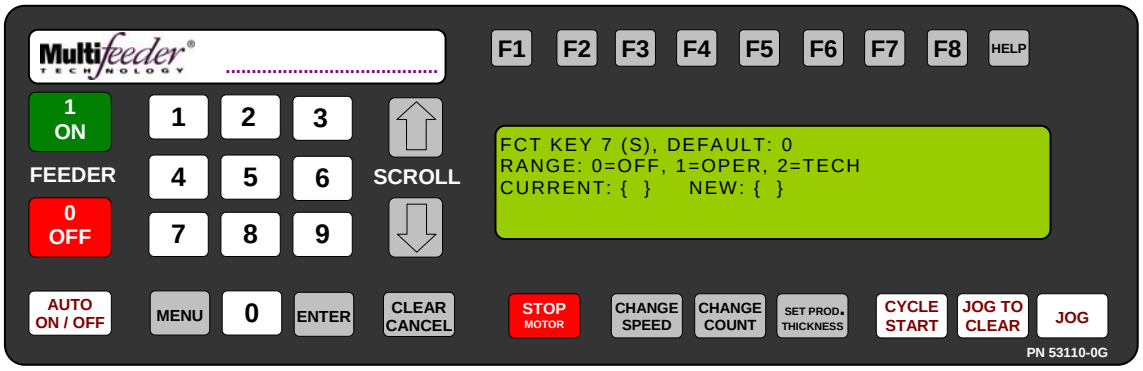


Technician Settings Screen 3 of 3 – Lockdown Setting
FCT Key 6

This setting allows the technician to set a password requirement for the *Function Key 6* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X12

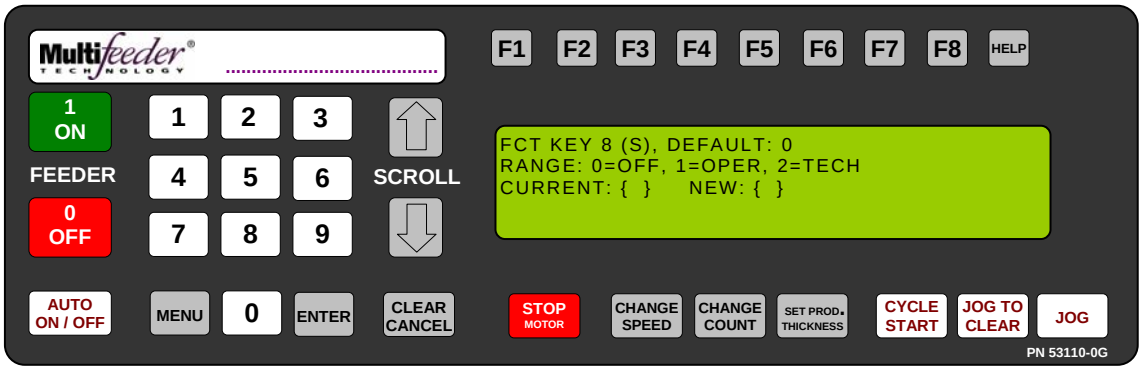


Technician Settings Screen 3 of 3 – Lockdown Setting
FCT Key 7

This setting allows the technician to set a password requirement for the *Function Key 7* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X13

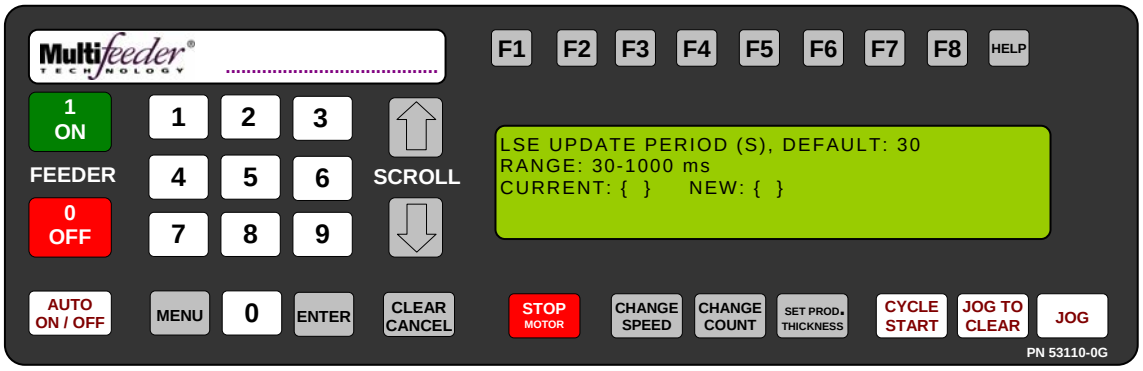


Technician Settings Screen 3 of 3 – Lockdown Setting
FCT Key 8

This setting allows the technician to set a password requirement for the *Function Key 8* button as well as the password level.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 2 MENU X14

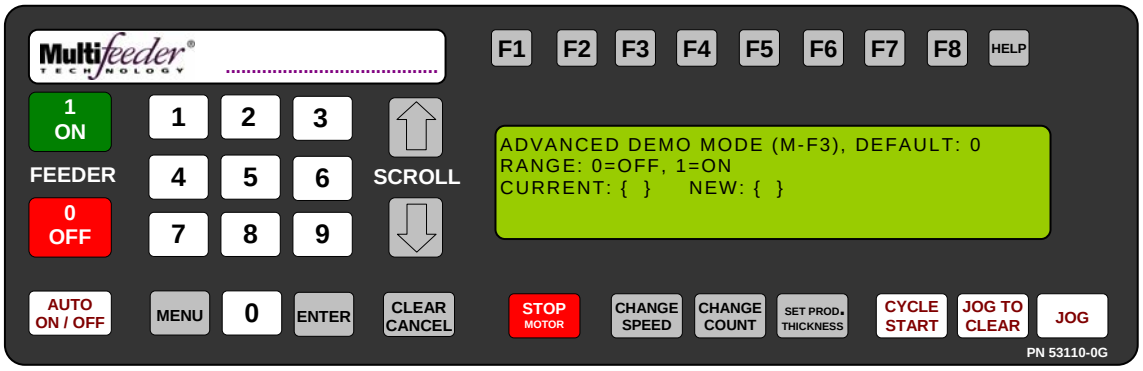


Technician Settings Screen 3 of 3 – Limits Setting
LSE Update Period

This setting allows the technician to set the *Line Speed Encoder (LSE)* update period.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU X 2 | 3

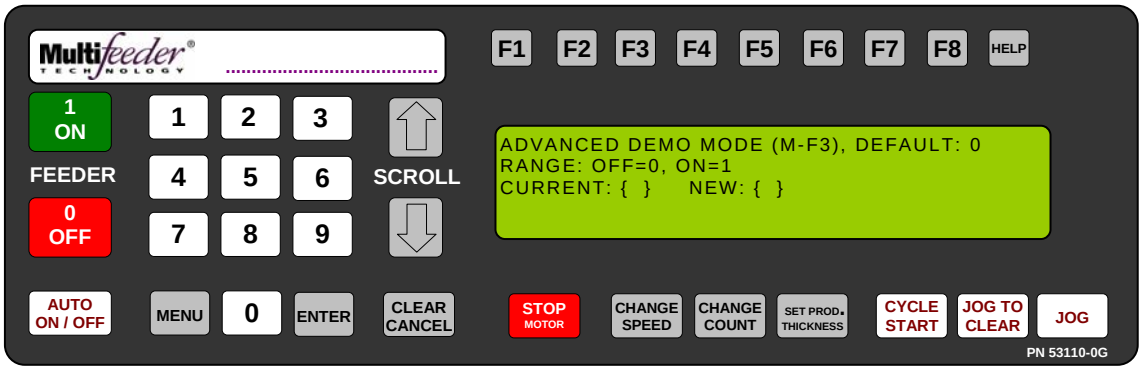


Technician Settings Screen 3 of 3 – Advanced Demo Mode Setting
Advanced Demo Mode

This setting allows the technician to set the operator to enable the *Advanced Demo Mode* feature.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 4

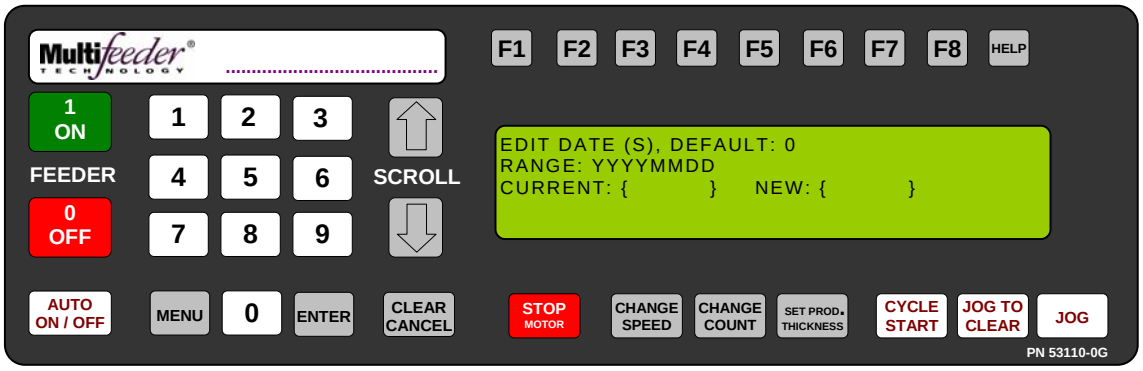


Technician Settings Screen 3 of 3 – Advanced Demo Mode Setting
Demo Mode Override

This setting allows the technician to set the operator to enable the *Demo Mode Override* feature.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU X 2 | 4 | MENU

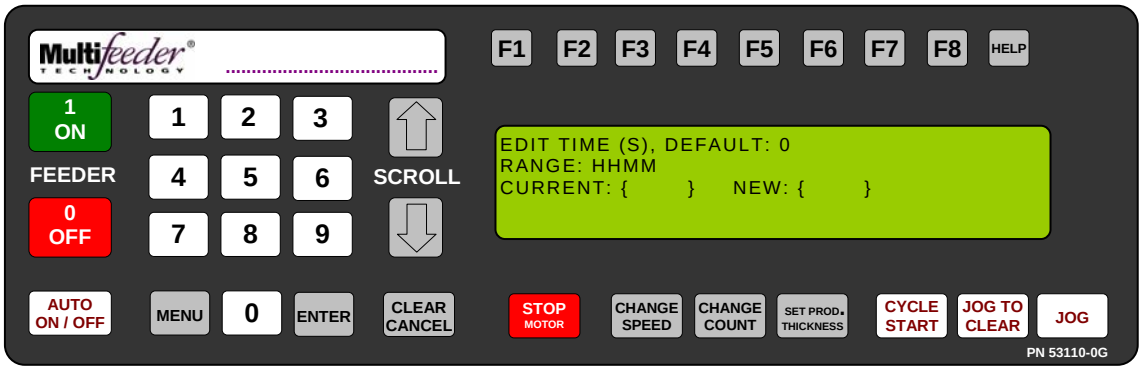


Technician Settings Screen 3 of 3 – Date/Time Setting
Edit Date Setting

This setting allows the technician to set the date.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU X 2 | 5

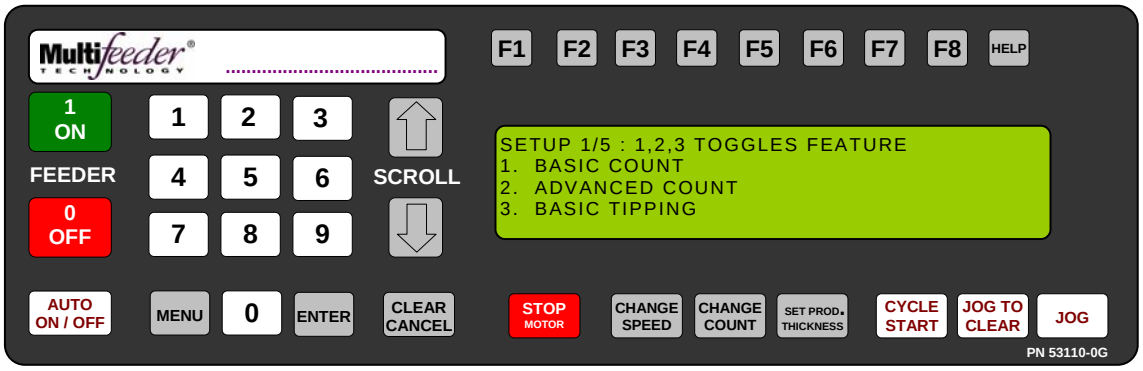


Technician Settings Screen 3 of 3 – Date/Time Setting
Edit Time Setting

This setting allows the technician to set the time.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

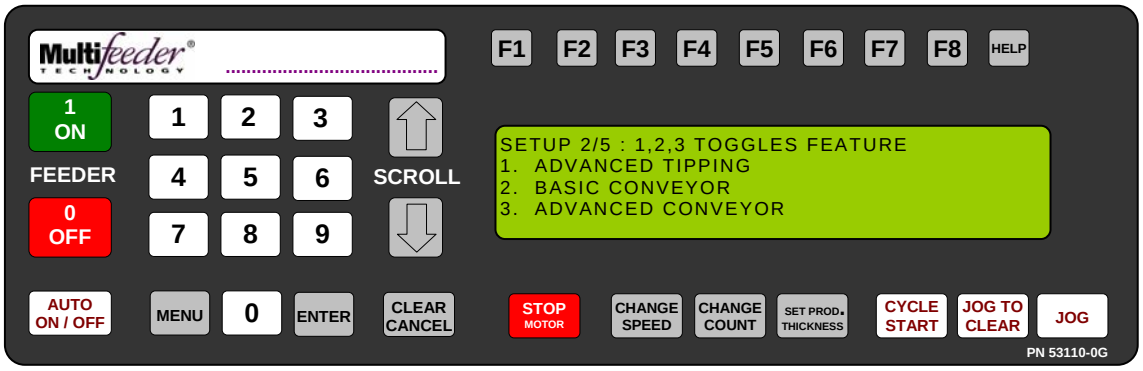
MENU X 2 | 2 | MENU X 2 | 5 | MENU



Technician Settings Screen 3 of 3 – Machine Modes
Machine Modes Setting 1 of 5

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 [ ] MENU X 2 6



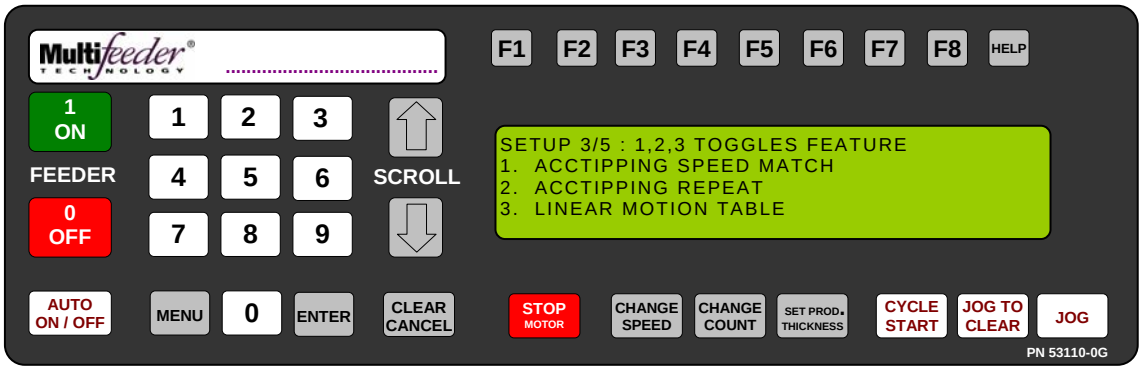
Technician Settings Screen 3 of 3 – Machine Modes
Machine Modes Setting 2 of 5

This setting allows the technician to set the Feeder's operating mode. The enabled mode will be denoted by an "X" next to it. Use the keypad to toggle the setting on or off.

Note : Some operating modes are optional and require a *"Key"* to enable.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 6 MENU



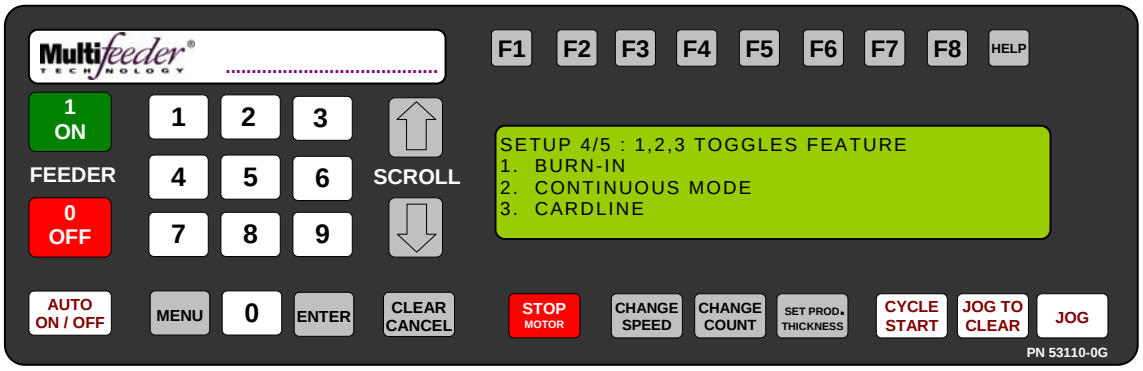
Technician Settings Screen 3 of 3 – Machine Modes
Machine Modes Setting 3 of 5

This setting allows the technician to set the Feeder's operating mode. The enabled mode will be denoted by an "X" next to it. Use the keypad to toggle the setting on or off.

Note : Some operating modes are optional and require a *"Key"* to enable.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU X 2 | 6 | MENU X 2



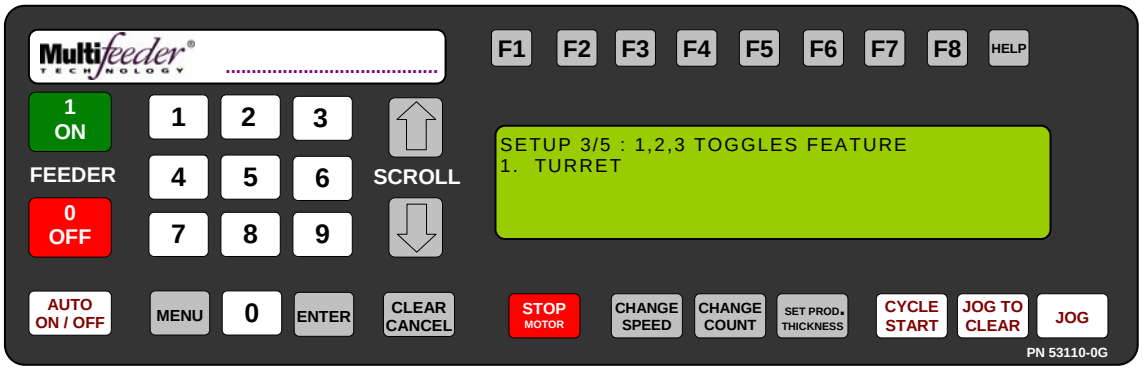
Technician Settings Screen 3 of 3 – Machine Modes
Machine Modes Setting 4 of 5

This setting allows the technician to set the Feeder's operating mode. The enabled mode will be denoted by an "X" next to it. Use the keypad to toggle the setting on or off.

Note : Some operating modes are optional and require a *"Key"* to enable.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 | 2 | MENU X 2 | 6 | MENU X 3



Technician Settings Screen 3 of 3 – Machine Modes
Machine Modes Setting 5 of 5

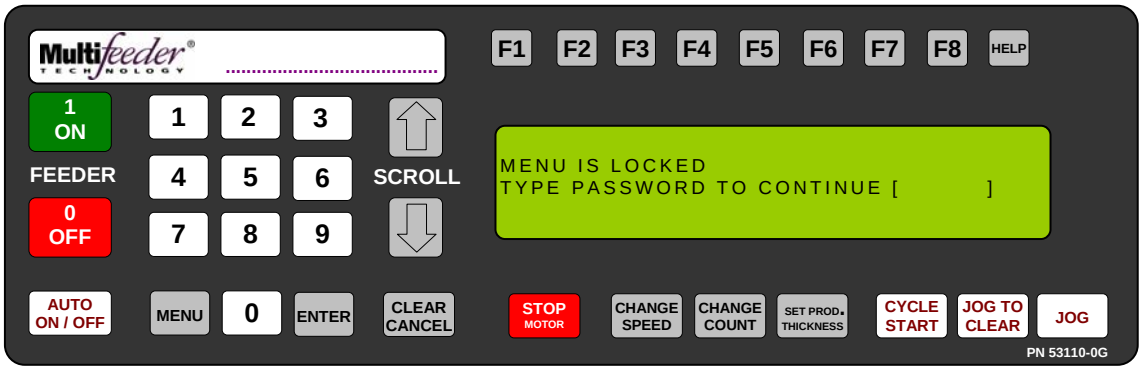
This setting allows the technician to set the Feeder's operating mode. The enabled mode will be denoted by an "X" next to it. Use the keypad to toggle the setting on or off.

Note : Some operating modes are optional and require a *"Key"* to enable.

Press the button sequence below from the *Ready Screen* to access this screen.
Note: You may be required to enter a password.

MENU X 2 2 MENU X 2 6 MENU X 4

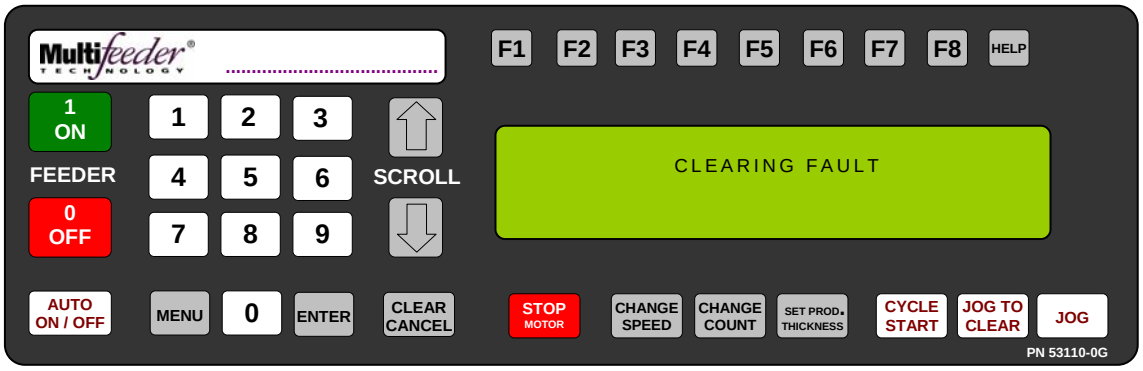
Password and Warning Screens



Password Screen

The *Password Screen* is displayed whenever a password is required for to access a menu.

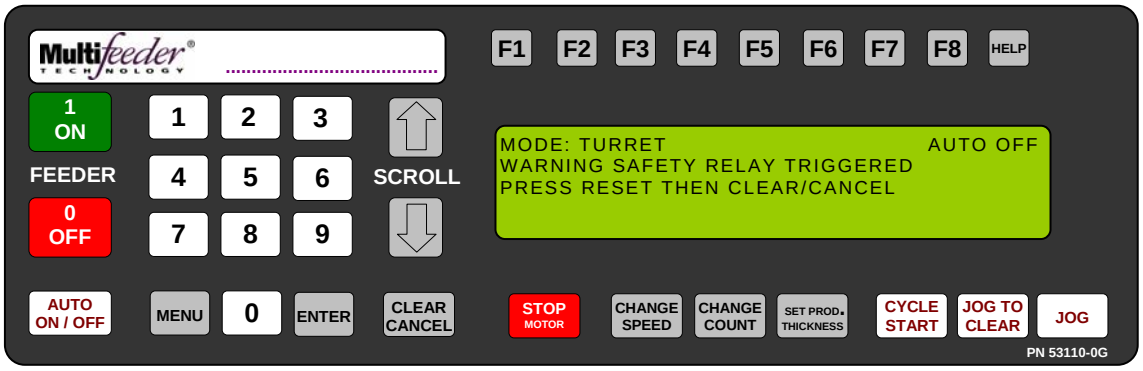
This screen is prompted and not directly accessed.



Clearing Fault Screen

The *Clearing Fault Screen* is displayed whenever the CLEAR/CANCEL button is pressed.

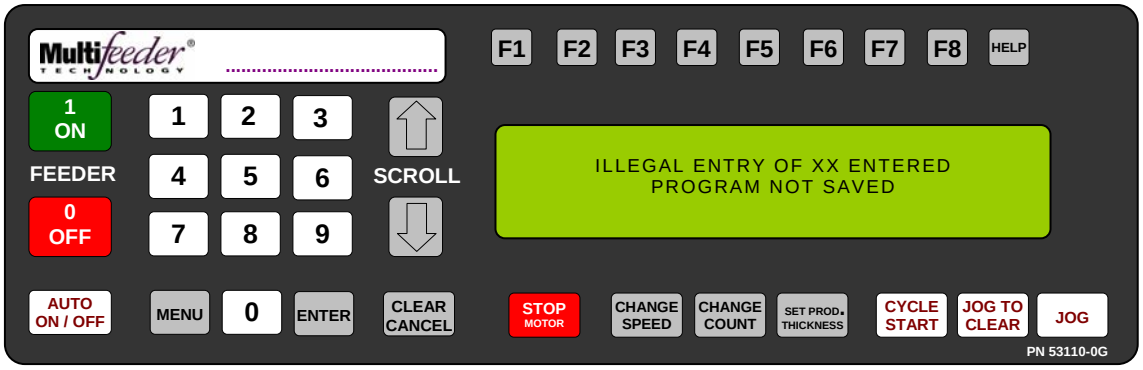
This screen is prompted and not directly accessed.



Safety Relay Tripped Warning Screen

The *Safety Relay Tripped Warning Screen* is displayed whenever a safety relay is triggered.

This screen is prompted and not directly accessed.



Illegal Entry Warning Screen

The *Illegal Entry Warning Screen* is displayed whenever an out of range value is entered. The above example is when an out of range program value is used.

This screen is prompted and not directly accessed.

APPENDIX

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APPENDIX

Electrical Schematics

Overview

The internal and external electrical connections are summarized in **Error! Reference source not found.**. Table 0-1 gives brief descriptions of the listings shown in **Error! Reference source not found.**. A comprehensive summary covering both internal and external connections follows.

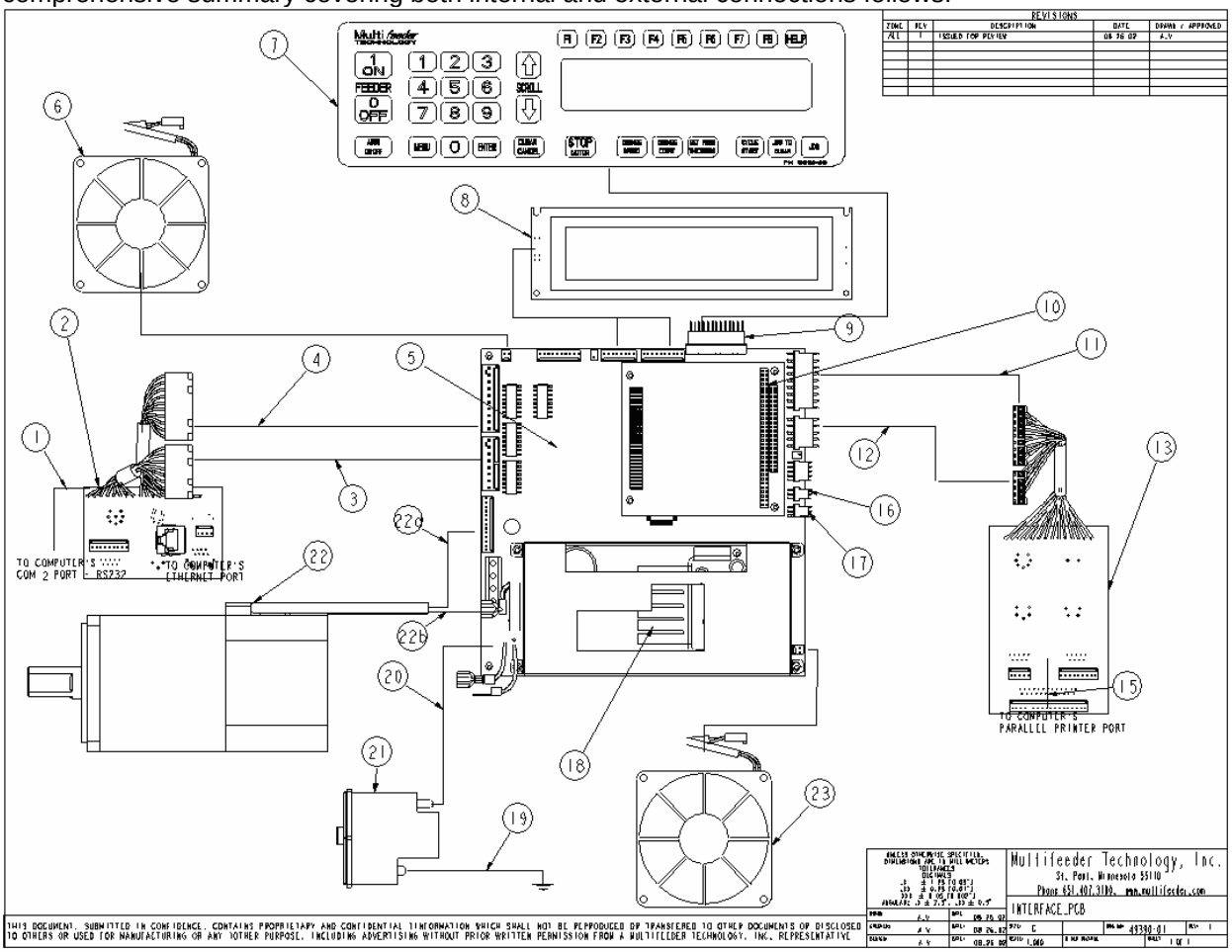


Figure 0-1 Internal and External Connections

APPENDIX

Location	Name	Part Number	Description
1	RS232 Communication IP Cable	70071-00	This cable connects the computer board to the RS232 COM2 connector.
2	Conn PCB Feeder Rear	70483-02	Printed circuit board located at the rear of the *Feeder* containing J1, J2, J3, J4, and J26A.
3	APL Interface Connections	-	This cable assembly connects the rear *Feeder* PCB (70483-02) to the Motherboard at P10. Contains the status signal for J2.
4	Start/Status and Low Product Sensor Connection	-	This cable assembly connects the rear *Feeder* PCB (70483-02) to the Motherboard at P9. Contains the status signal for J1 and J3.
5	IP Motherboard Assembly Board	82202-0E	
6	Fan 1	70187-00	This fan connects to the Motherboard at P11.
7	Membrane Keyboard	53110-0D	This keyboard connects to the Motherboard at P6.
8	LCD IP Assembly	70018-00	This assembly consists of the LCD display (55024-00) and a 16-pin connector (50425-00), and connects to the Motherboard at P3 and P4.
9	13-Pin Flex Cable	53120-00	This cable connects the Motherboard to the keyboard at P6.
10	Computer Board	70315-00	
11	Traffic Light Connection	-	This cable assembly connects the front *Feeder* PCB (70485-02) to the Motherboard at P12. Contains the status signals for J22.
12	Product Sensor Connection	-	This cable assembly connects the front *Feeder* PCB (70485-02) to the Motherboard at P13. Contains the status signals for J6.
13	Conn PCB Feeder Front	70485-02	Printed circuit board located at the front of the *Feeder* containing J6, J7, J22, J23, J24 and J25.
14	N/A	N/A	N/A
15	Parallel Printer Connector Cable	70085-00	This cable connects the computer utility on the WinSystems to the RS232 and parallel printer connections.
16	Slide Potentiometer Assembly	82121-01 (Left)	This assembly connects to the upper exit shaft linear potentiometer to the Motherboard at P18.
17	Slide Potentiometer Assembly	82121-01 (Right)	This assembly connects to the stripper wheel shaft linear potentiometer to the Motherboard at P17.
18	Power Supply IP	55017-00	The Power Supply connects to the Motherboard at P20 (AC power supply output) and P19 (Low voltage power supply).
19	Ground	-	-
20	Power Entry Module - AC Power Supply	81610-00	The power entry module connects to the Motherboard at P16 (AC power supply input).
21	Power Entry Module	81610-00	-
22	Motor	-	-
22a	N/A		
22b	Motor Leads		The motor leads connect to the Motherboard at P14
23	Fan 2	70187-00	This fan connects to the Motherboard at P15.

Table 0-1 Overview Descriptions

External Connections

Jack 1 - Start/Status

Jack 1, the Start/Status connector, is located on the Feeder Rear PCB (70483-02). This connector provides status information to connecting equipment, and receives a start signal for the *Feeder* machine. See Table 0-2 for further information on this connector. A detailed description of each pin follows.

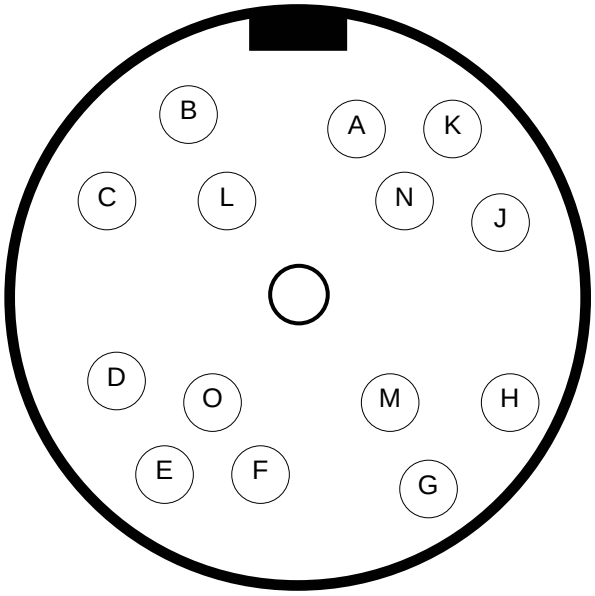
Jack Number	***Cable Description***	***Pin Number (Color)***	***Signal Name***	***Signal Description***
J1	Start/Status	A (Brown)	+24 VF	+24 V from Feeder
		B (Tan)	PSTART	Start Pulse, 24V (10-30V), 5ms (1-100ms)
		C (Pink)	LOW PROD	Low Product
		D (Orange)	AUTO ON/OFF	Auto On/Off
		E (Violet)	J1-E	J1-E Output
		F (Blue)	CC	Cycle Complete
		G (Green)	C3	Status Select
		H (Yellow)	R	Red Lamp (Fault)
		J (Gray)	RDY	Ready
		K (Red)	APL	Automatic Product Loader
		L (White)	DD STATUS	APL Status
		M (Black)	GND24	Ground
		N (Black)	GND24	Ground
		O (Black)	GND24	Ground

Table 0-2 J1-Start/Status

Pin A (+24VF) may be used in the following ways:

- *As a power source for a sensor*. When using a PNP or sourcing sensor, connect the positive terminal to Pin A (24 Volt), the negative terminal to Pin M (Ground), and the output to Pin B (PSTART). Please note that since a positive signal voltage is required, only a PNP sensor will work.
- *As a voltage to supply the PSTART*. A relay can be used to create a closed contact between the 24 Volt supply and the PSTART to provide the *Feeder* with a start signal. Connect one leg of the relay output to Pin A (24 Volt), and one leg to Pin B (PSTART).
- *Other*. Other uses are not recommended without first consulting Multifeeder Technology.

Pin B (PSTART) is the start signal for the *Feeder* . A start is equal to 10-30V DC. This signal may be connected to the 12V or 24V output of a PLC. The *Feeder* starts when the signal goes from low to high.

Pin C (LOW PROD) is an output that is normally low (0 VDC) and goes high (24 VDC) when a low product condition has been detected.

Pin D (AUTO ON/OFF) is an output that is normally low (0 VDC) and goes high (24 VDC) when the *Feeder* is in the AUTO ON condition.

Pin E (J1-E) is a Configurable output that is 24 VDC.

Pin F (CC) is the Cycle Complete signal. This signal is very useful in intermittent motion applications, as it can be used to determine the current status of the *Feeder* . The host machine can provide a start signal to the *Feeder* and wait for the Cycle Complete signal to go to 0V DC (low) before indexing. If a fault occurs, the host machine will not index until the fault has been cleared and the signal is low. The Cycle Complete signal behaves in the following way:

- When the *Feeder* is in a ready condition but not feeding, the Cycle Complete signal is low (0V DC).
- When the *Feeder* is busy and/or in a fault condition, the Cycle Complete signal is high (24V DC).
- If the *Feeder* is in the Auto Off condition, the Cycle Complete signal is high (24V DC). The Cycle Complete signal may be inverted by selecting Option 3 in Menu 4 (Interface Signal Menu). See Section for more information.

Pin G (C3) is the Status Select signal. This signal is used by the *Feeder* to determine the status of the Automatic Product Loader or Automatic Drop Table, if present. Do not connect anything to this signal at any time.

Pin H (R) is the Red, or Fault signal and acts in the following way:

- When the *Feeder* is in a green condition (Ready), the signal is low (0V DC). When the *Feeder* is in a red condition (Feeder Fault or Not Ready), the signal is high (24V DC).

Pin J (RDY) is the Ready signal and acts in the following way:

- High unless either *MPD I/O Ready* or *Jam I/O Ready* feature are enabled and either an MPD or Jam occurs (depending on which is enabled), it then goes low until next feed cycle is started.

Pin K (APL) is the APL Enable/Disable signal and is used to enable or disable the Automatic Product Loader or Drop Table, if present. The signal acts in the following way:

- When the *Feeder* is in a green condition (Ready), the signal is high.
- When the *Feeder* is in a red condition (Feeder Fault or Not Ready), the signal is low.

Pin L (DD Status) is the APL Status signal. This signal is used to communicate the status of the Automatic Product Loader or Automatic Drop Table, if present, back to the *Feeder* . Status readings include Present, Not Present, Ready, and Not Ready.

Pin M, N and O (Ground) is the reference for all of the above signals. When connecting any of the above signals, Pins M, N and O (Ground) must also be connected to the host machine ground.

Jack 2 APL Interface

Jack 2, the APL Interface connector, is located on the Feeder Rear PCB (70483-02). This connector is used to transmit information between the *Feeder* and the Automatic Product Loader. See Table 0-3 for further information on this connector. A detailed description of each pin follows.

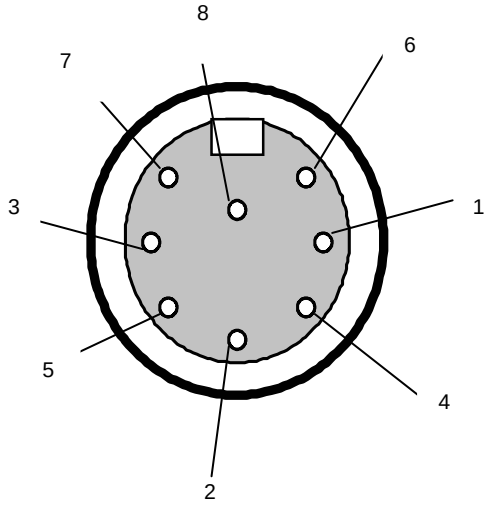
Jack Number	*Cable Description*	*Pin Number (Color)*	*Signal Name*	*Signal Description*
J2	APL Interface	1 (Black)	C3	Status Select
		2 (Green)	APL	Automatic Product Loader (Enable/Disable)
		3 (White)	APL Status	APL Status
		4 (Red)	Status GND	Ground
		5 (Brown)	GND24	APL Present Ground
		6 (Blue)	+24VF	+24 Volts from Feeder
		7 (Orange)	+24V APL	+24 V from APL
		8	OPEN	Open

Table 0-3 J2-APL Interface

Pin 1 (C3) is the Status Select signal. This signal determines the status of the Automatic Product Loader or Drop Table, if present.

Pin 2 (APL) is the APL Enable/Disable signal. It enables or disables the Automatic Product Loader or Drop Table, if present. The signal acts in the following way:

- When the *Feeder* is in a green condition (Ready), the signal is high (24V DC).
- When the *Feeder* is in a red condition (Feeder Fault or Not Ready), the signal is low (0V DC).

Pin 3 (APL Status) is the APL Status signal. This signal communicates the status of the Automatic Product Loader or Drop Table, if present, to the *Feeder* .

Pin 4 (Ground) is the reference for all of the above signals. When connecting any of the above signals, Pin 4 must also be connected to the host machine ground

Pin 5. (APL Present Ground) is the APL Status Ground signal and is used by the *Feeder* as a reference to the APL Status signal.

Pin 6 (24V Input from Feeder) is utilized by the APL to determine the status.

Pin 7 (24V APL) is the APL 24 Volt supply. It can be jumpered to Pins 2 and 6 to run the APL alone without a *Feeder* present.

Jack 3 - the Low Product

Jack 3, the Low Product connector, is located on Feeder Rear PCB (70483-02). This connects a photo optic sensor that triggers the yellow light in the onboard signal light. This photo optic sensor is configured to monitor the level of products in the magazine, and causes the yellow light to start flashing when the product level is low. See Table 0-4 for further information on this connector.

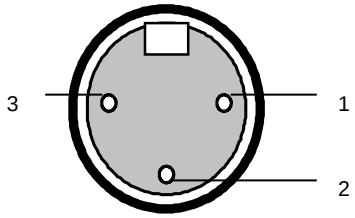
Jack Number	*Cable Description*	*Pin Number (Color)*	*Signal Name*	*Signal Description*
J3	Low Product	1 (Black)	+24 VF	+24 V from Feeder
		2 (Green)	Low Product	Low Product, 1=Low
		3 (Red)	GND24	Ground

Table 0-4 J3-Low Product

Jack 4 - RS 232 (COM 1)

Jack 4, the RS 232 connector, is located on the Feeder Rear PCB (70483-02). This connector is the means of serial data communication between the *Feeder* 's computer and other equipment. See Table 0-5 for further information on this connector.

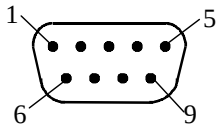
Jack Number	***Cable Description***	***Pin Number***	***Signal Name***
J4	RS 232	1	DCD - Data Carrier Detect
 J4 Front View		2	RX – Receive Data
		3	TX – Transmit Data
		4	DTR - Data Terminal Ready
		5	Ground
		6	DSR - Data Set Ready
		7	RTS - Request To Set
		8	CTS - Clear To Send
		9	Ring Indicator

Table 0-5 J4 - RS 232

Jack 5 - Power Entry

Jack 5, the power entry connector, is located on the Feeder Rear PCB (70483-02). This connector is the means of connecting power to the MFT friction *Feeder* . See Table 0-6 for further information on this connector.

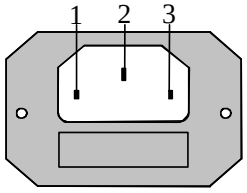
Jack Number	***Cable Description***	***Pin Number***	***Signal Name***
J5	Power Entry	1	120 VAC
 J5 Front View		2	Earth Ground
		3	Neutral

Table 0-6 J5-Power Entry

Jack 6 - Product Sensor

Jack 6, the product sensor connector, is located on the Feeder Front PCB (70485-02). This connects the product sensor, and the emitter and receiver pair to the MFT friction *Feeder* . See Table **0-7** for further information on this connector.

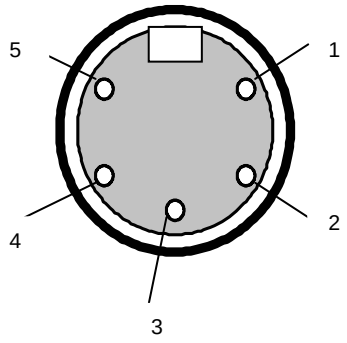
Jack Number	*Cable Description*	*Pin Number*	*Signal Name*	*Signal Description*
J6	Product Sensor	1	Emitter Drive	Emitter Cathode (Tab)
		2	+5VF	+5 V from Feeder Emitter Anode
		3	+5VF	+5V from Feeder Receiver Cathode
		4	Detector	Receiver Anode (Tab)
		5	Open	Ground

Table 0-7 J6-Product Sensors

Jack 22 – Signal Light

Jack 22, the signal light, is located on the Feeder Front PCB (70485-02). This connects the signal light to the MFT friction *Feeder* . See Table 0-7 for further information on this connector.

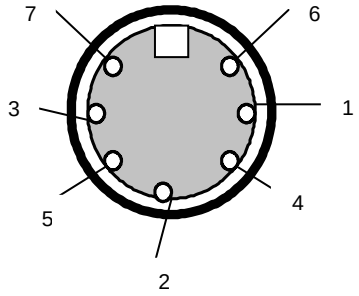
Jack Number	*Cable Description*	*Pin Number (Wire Color)*	*Signal Description*
J22	Signal Light	6 (Red)	Red Lamp (24V)
		2 (White/Yellow)	Yellow Lamp (24V)
		4 (Green)	Green Lamp (24V)
		1 (Black)	GND

Table 0-8 J22-Signal Light

Jack 23 - Line Speed Encoder

Jack 23, line speed encoder, is located on the Feeder Front PCB (70485-02). See Table 0-9 for further information on this connector.

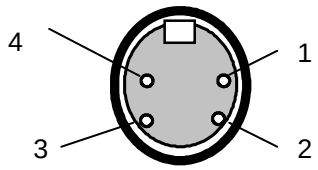
Jack Number	*Cable Description*	*Pin Number*	*Signal Description*
J23	Line Speed Encoder	4	GND
		1	+24V
		3	B Signal
		2	A Signal

Table 0-9 J23-Line Speed Encoder

Jack 24 - Feeder Interlock

Jack 24, the *Feeder* interlock, is located on the Feeder Front PCB (70485-02). Table 0-10 illustrates the two (2) pin connection of J24. A *short* across the pins *enables* the Feeder and an *open* across the pins *disables* the Feeder. Each Feeder is shipped with a *DummyPlug* in J24 enabling the Feeder.

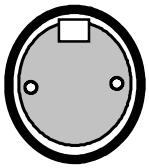
Jack Number	*Cable Description*
J24	Feeder Interlock
	

Table 0-10 J24-Feeder Interlock

Internal Connections

Motherboard (P/N 82202-0E) Pin Assignments

Motherboard - Plug 3

P3 is located on the Motherboard (P/N 82202-0E) and contains the output signal to the LCD display. The output signal continues on P4.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P3	Motherboard	70018-00	1	DB 7
			2	DB 6
			3	DB 5
			4	DB 4
			5	DB 3
			6	DB 2
			7	DB 1
			8	DB 0
			10	R/W
			9	E1

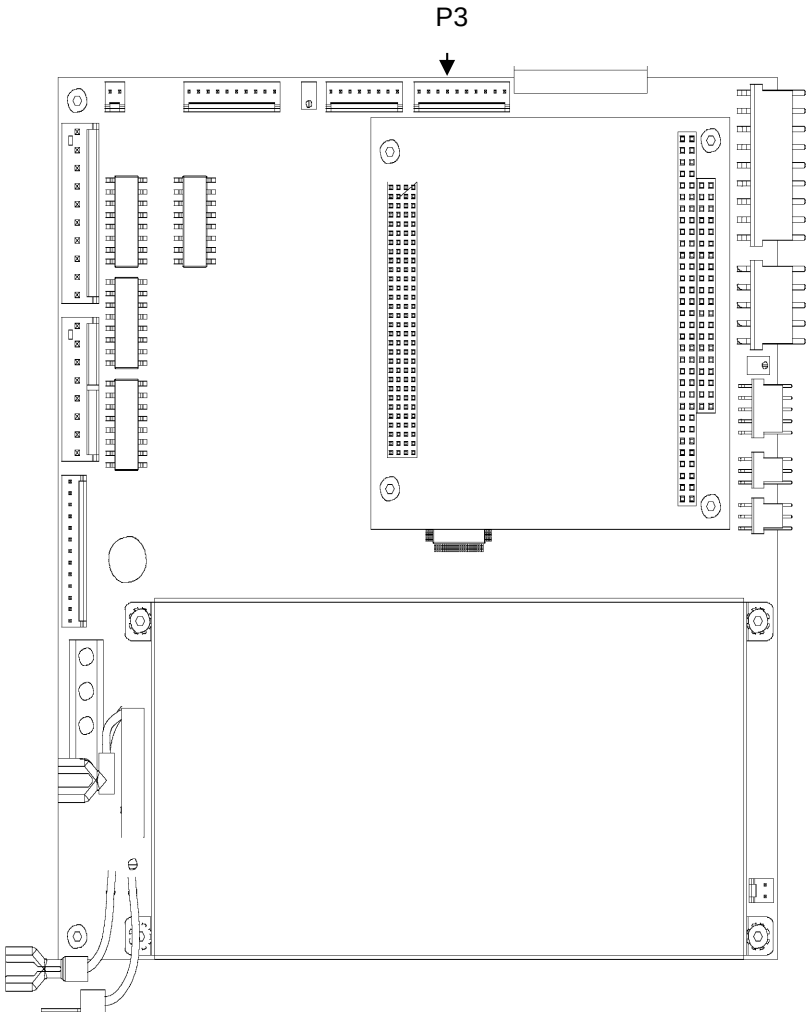


Table 0-11 P3

Motherboard - Plug

P4 is located on the Motherboard (P/N 82202-0E) and contains the output signal to the LCD display. P4 is a continuation of P3.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P4	Motherboard	70018-00	1	RS
			2	Vo
			3	Vss
			4	Vdd
			5	E2
			6	NC1
			7	NC2
			8	NC3

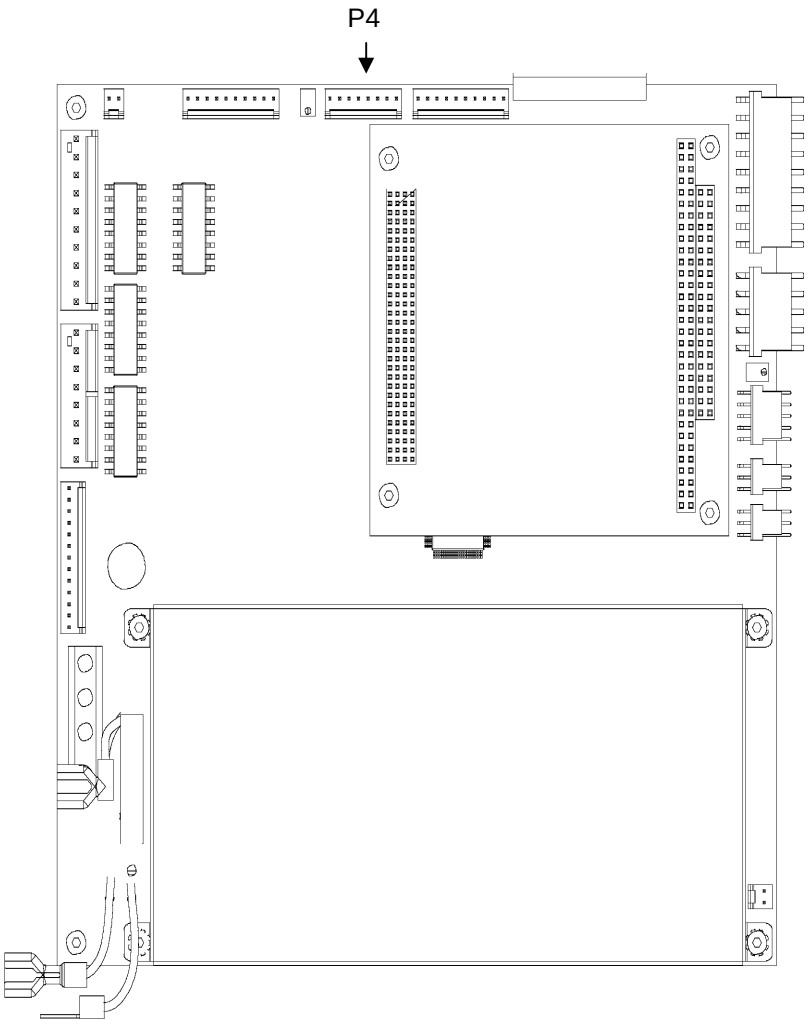


Table 0-12 P4

Motherboard - Plug 6

P6 is located on the Motherboard (P/N 82202-0E) and contains the input signals from the keypad.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P6	Motherboard	700XX-00	1	Row1
			2	Row2
			3	Row3
			4	Col1
			5	Col2
			6	Col3
			7	Col4
			8	Col5
			9	Row4
			10	Row5
			11	Row6
			12	Col6
			13	Ground

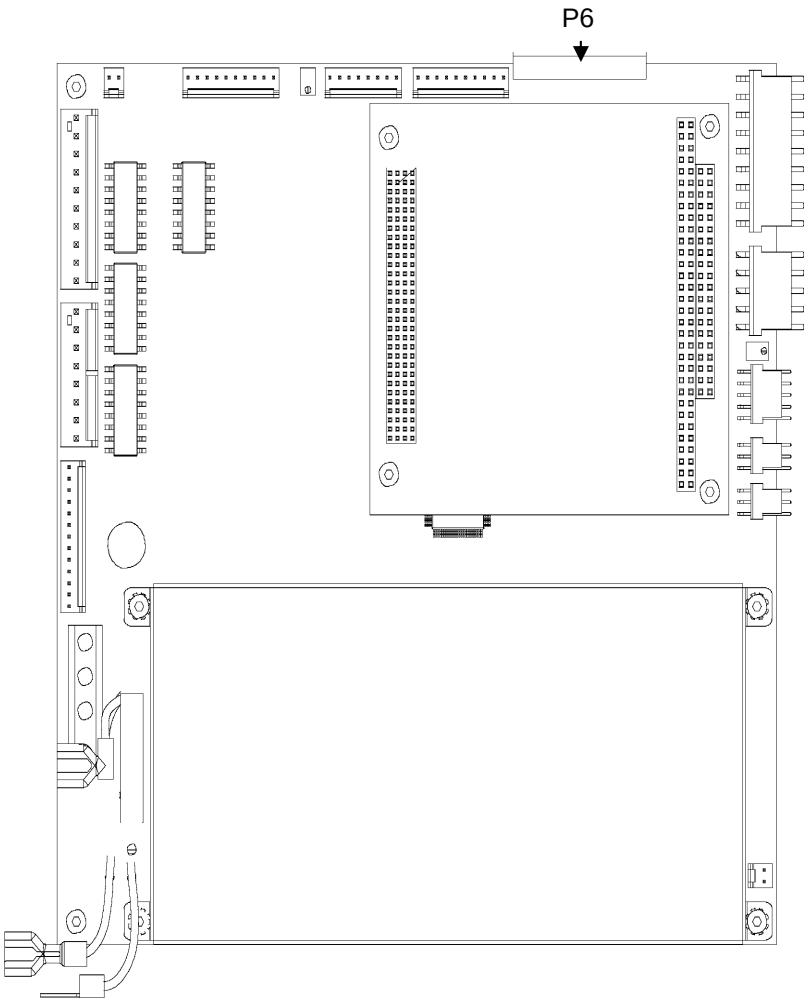


Table 0-13 P6

Motherboard - Plug 7

P7 is located on the Motherboard (P/N 82202-0E) and contains the motor encoder signals.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P7	Motherboard	700XX-00	1	Encoder A+
			2	Encoder A-
			3	Encoder B+
			4	Encoder B-
			5	Encoder Z+
			6	Hall 1+
			7	Hall 1-
			8	Hall 2+
			9	Hall 2-
			10	Hall 3+
			11	Hall 3-
			12	+5 VF
			13	Ground

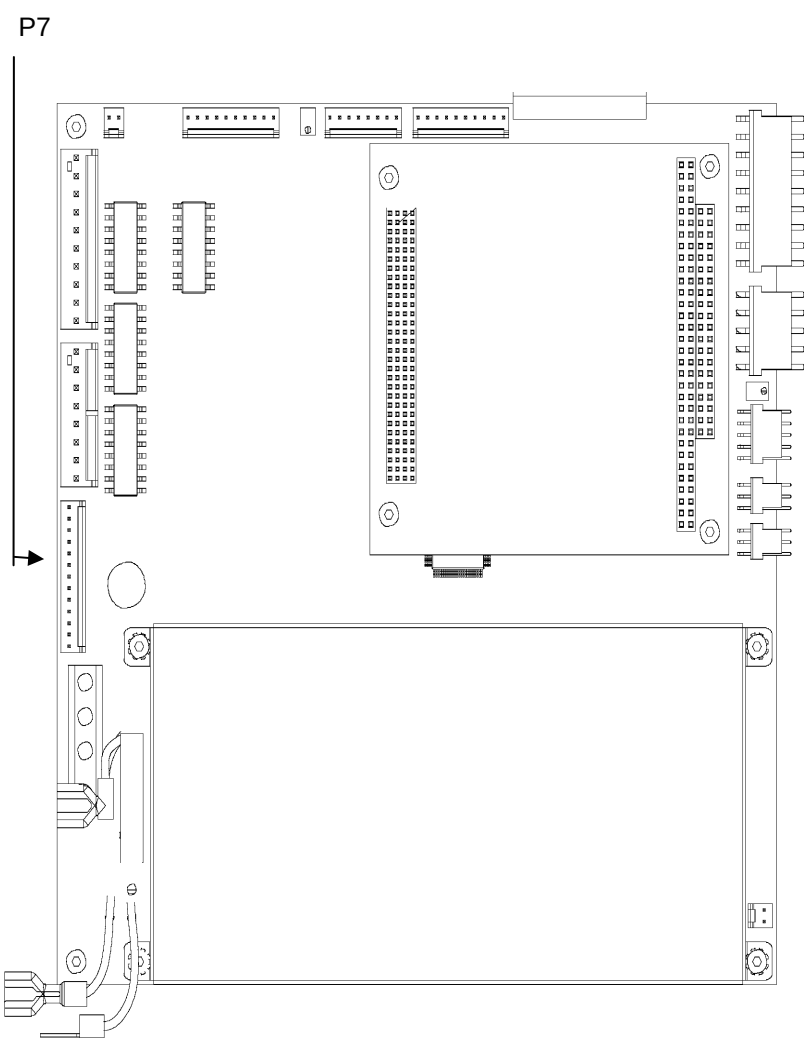


Table 0-14 P7

Motherboard - Plug 9

P9 is connected to the Motherboard (P/N 82202-0E) and contains the status signals that connect to Start/Status (J1) and Low Product (J3).

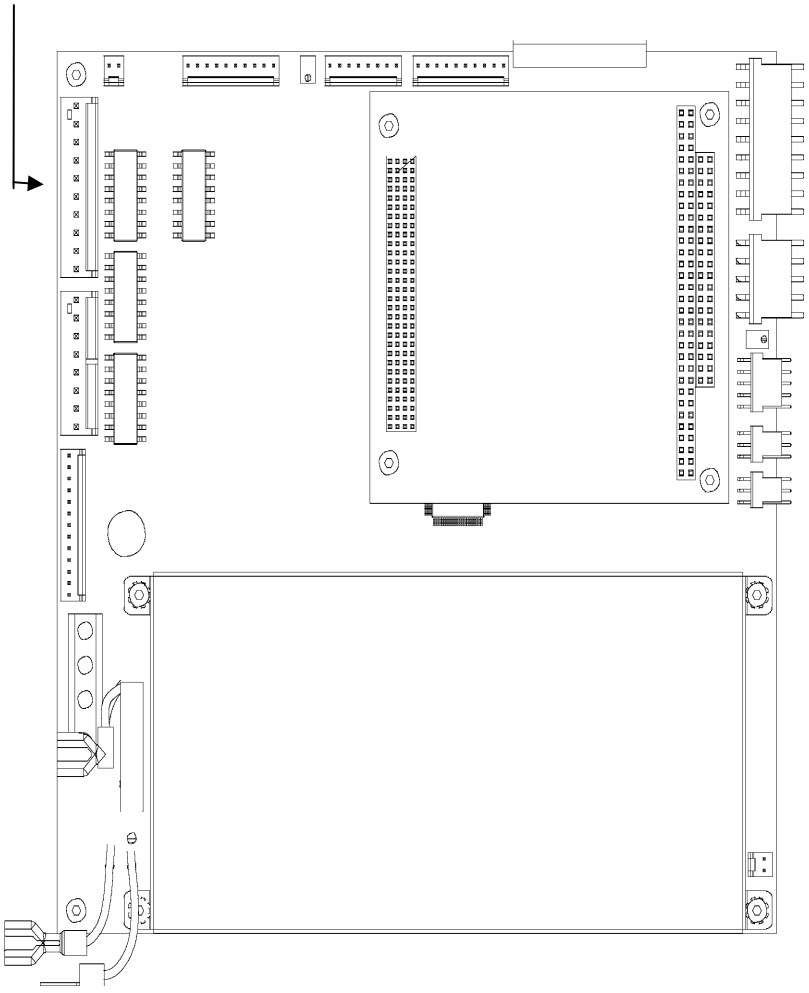
Interconnect	Location	Pigtail	Pin Number	Signal Description
P9	Motherboard	-	1	Ready (Programmable Output)
P9 			2	Red (Fault)
			3	Status Select
			4	Cycle Complete
			5	Demo Mode Start (Prog. Outp.)
			6	Auto On/Off (Prog. Outp.)
			7	Low Product (Prog. Outp.)
			8	Start Pulse In
			9	+24 V from Feeder
			10	+24 V External

Table 0-15 P9

Motherboard - Plug 10

P10 is connected to the Motherboard (P/N 82202-0E) and contains the signals that are connected to the APL Interface (J2).

Interconnect	Location	Pigtail	Pin Number	Signal Description
P10	Motherboard	-	1	+24 V External Ground
			2	Motherboard Ground
			3	Open
			4	+24 V from APL
			5	Low Product Input
			6	APL Status
			7	Drop Device Status
			8	APL (Enable/Disable)

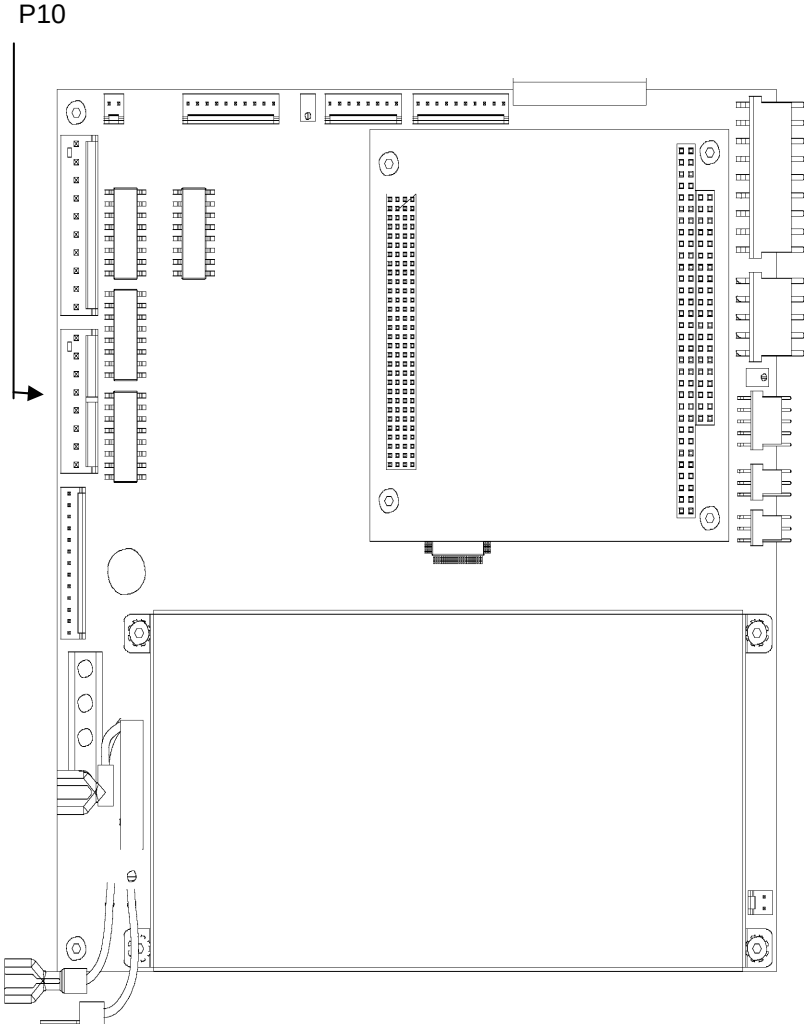


Table 0-16 P10

Motherboard - Plug 11

P11 of the Motherboard (P/N 82202-0E) provides DC power to drive Fan 1

Interconnect	Location	Pigtail	Pin Number	Signal Description
P11	Motherboard	70187-00	1	+24 V from Feeder
			2	Ground

P11

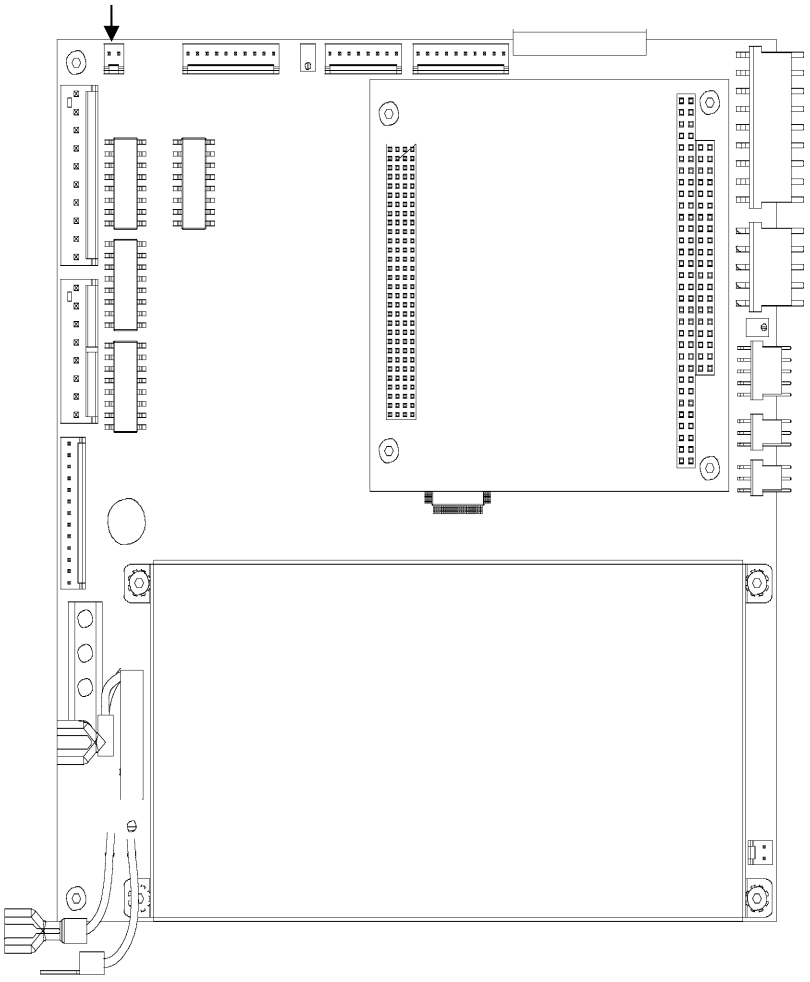


Table 0-17 P11

Motherboard - Plug 12

P12 is connected to the Motherboard (P/N 82202-0E) and contains the signal that is connected to the Signal Light (J22).

Interconnect	Location	Pigtail	Pin Number	Signal Description
P12	Motherboard	-	1	+24V
			2	+5V
			3	Emitter Drive
			4	Detector
			5	Green
			6	Red
			7	Yellow
			8	Blue
			9	Alarm

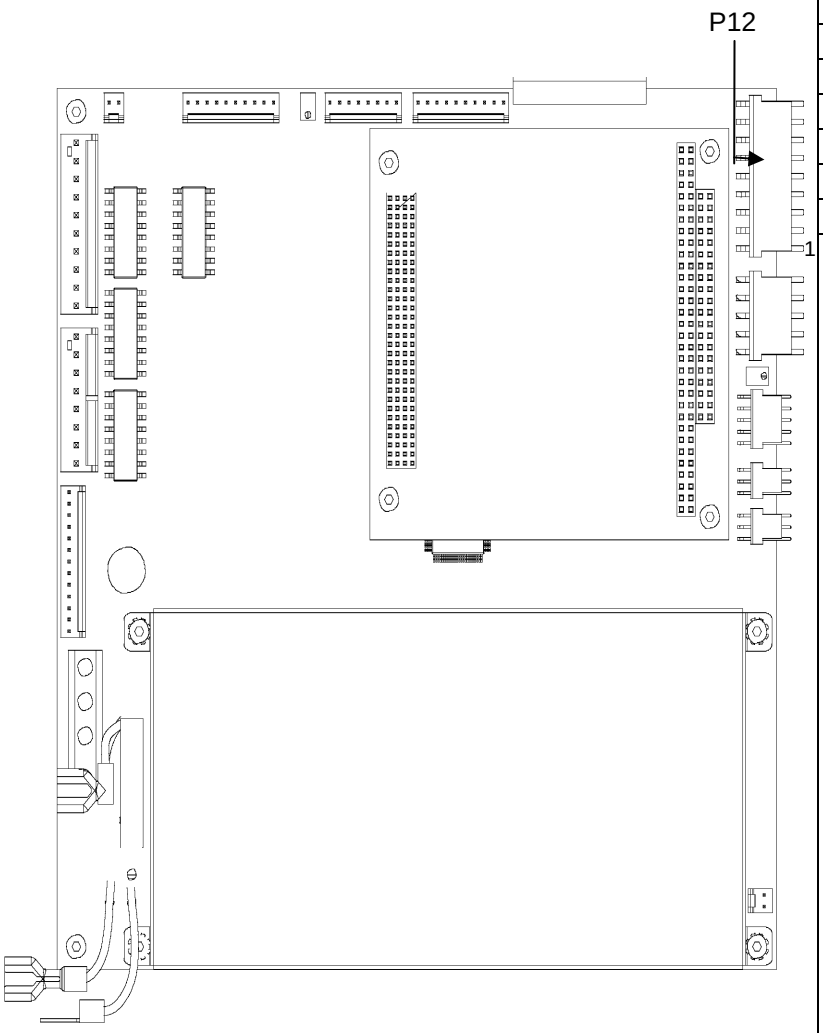


Table 0-18 P12

Motherboard - Plug 13

P13 is connected to the Motherboard (P/N 82202-0E) and contains the signal that is connected to the Product Sensor (J6).

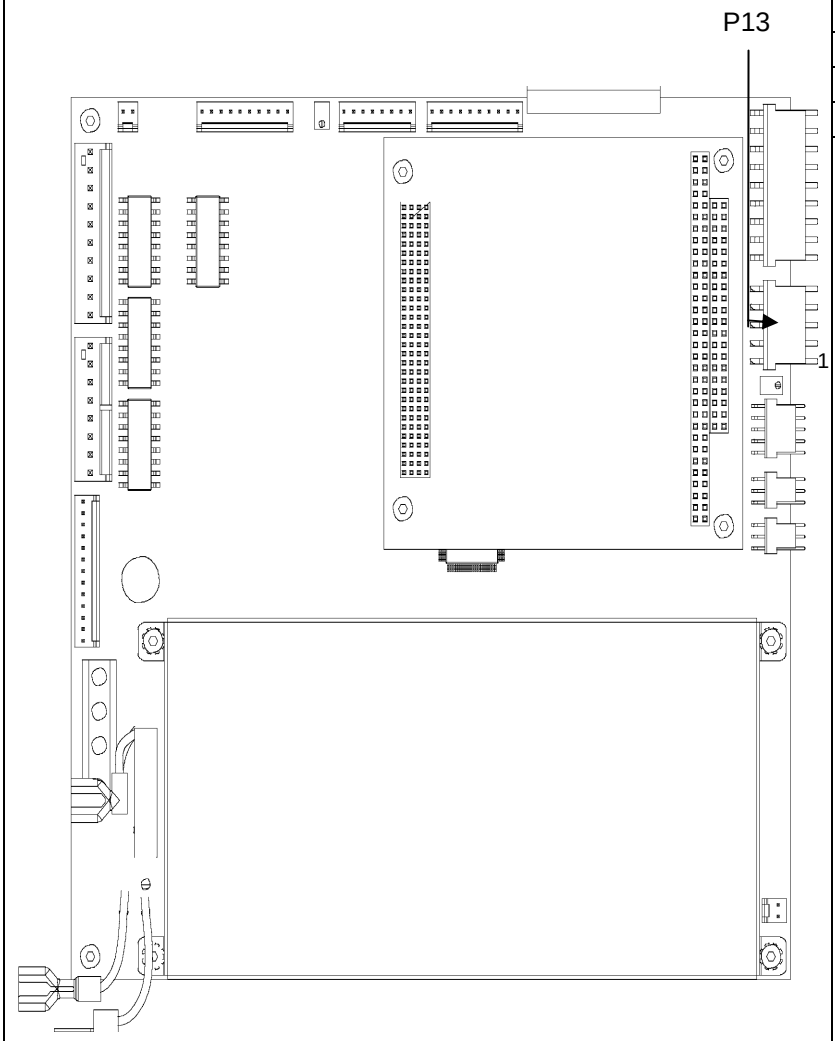
Interconnect	Location	Pigtail	Pin Number	Signal Description
P13	Motherboard	-	1	LSE Encoder A+ Ext.
			2	LSE Encoder B+ Ext.
			3	N/C
			4	Interlock
			5	Ground

Table 0-19 P13

Motherboard - Plug 14

P14 is connected to the Motherboard (P/N 82202-0E) and contains the signal that is connected to the Motor Leads.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P14	Motherboard	70049-00	1	C (black)
			2	B (white)
			3	A (red)
			4	Ground/Shield (green)

P14

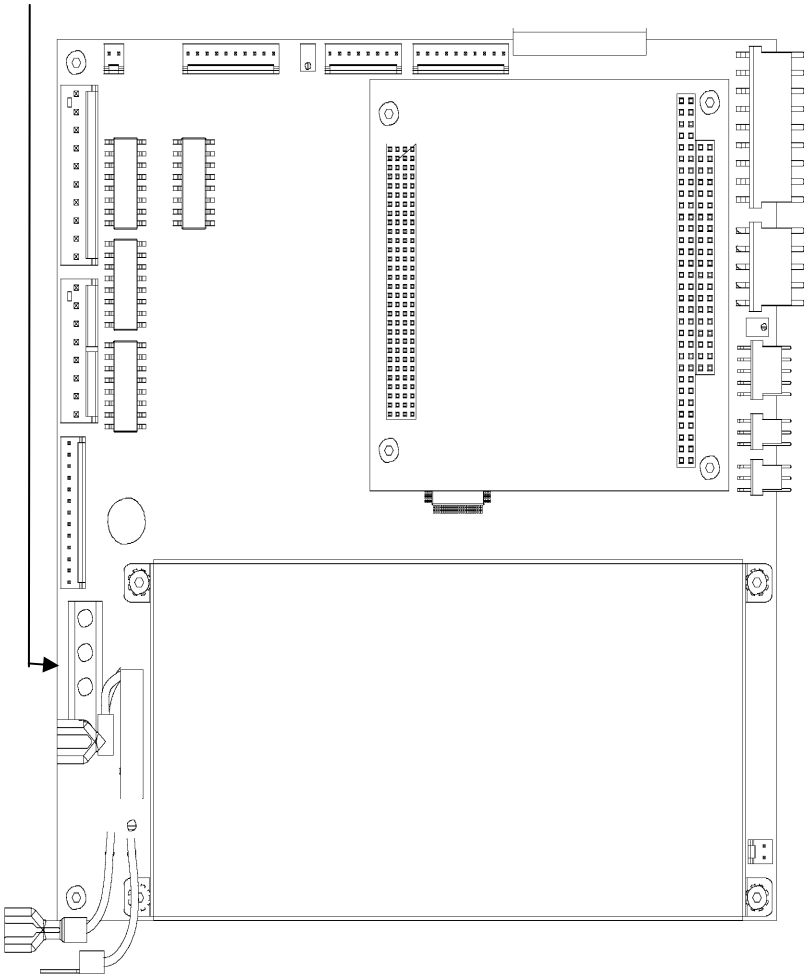


Table 0-20 P14

Motherboard - Plug 15

P15 of the Motherboard (P/N 82202-0E) and provides DC power for Fan 2.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P15	Motherboard	70187-00	1	+24 V from Feeder
			2	Ground

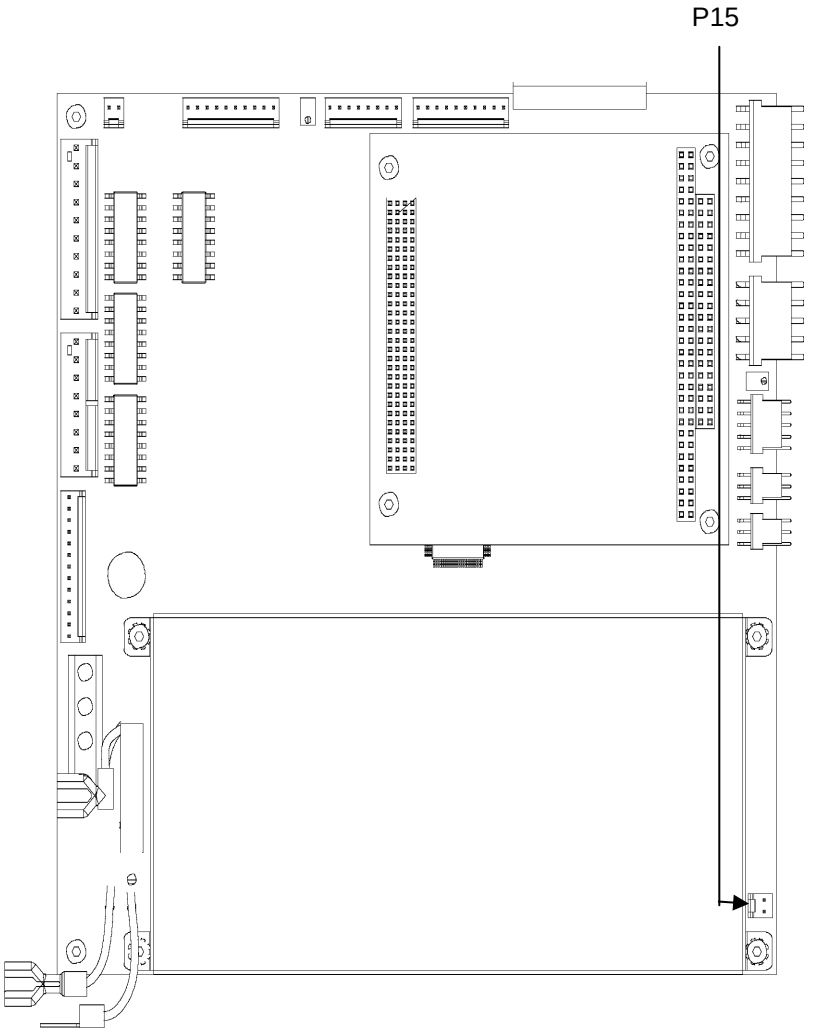


Table 0-21 P15

Motherboard - Plug 16

P16 is connected to the Motherboard (P/N 82202-0E) and contains the signal that is connected to the AC Power Supply Input from the Power Entry Block.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P16	Motherboard	81610-00	1	H1
			2	Neutral
			3	Ground

P16 (3 Pin)

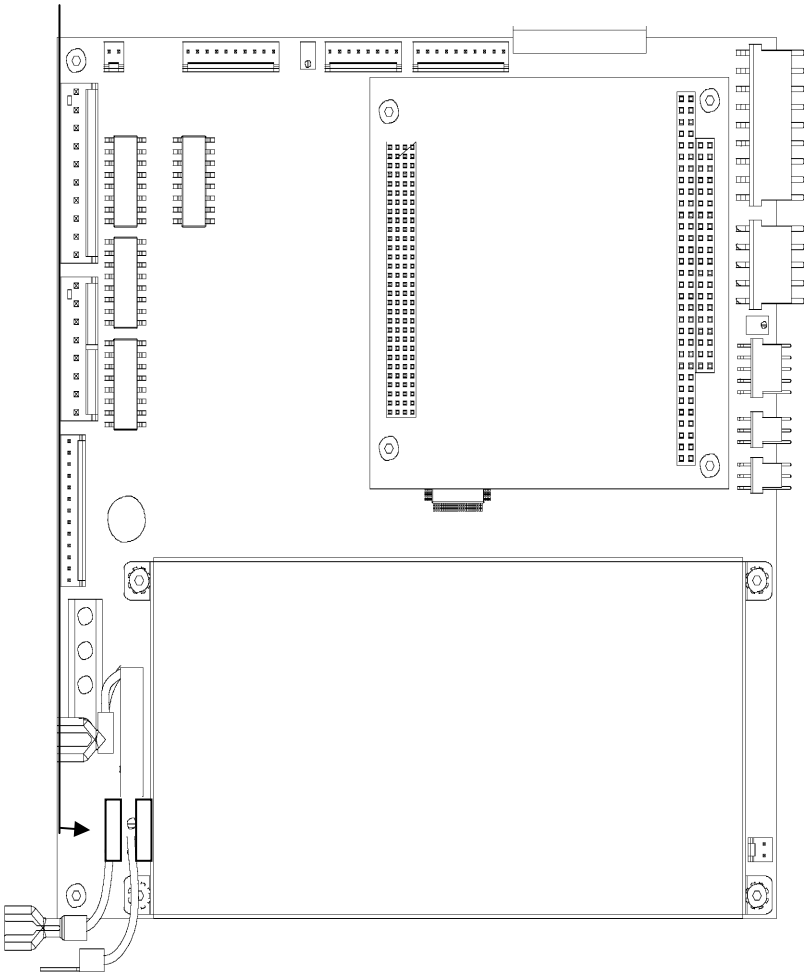


Table 0-22 P16

Motherboard - Plug 17

P17 is connected to the Motherboard (P/N 82202-0E) and contains the signal that is connected to the Stripper Wheel Shaft Linear Pot.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P17	Motherboard	82121-01 (Right)	1	+24 V from Feeder
			2	Wiper 2
			3	Ground

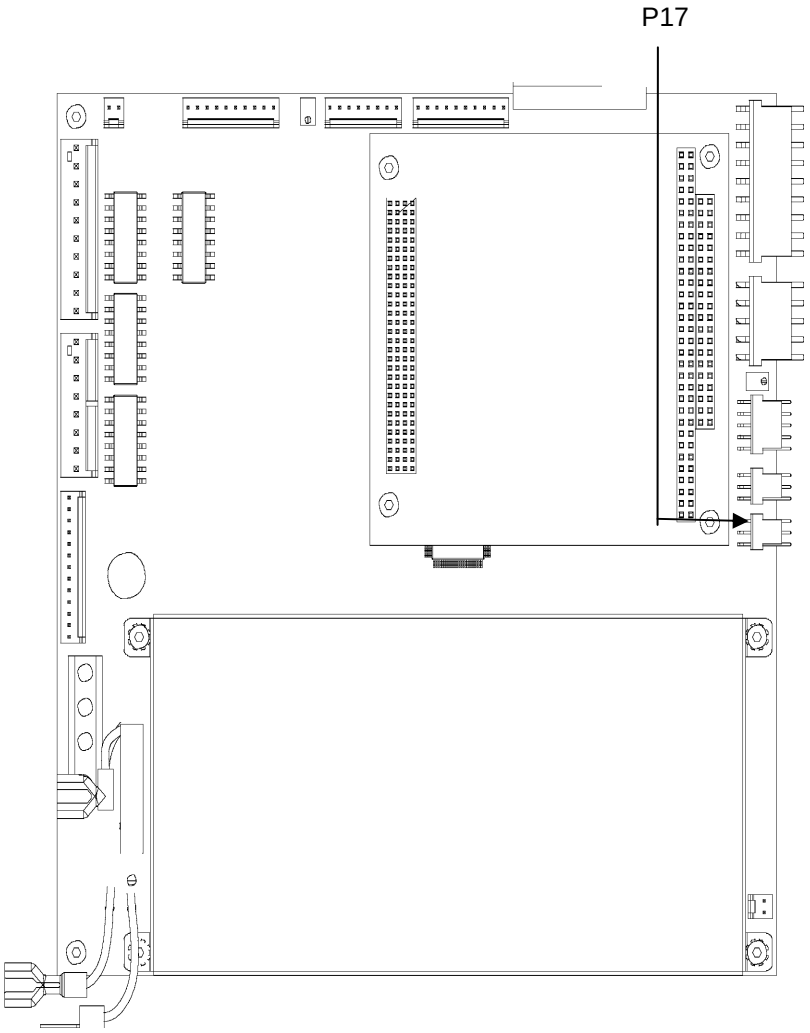


Table 0-23 P17

Motherboard - Plug 18

P18 is connected to the Motherboard (P/N 82202-0E) and contains the signal that is connected to the Upper Exit Shaft Linear Pot.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P18	Motherboard	82121-01 (Left)	1	+24 V from Feeder
			2	Wiper 1
			3	Ground

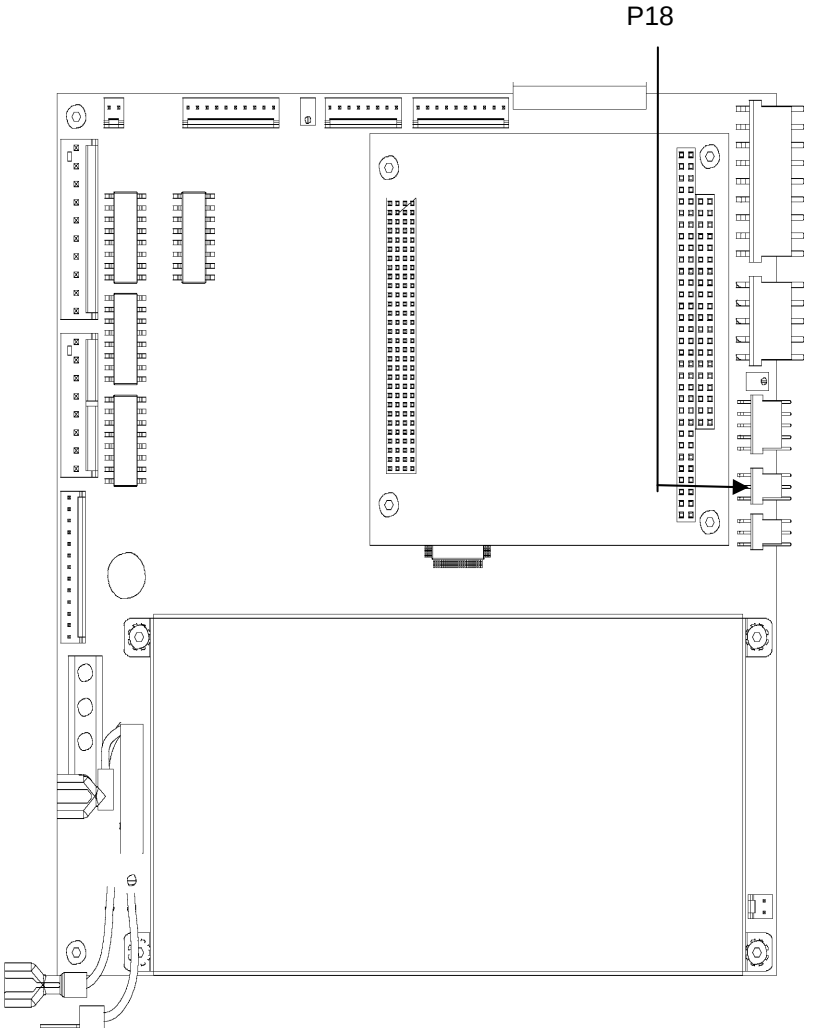


Table 0-24 P18

Motherboard - Plug 19

P19 is connected to the Motherboard (P/N 82202-0E) and contains the signal that is connected to the Low Voltage Power Supply.

Interconnect	Location	Pigtail	Pin Number	Signal Description
P19	Motherboard	55017-00	1	+5 V
			2	+24 V
			3	Ground

P19 (3 Pin)

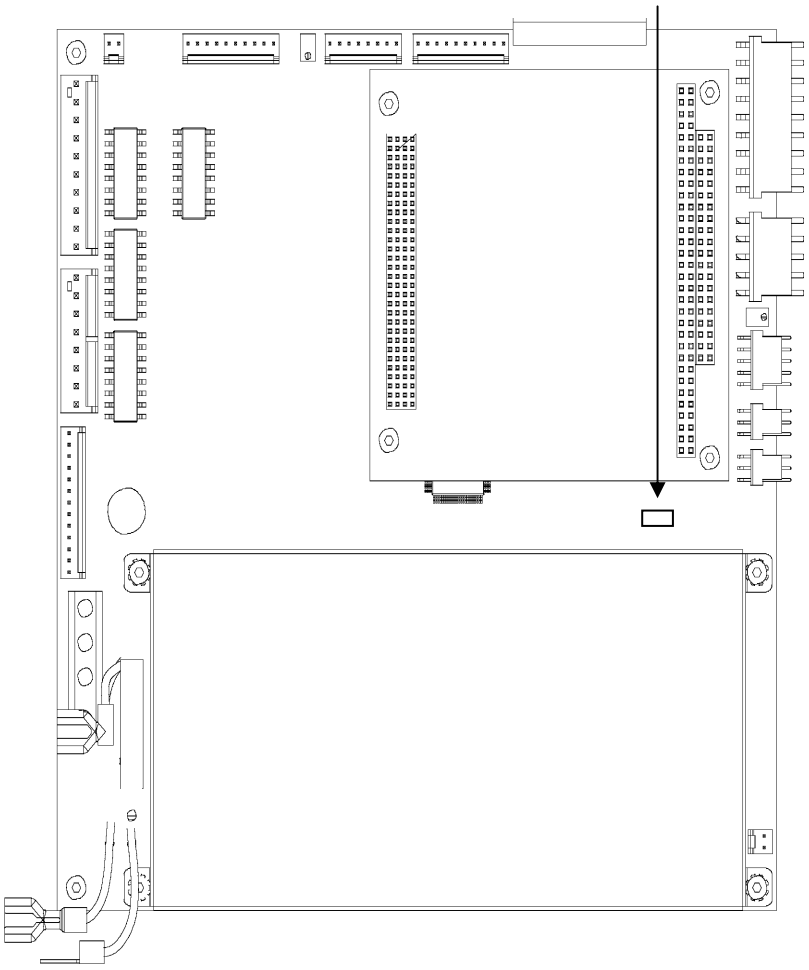


Table 0-25 P19

Motherboard - Plug 20

P20 is connected to the Motherboard (P/N 82202-0E) and contains the signal that is connected to the DC Power Supply (P/N 55017-00).

Interconnect	Location	Pigtail	Pin Number	Signal Description
P20	Motherboard	55017-00	1	H1
			2	Neutral
			3	Ground

P20 (3 Pin)

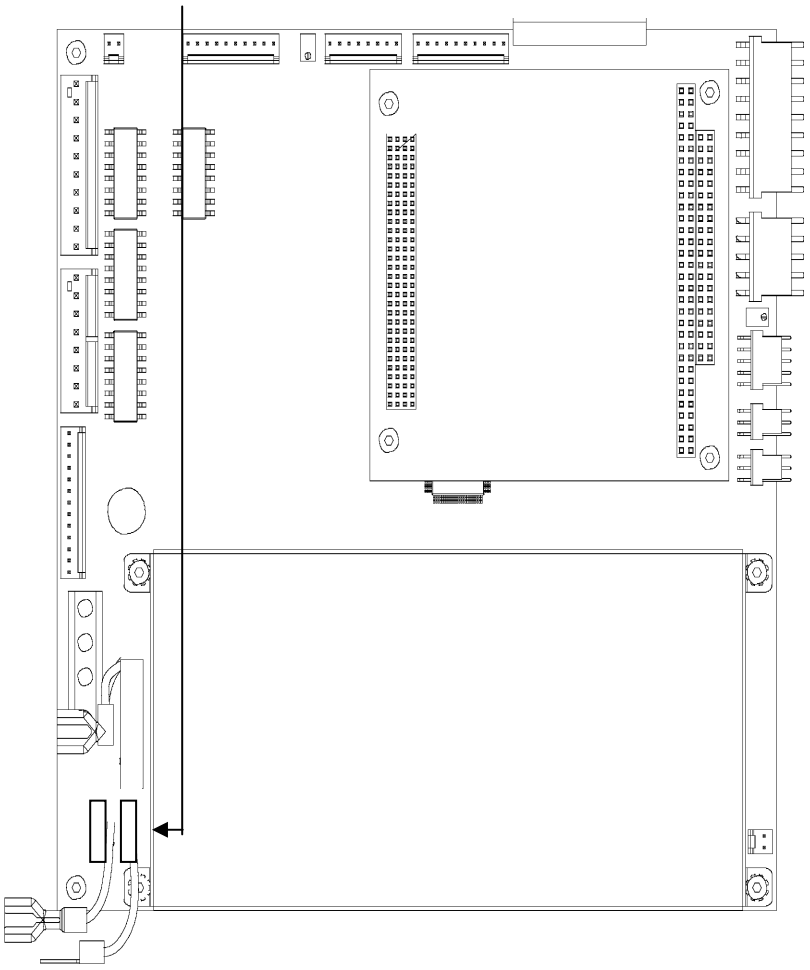


Table 0-26 P20

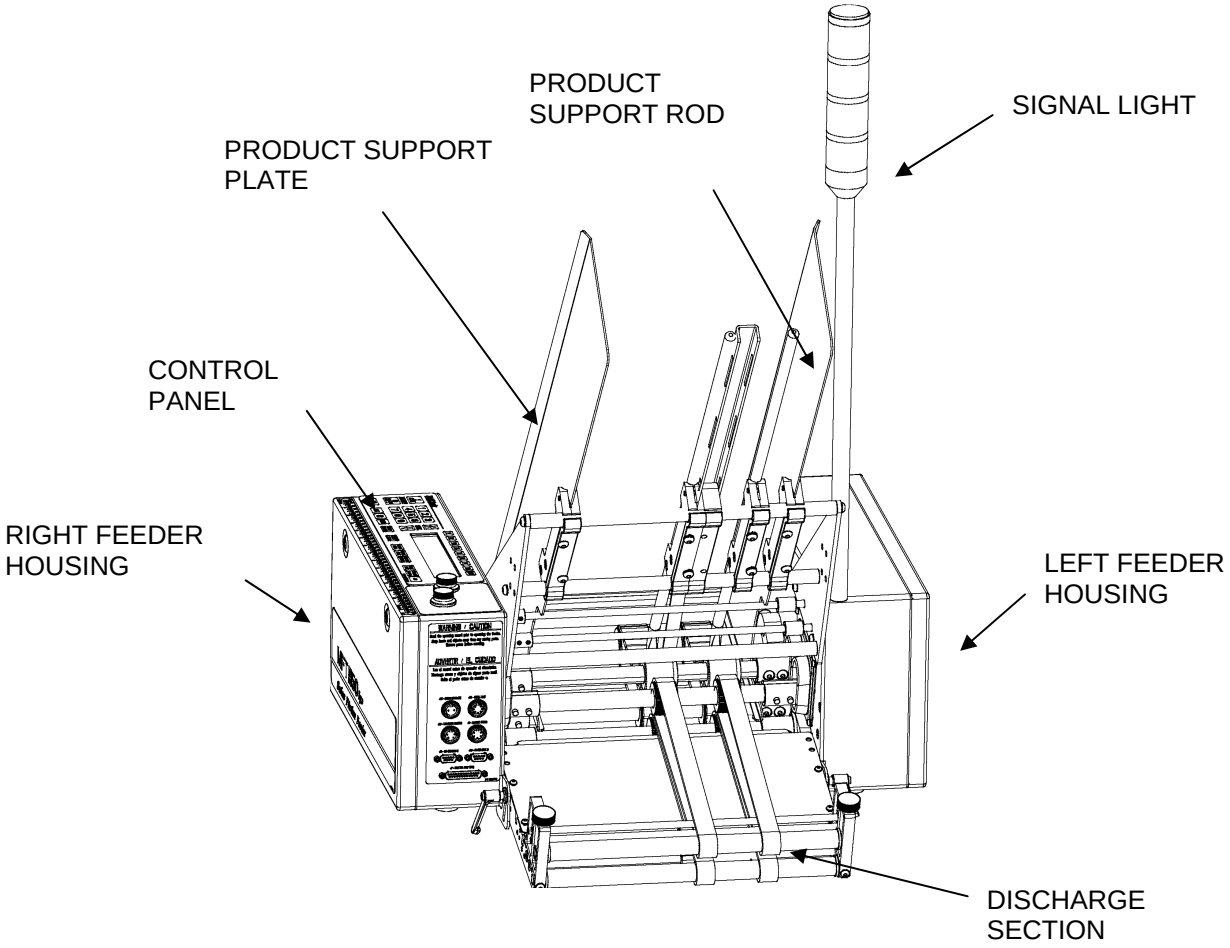
APPENDIX

Troubleshooting

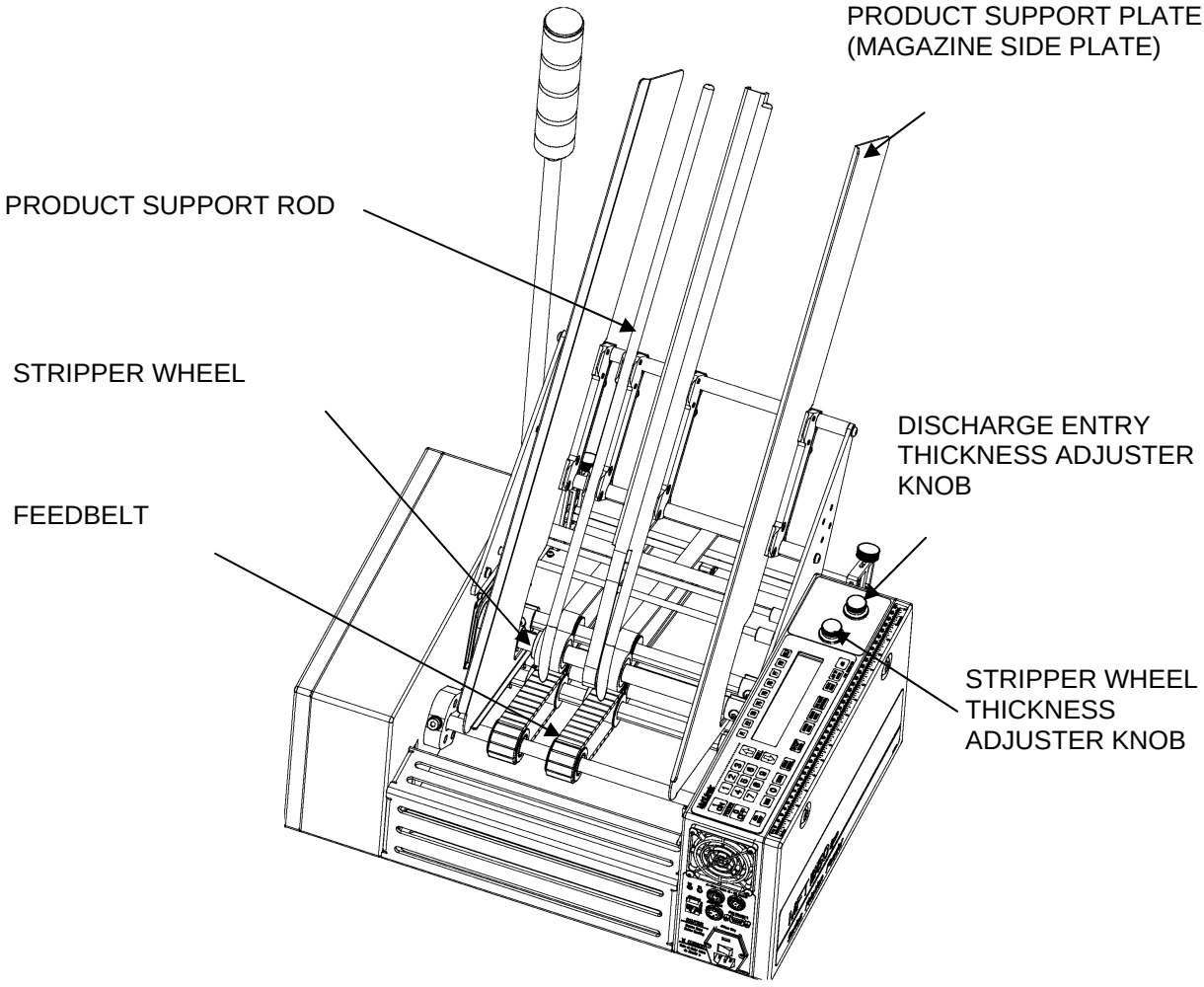
This section of the manual provides basic troubleshooting information. The information isolates and resolves common problems that may occur when operating the MFT Friction Feeder. Attempt only one remedy at a time and return the setting to its original position if the remedy is not effective. For maximum effectiveness, it is also recommended several slight adjustments are made, rather than one large adjustment.

If you are unable to identify or resolve the problem, or if you suspect a machine malfunction, call Multifeeder Technology at (651) 407-3100 Monday - Friday, 8 a.m. to 5 p.m. (CST). Please be near your MFT Friction Feeder when you call.

The first troubleshooting table outlines some of the ***basic mechanical troubleshooting*** methods that can solve common feeding problems. Figures 6-1 and 6-2 may be used as references for the terminology used in this section.



Troubleshooting Terminology - Front View



Troubleshooting Terminology - Rear View

WARNING! Before beginning any troubleshooting operations, review the safety section in the front of this manual.

APPENDIX

Basic Mechanical Troubleshooting

Problem	Cause	Solution
Product not coming out straight	Discharge belts set too tight or too loose at discharge exit area	Use the adjuster knobs at the end of the discharge table to adjust the distance between the upper and lower belts so that one product fits snugly. Use the 2-finger tug test to verify proper adjustment. The operator should be able to notice resistance using 2 fingers only tugging at the product while adjusting, but be able to move the product that is properly placed between the belts.
	Discharge belts at discharge exit area are not equally tightened	Use the adjuster knobs at the end of the discharge table to level the discharge exit roller.
	Discharge belts set too tight or too loose at beginning of discharge	Use the discharge adjuster screw to adjust the distance between the upper and lower belts so that one product fits snugly.
	Stripper Wheels are too tight	Use the thickness adjuster knob to raise the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test described above to verify.
	Product support curves are not equal in height	Adjust the height of the product support curves so they are equally distant from the product.
	A feed belt or discharge belt pulley is loose and slipping on the shaft	Reset the pulley and tighten the setscrews.
	Stripper Wheels are different sizes (due to uneven wear)	Replace *Stripper Wheels* – Call Multifeeder Technology.
Feeder dispenses doubles	*Stripper Wheels* are either too tight or too loose	Use the thickness adjuster knob to raise the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test described above to verify.
	Too much product weight is on the feed belts	Raise the product support curves to reduce the amount of product in contact with the belts.
Stripper wheel shaft does not turn	*Stripper Wheels* are too tight	Use the thickness adjuster knob to raise the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test to verify.

Feed Belts move but discharge belts do not	The set screws on the discharge drive belt pulley are loose	Open the mechanical housing and tighten the set screws on the discharge drive belt pulley
Feed Belts move but product does not feed	*Stripper Wheels* are too tight	Use the thickness adjuster knob to raise the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test to verify.
	Not enough product weight is on the feed belts	Lower the product support curves to increase the amount of product in contact with the belts.
	Feed Belts are dirty	Clean the feed belts.
	Magazine side plates are too close together	Adjust the distance between the magazine side plates so there is approximately 3mm on each side of the product stack.
Feeder feeds continuously with no gap between products	*Stripper Wheels* are too loose	Use the thickness adjuster knob to lower the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test described above to verify.
	Too much product weight is on the feed belts	Raise the product support curves to reduce the amount of product in contact with the belts.
	Stripper Wheels are dirty	Clean the *Stripper Wheels* .
	Too much static on product	Use a humidifier or static elimination system to improve performance.
Feed Belts are tracking off the pulleys	*Stripper Wheels* are too tight	Use the thickness adjuster knob to raise the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test described above to verify.
	Too much product weight is on the feed belts	Raise the product support curves to reduce the amount of product in contact with the belts.
Discharge belts are tracking off the pulleys	Discharge belts are set too tight	a) Use the knobs at the end of the discharge table to adjust the distance between the upper and lower belts so that one product fits snugly. Use the 2-finger tug test described above to verify. b) Use the discharge adjuster knob to adjust the distance between the upper and lower belts so that one product fits snugly.

	Top or bottom discharge shaft is not rotating properly	Open the mechanical housing and inspect for loose drive belt pulleys. Tighten setscrews if necessary.
Repeated misfeed faults	Feeder is receiving a start pulse while it is feeding another product	a) Increase the motor speed -or- b) Decrease the start pulse rate
MPD fault with no MPD present	Product contains a dark area which is read as a double product	a) Move the emitter-receiver pair away from the dark area. -or- b) Take a product thickness reading in the dark area.
Repeated MPD faults	*Stripper Wheels* are too loose	Use the thickness adjuster knob to lower the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test described above to verify.
Repeated 'Watch Dog - No Product' faults	Jams in the feeding mechanism area are preventing products from reaching the sensors	Clear the jams and make necessary height adjustments. Use the 2-finger tug test described above to verify.
	Watch Dog No Product Length setting is incorrect	Check and update the Watch Dog No Product Length setting.
Repeated 'Watch Dog - Product Jam' faults	There is not enough space between products/products are overlapping	Use the thickness adjuster knob to lower the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test described above to verify.
	Product length was not updated for new product	Measure and update the product length value.
	Product separation length is too long	Reduce the 'Product Separation Length' value.
Gap is present but *Feeder* displays 'Watch Dog Product Jam' fault	Emitter-receiver pair is positioned under a discharge belt	Relocate the emitter-receiver pair . Verify that the emitter/receiver pair is vertically aligned.
	Product length setting is incorrect	Update the product length setting.
	Emitter-receiver pair is faulty	Inspect the emitter-receiver pair cable assembly for cuts or damage.
Feeder jams during operation	*Stripper Wheels* are too tight	Use the thickness adjuster knob to adjust the *Stripper Wheels* so there is slight resistance when you slide one product beneath the wheels. Use the 2-finger tug test described above to verify.

	Product was loaded incorrectly in the *Feeder*	Remove product stack and reload.
Feeder does not dispense when feed signal is activated	Feeder is not in AUTO ON mode	Press the AUTO ON/OFF hot key to toggle to AUTO ON mode. Note! The AUTO ON/OFF key is only active in the *Feeder* ready condition (green light on).
Feeder dispenses at an incorrect time interval on host machine	Start signal to *Feeder* is incorrectly positioned Time delay setting is incorrect	Reposition the sensor or adjust the start signal. Adjust the time delay.

APPENDIX

Advanced Electrical Troubleshooting

The second troubleshooting table outlines the ***advanced electrical troubleshooting*** methods that may solve electrical *Feeder* problems, should they occur.

WARNING! Advanced electrical troubleshooting should only be performed by a qualified technician. The MFT Friction Feeder operates on 120 VAC. Contact with this voltage can lead to serious injury, or death.

Problem	Cause	Solution
Unit does not power up	No power at *Feeder*	Check for power to *Feeder* - line voltage Check outlet
Feeder does not power up	Blown fuse Loose connection inside *Feeder*	With power removed, use a flat head screwdriver to remove the fuse from the power entry module. Test fuse with a VOM and replace if necessary a) Check connections inside *Feeder* and tighten if necessary b) Check power supplies 24, 12, -12, and 5V
Fuse is blown on power up	Wrong fuse was installed	Reinstall the correct type of fuse (5x20mm, 10A, 250V)
Feeder not responding	Computer is locked up Malfunctioning computer	Power down and restart machine Call Multifeeder Technology
LCD is scrambled	Loose connection Static buildup on the product may be discharging through product sensor pair.	Check connection to LCD display and tighten if necessary Dissipate static prior to the sensor pair. Call MTF for antistatic device
LCD has dark spots	Malfunctioning LCD Malfunctioning Motherboard	Replace LCD - Call Multifeeder Technology Replace LCD - Call Multifeeder Technology
LCD blank but *Feeder* okay	Malfunctioning Computer	Call Multifeeder Technology
Membrane keypad keys do not register	Loose connection Malfunctioning membrane keypad	Check connection to membrane keypad and tighten if necessary Replace membrane keypad - Call Multifeeder Technology

Membrane keypad keys register, but motor does not run	Loose connection Malfunctioning motor amplifier board Malfunctioning motor or motor encoder	Check connection to amplifier board and tighten if necessary Check bus voltage on amplifier board Rotate motor by hand and use an oscilloscope to check for pulses on A, /A, B, /B, I, and /I. If no pulses are present replace motor encoder.
Emitter-receiver pair does not see product	Emitter-receiver pair is damaged or malfunctioning Motherboard is malfunctioning	Inspect emitter-receiver pair for damage. Replace if necessary - Call Multifeeder Technology Call Multifeeder Technology
Feeder runs continuously without stopping	Malfunctioning motor amplifier board Malfunctioning motor or motor encoder Malfunctioning computer board	Call Multifeeder Technology Call Multifeeder Technology Call Multifeeder Technology

APPENDIX

Maintenance

The life span of your MFT Friction Feeder is dependent on a regularly scheduled maintenance and inspection program. Given the proper preventive maintenance care, your *Feeder* will perform at an optimal level for many years. By regularly inspecting the equipment, any trouble signs that appear may be resolved before damage occurs. A specially designed maintenance and inspection program is described on the following pages.

WARNING! Before any maintenance tasks are performed, the power must be disconnected from the *Feeder* .

Daily

- Vacuum any dust and debris from the feed belt section, discharge section, and inside edges of the *Feeder* housings.
- Clean the *Feed Belts* and *Stripper Wheels* . **See procedure described below*
- Visually inspect the *Stripper Wheels* and *Feed Belts*for damage or unusual wear.
- Visually inspect the machine for loose screws, bolts, and adjustment knobs.

To clean the *Feed Belts* and *Stripper Wheels* :

1. Turn the Feeder off and disconnect the power cord from the *Feeder*
2. For easier access to the *Stripper Wheels* and feed belts, remove the magazine side plates and support curves.
3. Dip a clean rag in isopropyl alcohol or equivalent cleaning agent.
4. Pressing firmly, wipe the tops of the *Feed Belts* from side to side. Be sure to clean the entire circumference of the belts. Since the power is disconnected, you may use your hand to manually rotate the belts.
5. Visually inspect the inner circumference of the feed belt for paper dust and dirt build up. If necessary, clean the circumference with a dry rag or a rag dipped in a very small amount of isopropyl alcohol.
6. Pressing firmly, wipe the outer surface of the *Stripper Wheels* from side to side. Be sure to clean the entire circumference of the wheels. Since the power is disconnected, you may use your hand to manually rotate the wheels.
7. Use a dry, clean portion of the rag to wipe the *Feed Belts* and *Stripper Wheels* .
8. Reinstall the magazine side plates and support curves, and restore power to the *Feeder* .

Warnings:

Use only isopropyl alcohol or an equivalent cleaning agent to clean *Feed Belts* and *Stripper Wheels* . Other cleaning agents may damage the material.

Isopropyl alcohol is very flammable! Use only in an open area away from any source of ignition, including open flame, sparks, and cigarettes.

Be certain that the *Feed Belts* and *Stripper Wheels* are completely dry before operating the *Feeder* . Damp *Stripper Wheels* will damage the product and damp *Feed Belts* may slip or track incorrectly.

Weekly

- Clean the discharge belts. **See procedure described below*
- Clean the emitter-receiver sensor pair. **See procedure described below*
- Clean the membrane keypad. **See procedure described below*
- Clean the photo optic sensors. **See procedure described below*
- Tighten, if necessary, the set screws on the feed belt pulleys and discharge belt pulleys.

To clean the discharge belts:

1. Turn the *Feeder* off and disconnect the power cord from the *Feeder*
2. Dip a clean rag in isopropyl alcohol or equivalent cleaning agent.
3. Pressing firmly, wipe the tops and bottoms of the discharge belts from side to side. Be sure to clean the entire circumference of the belts. Since the power is disconnected, you may use your hand to manually rotate the belts.
4. Use a dry, clean portion of the rag to wipe the discharge belts.

Warnings:

- Use only isopropyl alcohol or equivalent cleaning agents to clean *Feed Belts* and *Stripper Wheels* . Other cleaning agents may damage the material.
- Isopropyl alcohol is very flammable! Use only in an open area away from any source of ignition, including open flame, sparks, and cigarettes.
- Be certain that the discharge belts are completely dry before operating the *Feeder* . Damp discharge belts may slip or track incorrectly.

To clean the *Emitter-Receiver sensor pair* and photo optic sensors::

1. Use only a dry rag to clean the photo optic sensors. Using an abrasive cleaning agent may scratch the surfaces and impede performance.
2. Gently wipe the glass surfaces on both the emitter and receiver.

Warning:

- Use only a dry rag to clean the emitter-receiver pair. Using an abrasive cleaning agent may scratch the surfaces and impede performance.

To clean the *Membrane Keypad*:

1. Spray a clean rag with a non-solvent, nonabrasive cleaning agent. (Using a window cleaner is recommended)
2. Gently wipe the membrane keypad and LCD display window.

Warning:

- The use of solvents or abrasive cleaning agents may damage the membrane keypad.

Monthly

- Clean the air intake filters. **See procedure described below*
- Open the *Feeder* housing covers and drive pulley covers. Tighten, if necessary, the setscrews on the drive pulleys.
- Thoroughly inspect all belts, pulleys, bearings, and *Stripper Wheels* for damage or unusual wear.
- Check that all indicator lights (red, yellow, and green) are functional.**See procedure described below*
- Check electrical wire harness ribbon cable assemblies for damage or unusual wear.
- Check that all cable connections are secure and tight.
- Check that the cooling fan is functional.
- Re-grease the needle bearings for the discharge pulley(s).
- Re-grease the bearings in the spanning pulley(s).

To clean the air intake filters:

1. Open the electrical housing lid and remove the gray air intake filters. Close the electrical housing lid.
2. Use a mild soap and water mixture to gently wash the filters.
3. After the filters are completely dry replace them in the electrical housing lid.

Warning!

- Make sure the air filters are completely dry before replacing them in the housing lid. Failure to do so may result in costly damage to the machine's electronics.
- Do not use the *Feeder* while the filters are being cleaned.

To check that the indicator lights are functional:

1. With the magazine full of product, check to be sure the GREEN light is illuminated while the *Feeder* is feeding.
2. Continue to feed until the product level falls below the low product sensor. When this happens, check to be sure the YELLOW light is illuminated.
3. Continue to feed until the *Feeder* runs out of product and stops feeding. Check to be sure the RED light is illuminated when the *Feeder* stops feeding.

Semi-Annually	• Re-grease the stripper wheel clutch bearings. • Check oil level inside the top and bottom discharge rollers. Rollers should be 1/3 full of oil. (If so equipped.)

Yearly	• If necessary, replace *Stripper Wheels* . • If necessary, replace discharge belts.

For information on replacement parts, please call Multifeeder Technology at (651) 407-3100.

APPENDIX

Bearing Maintenance

In addition to the prescribed preventive maintenance schedule, it is very important to monitor the condition of the bearings in the machine. Although the life spans of the bearings are designed to outlast the machine itself, certain environmental factors (excessive dirt, debris, and high temperatures) may decrease the life of the bearings. By following the maintenance regiment prescribed above, most of the potential bearing hazards will be avoided.

If proper attention is given to the bearings, any problems that arise may be addressed and resolved before failure and costly downtime occur. There are many advanced systems and instruments available for monitoring bearings. However, by simply listening, feeling, and visually inspecting the bearings you will become aware of any problems that may arise.

Listen-

When bearings are in good operating condition they make little or no noise while the machine is running. Any grinding, squeaking, loud, intermittent, or irregular noises are signs of bearing trouble. Unfortunately, many times when bearing damage is audible by the human ear severe damage has already occurred. A more accurate method of detecting bearing damage is to use an electronic stethoscope.

When bearing damage is detected, you should stop the machine immediately. If possible, isolate the malfunctioning bearing and examine it for insufficient lubrication and/or particles imbedded in the lubrication. Call Multifeeder Technology for information on replacement bearings.

Feel-

A rise in temperature is another sign of bearing trouble. Fortunately, many times overheating is a result of a lubrication problem - something that can easily be corrected. However, running the machine for an extended time with bearing temperatures above 125^{o}C will reduce the life of the bearing.

When a temperature rise is detected, you should stop the machine immediately. If possible, isolate the overheated bearing and examine it for insufficient/excess lubrication. Call Multifeeder Technology for information on replacement bearings. You should note that a natural rise in temperature will occur for one or two days immediately following lubrication and re-lubrication.

Look-

It is advisable that you periodically check the outer surfaces of the bearings for unusual wear and leakage. You should also check the conditions of the seals. If you notice a lubrication leak you should stop the machine immediately. If possible, identify the location of the leak. Call Multifeeder Technology for information on replacement bearings.

NOTE! During initial break in of the machine, excess grease and/or oil may sweat from sealed bearings.

CE Compliance

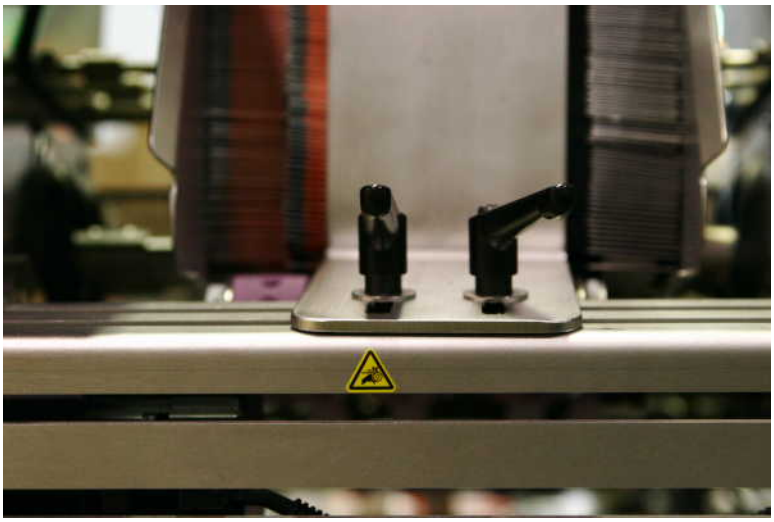
Controls and Connections

Controls and Connections

Controls and Connections

Controls and Connection

CE Compliance – Warning Labels



Pinch Hazard

Turn off power before entering.

Shock Hazard

Disconnect power before entering

Shock Hazard

Disconnect power before entering

Shock Hazard

Disconnect power before entering

Pinch Hazard

Turn off power before entering.

CREDIT APPLICATION

Company Name _____

Billing Address _____

City/State _____

Telephone _____-_____-_____ Fax _____-_____-_____

Business Type: Corporation _____ Partnership _____ Individual _____

Federal Tax ID No. _____ Date Company Started _____-_____-_____

Accounts Payable Contact _____

Is your company sales tax exempt? _____ Yes _____ No (Note, if you checked "Yes", you must attach a copy of the SALES TAX EXEMPTION certificate recognized by your state. If the certificate is not submitted, sales tax will be billed.

Bank Reference:

Name _____ A/C Number _____

Address _____ City/State _____

Telephone _____-_____-_____ Fax _____-_____-_____

Trade Reference:
Company Name_____
Address_____
City/State _____
Telephone _____-_____-_____ Fax _____-_____-_____

Company Name_____
Address_____
City/State _____
Telephone _____-_____-_____ Fax _____-_____-_____

Our standard terms are NET 30 from the date of the invoice with a 1-1/2% monthly charge on all past due invoices.

I herby authorize release of information necessary to establish a line of credit.

Signed _____ Title_____ Date_____

IMPORTANT
Warranty Activation Form

Your Multifeeder equipment has a warranty that is specified in the attached terms and conditions. **In order for this warranty to become effective**, you must complete the warranty registration on this page with in 60 days of shipment of the equipment. Fax or mail (see bottom) this form to Multifeeder Technology, Inc. Customer Service.

If you would like to **establish credit** for your company, please complete the credit application page and fax or mail this form to Multifeeder Technology, Inc. Accounts Receivable.

Model_____ **Serial Number**_____

Your Company_____

Your Contact Name_____

Telephone _____ **Extension** _____

E-mail address _____

Date Warranty Signed and Sent to Multifeeder _____

Date Received by Customer Service at Multifeeder ___-___-_____

Multifeeder Technology Inc. • 4821 White Bear Parkway • St. Paul – MN • 55110-3325 • U.S.A.
Tel (651) 407-3100 • Fax (651) 407-3199 • info@multifeeder.com • www.multifeeder.com

MULTIFEEDER TECHNOLOGY, INC. (MFT) TERMS AND CONDITIONS

ALL SALES ARE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS.

1. Definitions.

1.1 "Accessory Products" mean spare parts purchased, at Buyer's option, to enhance the System or replace components within the System.

1.2 "Agreement" means this Sale Agreement.

1.3 "Buyer" means the person or entity that enters into this Agreement for the design and for manufacture of the System, subsystem accessory products, or related services and/or Buyer's assigns, successor's agents and transferees.

1.4 "Default Specifications" means the MFT Default Specifications set forth in Exhibit A, attached hereto, which set forth the default functional and technical performance criteria for the System.

1.5 "Final Product Throughput" means the end-product as fully processed by the MFT System.

1.6 "MFT" means Multifeeder Technology, Inc.

1.7 The "Operation and Maintenance Manual" means the operative and instruction guide supplied by Seller to Buyer, which addresses one or several of the devices, components or Subsystems within the System.

1.8 "Order" means Buyer's order in the form of Seller's Proposal, signed by Buyer and delivered to Seller.

1.9 "Order Acknowledgement Form" means the written form Seller sends to Buyer indicating that Seller is in receipt of Buyer's Order.

1.10 "Parties" means the Buyer and Multifeeder Technology, Inc.

1.11 "Product Samples" mean Buyer-supplied components and/or material to be fed through and/or processed by the System to create a Final Product Throughput.

1.12 "Product Schedule" means the actions undertaken by MFT to design and build the System over a period of time.

1.13 "Production Schedule Date" means the date upon which production is scheduled for completion.

1.14 "Proposal" means Seller's written description of the System and/or Accessory Products

1.15 "Quote" means the price quote for the System and/or Accessory Products.

1.16 "Seller" means Multifeeder Technology Inc.

1.17 "Shipment Date" means the estimated date upon which MFT anticipates shipment of the System from the MFT facility.

1.18 "Specifications" means the functional and technical performance criteria for the System, as agreed-to by the Parties.

1.19 "Subsystem" means any smaller MFT-designed system that constitutes a component of the overall System.

1.20 "System" means the custom-designed product manufactured by Seller according to the Specifications, which may or may not include various other Subsystems.

1.21 "System Manual" means the operative and instruction guide supplied to Buyer by Seller with the shipment of the System, which addresses the overall System, and may or may not address each separate device, component or Subsystem within the System

2. The System.

2.1 Purchase and Supply. Seller will sell the System and/or Accessory Products to Buyer under the terms and conditions set forth in this Agreement.

2.2 Specifications. The System will be manufactured by Seller according to the Specifications. The Proposal will include a Quote for each component of the System. If the Buyer does not provide specifications prior to the Quotation process, the Default Specifications will apply. All specifications supplied by Buyer are subject to (a) MFT's written approval and (b) signature by a MFT-authorized representative.

2.3 Packing. Unless otherwise specified in this Agreement or Buyer's Order,

the System and/or all Accessory Products are to be packed and identified in accordance with customary industry practice. Seller shall mark each container with necessary lifting, loading and shipping information, including the applicable purchase order number, date of shipment, and the name and address of Seller and Buyer.

3. Assent to Terms and Conditions of Agreement. Unless otherwise indicated, Seller's Proposal will expire thirty (30) days following the date the Proposal is transmitted to Buyer. Seller's Proposal is not binding upon Seller until Buyer's Order is accepted in writing by Seller on an Order Acknowledgement Form. Buyer's Order must be submitted within the timeframes provided herein.

4. Price, Price Adjustment & Additional Charges.

4.1 Price. The purchase price for the System will be set forth in the Quote. The pricing of Accessory Products is subject to change from time to time.

4.2 Price Adjustment. The purchase price in the Quote may be increased to reflect increases in the cost of materials or labor, if:

4.2.1 Shipment of the System is scheduled for a date that is more than three (3) months after the date of Buyer's Order;

4.2.2 Shipment of the System is delayed by Buyer to a date that is more than three (3) months after the date of Buyer's Order; or

4.2.3 Shipment of the System is accelerated due to an accelerated Production Schedule Date.

4.3 Delivery, Risk of Loss and Title. The System will be delivered f.o.b. Seller's Minnesota facility. Buyer will pay all packaging, handling and freight to Buyer's destination. Risk of loss or damage to the System passes to Buyer at the time of delivery to the carrier. Seller will purchase shipping insurance at Buyer's request and at Buyer's expense. Transfer of title is not deemed to occur until payment in full has been received by Seller. Shipment dates are Seller's best estimate of when product(s) will be shipped or delivered, but the Shipment Date is not guaranteed.

4.4 Taxes. Buyer will pay all duties and taxes including sales, use, property, excise, value added and gross receipts taxes levied on the System or Accessory Products. Seller will not collect an otherwise applicable tax if Buyer's purchase is exempt from Seller's collection of such tax and a valid tax exemption certificate is furnished by Buyer to Seller.

4.5 Cancellation of Orders. Following Seller's acceptance of Buyer's Order, the Order can be cancelled only with Seller's written consent. A minimum cancellation charge of 35% of the purchase price of the System or Accessory Products will be assessed and will vary according to the date on which the cancellation occurs in the Production Schedule, the quantity of work and materials that are salvageable, the degree to which the System is custom-designed, and other factors in MFT's sole discretion.

4.6 Additional Charges. Additional work completed or time consumed by reason of Buyer's alterations or delays caused by Buyer, will be charged to Buyer at Seller's current price for work or material at the time of such alterations, changes, or delays.

5. Payment.

5.1 Payment of Purchase Price. If Seller approves Buyer for credit, the payment schedule is (a) 55% of the purchase price in certified or other currently available funds within five (5) days following acceptance of Buyer's Order; (b) no later than ten (10) days before Buyer's requested shipment date (i) 35% of the purchase price in certified funds; and (ii) the remaining balance by Buyer's delivery of an irrevocable letter of credit or some other MFT-approved payment alternative, drawn on a U.S. bank in an amount equal to the remaining balance due for the benefit of Seller or Seller's agent. The letter of credit and/or its equivalent must be drawn on a financial institution and in form reasonably acceptable to Seller, must be in U.S. dollars, and will expire no earlier than 60 days after the requested shipment date. Under no circumstances will Seller be liable to Buyer for delays in shipment caused by Buyer's delay in payment.

If Seller does not approve Buyer for credit, payment will be disbursed to Seller within five (5) days following acceptance of Buyer's Order by certified or other currently available funds or by Buyer's delivery of an irrevocable letter of credit or some other MFT-approved payment alternative, drawn on a U.S. bank in an amount equal to the full amount of the purchase price. The letter of credit and/or its equivalent shall provide for interim draws in accordance with the schedule referenced in the preceding paragraph, be drawn on a financial institution and in form reasonably acceptable to Seller, in U.S. dollars, and will expire no earlier than 60 days after the requested shipment date.

Buyer authorizes Seller to review any and all necessary credit reports and information to assess whether Seller will extend credit to Buyer.

5.2 Invoicing for Ongoing Services and/or Accessory Products. Seller will invoice Buyer for any ongoing services or Accessory Products purchased separately from Buyer's Order for the System. Invoices will reference purchase order number, item number and description of product(s) and/or service(s), unit price of products and/or service(s), total amounts due, and the due date. Invoices shall be due and payable within thirty (30) days after the date of invoice. Payments will be applied to oldest invoices first. Overdue invoices will accrue interest at a rate equal to the lesser of 18% per annum or the maximum rate allowable by law.

5.3 Non-payment of Amounts Due. Seller hereby retains a security interest in the System or Accessory Products for any portion of the purchase price thereof unpaid by Buyer. Seller is authorized to perfect its security interest. In addition, if payment in full is not made within sixty (60) days following delivery of the System, or within 60 days of the invoice date for any and all additional charges accrued by Buyer, whichever applies, Seller may at its sole discretion, activate the control software installed in the System that will disable the System from functioning. Upon receipt of full payment, Seller will reactivate the System.

6. Performance of System and Product Samples.

6.1 Acceptance Criteria of System Performance. The acceptance testing shall be conducted in two (2) phases, as set forth below:

6.1.1 Phase One Acceptance Testing. Prior to shipping the equipment from the Multifeeder Technology, Inc. facility to the place of delivery, MFT will conduct a system performance test mutually-agreed upon with the Buyer and reduced to a writing signed by both Parties. Buyer may, at its option, witness the Phase One Acceptance Test in person or by electronic means supplied by MFT.

If the Parties do not agree upon an a specific test, the Parties agree that MFT will conduct a 30-minute test demonstrating 90% uptime, after excluding any lost time or lost production due to Nonconforming Product Samples (defined in section 3.3 of Exhibit A and all related subsections) or other factors out of MFT's control. MFT reserves the right to restart or continue the test until completed, or to abbreviate the test by discounting lost time or lost production due to Nonconforming Product Samples or other factors out of MFT's control.

It is Buyer's responsibility to supply an adequate amount of acceptable quality test product pursuant to ¶ 6.2 below. MFT bears no responsibility if Buyer fails to provide Product Samples to MFT.

6.1.2 Phase Two Acceptance Testing. After completion of delivery of the System, assembly, and training at the place-of-delivery, MFT personnel will conduct a second test to confirm the System's performance ("Phase Two Acceptance Testing"). The Phase Two Acceptance Testing will be conducted using the same Product Samples and performance criteria specified for the Phase One Testing. If the Phase One performance criteria are met during the Phase Two Acceptance Testing, the Parties agree that the System shall be deemed accepted.

6.2 Acceptance of All Other Goods. For any other goods that are not subject to paragraphs 6.1.1 – 6.1.2, Buyer will have ten (10) days after receipt to reject nonconforming goods before such goods are deemed accepted by Buyer.

6.3 Product Samples. Seller requires Buyer to supply Product Samples to MFT prior to MFT's submission of a Proposal to Buyer, and in sufficient quantities to (a) evaluate Product Samples for consistency in structure and form, and (b) design the System Specifications to process the Product Samples provided. The projected System performance, as presented in the Proposal, is valid only for Product Samples provided to Seller prior to the date of the Proposal.

Buyer must also supply to Seller actual Product Samples to the same specification as those provided prior to the MFT Proposal, so that MFT may conduct Acceptance Testing of the System, as set forth above in paragraphs 6.1.1-6.1.2. MFT will estimate and advise Buyer of the quantity of Product Samples MFT requires. If not otherwise specified by MFT, MFT requires a stack of each Product Sample, approximately 25 inches high, for testing any System that is composed of feeders. If automatic product loaders are to be tested, a minimum of 5,000 samples are required. Product Samples should be shipped at Buyer's cost to Seller no later than ten (10) days after Seller's acceptance of Buyer's Order. Product Samples will not be returned. Seller does not guarantee feeding performance of any specific product unless an exact Product Sample has been tested before delivery of the System to Buyer.

LIMITED WARRANTY AND LIMITATION OF LIABILITY

To activate the warranty, Buyer must sign and return to MFT (a) the Proposal and (b) fully completed warranty registration cards, which Buyer will receive with the System.

Seller warrants to Buyer, for a period of one year from the date of delivery of the System to Buyer or for 2000 operating hours, whichever occurs first, that the System or Accessory Product(s) will be free from defects in material and workmanship. An extension of this Limited Warranty is available for an additional charge. OTHER THAN THE FOREGOING, NO WARRANTY OR GUARANTEE, WHETHER STATUTORY, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR ANY PURPOSE IS MADE. THE EXPRESS WARRANTY SET FORTH HEREIN SHALL BE THE SOLE AND EXCLUSIVE

REMEDY BY THE BUYER HEREUNDER FOR ANY SYSTEM OR ACCESSORY PRODUCTS DELIVERED TO THE BUYER WHICH ARE FOUND TO BE DEFECTIVE IN ANY MANNER, WHETHER SUCH REMEDIES BE IN CONTRACT, TORT, STRICT LIABILITY, OR BY LAW. OTHER THAN AS SET FORTH HEREIN, SELLER SHALL UNDER NO CIRCUMSTANCE BE DIRECTLY OR INDIRECTLY LIABLE FOR ANY LOSS OR DAMAGE HOWSOEVER ARISING FROM SUCH MERCHANDISE, INCLUDING LOST USE, LOST PRODUCT, LOST REVENUE, LOST PROFITS, COST OF CAPITAL, OR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES.

If during the warranty period, the System or an Accessory Product fails to meet the Specifications, Buyer shall notify in writing of the specific nature of the failure and all-pertinent observations related to the failure.

Seller does not represent or warrant that Systems or Accessory Products sold by it complies with OSHA or any like state, local, or national law or regulation, and the cost of modification and responsibility for such compliance is imposed upon Buyer. Equipment must be used in a non-condensing, low-humidity, dry environment, unless explicitly exempted by MFT in writing.

THE TOTAL CUMULATIVE LIABILITY OF SELLER TO BUYER FOR ANY CLAIM OF ANY KIND, FOR ANY LOSS OR DAMAGE WHATSOEVER ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE SALE OR SERVICING OF THE PRODUCTS HEREIN, SHALL NOT EXCEED THE PURCHASE PRICE OF THE SYSTEM OR ACCESSORY PRODUCT. BUYER AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS SELLER FROM ALL CLAIMS ARISING IN WHOLE OR IN PART ON ACCOUNT OF IMPROPER USE, ABUSE, MISUSE, USE NOT IN ACCORDANCE WITH SELLER'S RECOMMENDATIONS SET FORTH IN THE OPERATION, MAINTENANCE AND SYSTEM MANUALS SUPPLIED BY SELLER, OR BUYER'S FAILURE TO PERFORM UNDER THIS AGREEMENT.

Warranty coverage excludes cost of delivery to and from Seller's Minnesota facility. All units that the customer wishes to have repaired under warranty shall be accompanied by a MFT issued Returned Material Authorization (RMA) and must be sent to Multifeeder at Buyer's expense. A service fee of $500.00 will be charged for products sent to Seller for warranty repair, which are found to comply with the Specifications. Seller reserves the right to suspend any and all warranties if the Buyer has a delinquent account.

The System and Accessory Products are sensitive. To qualify for the warranty set forth in this Agreement, the System and Accessory Products warranted must be repaired by knowledgeable and specially trained MFT personnel only. Accordingly, warranty coverage will be void in its entirety upon any sign or evidence of (a) opening the System or field service conducted by individuals other than Seller's authorized personnel, (b) tampering or any kind of misuse of the System including Buyer's use of belts, *Stripper Wheels* or other parts not supplied by Seller, or (c) abuse of the System or Accessory Products. Non-warranty work will be completed according to Seller's standard rates and charges in effect at the time.

7. Confidentiality. Buyer acknowledges that Seller's technology is confidential and agrees not to disclose or utilize for its own commercial benefit any technology that Buyer learns through the purchase or use of the Systems and/or Accessory Products. In no manner does this Agreement imply or authorize any form of technology license to Buyer for any portion of Seller's technology except for Buyer's use of the System and Accessory Products for their intended purpose.

8. Export Controls. Buyer agrees that it will not, without obtaining prior authorization from the U.S. Department of Commerce:

(i) export or re-export, directly or indirectly, any technical data or products (as defined by the U.S. Export Administration Regulations) received by Buyer under this Agreement to destinations restricted or prohibited by U.S. law;

(ii) disclose such technical data to destinations restricted or prohibited by U.S. law; or

(iii) export or re-export, directly or indirectly, any direct product resulting from the technical data received by Buyer to destinations restricted or prohibited by U.S. law.

Buyer hereby agrees to indemnify, defend and hold harmless Seller for any export, re-export or disclosure in violation of U.S. law that results directly or indirectly from Buyer's actions.

10. Patents. Seller warrants that it has utilized reasonable efforts to ensure that the System and/or Accessory Products do not infringe on any patented technology belonging to any other person or entity. If infringement is found and Buyer's use of the System, Subsystem and/or Accessory Products is restricted, Seller will, at its option, either (a) redesign the System, Subsystem, and/or Accessory Products to avoid the infringement; (b) seek a license to allow the current technology to be utilized by Seller; or (c) allow Buyer to return the System, Subsystem and/or Accessory Products for a full refund.

11. Choice of Law.

11.1 Governing Law. The laws of the State of Minnesota, United States of America and any applicable Federal laws of the United States of America, as from time to time amended and in effect, govern all matters arising out of or relating to this Agreement, including without limitation its validity, interpretation, construction, performance (including the details of performance), and enforcement. The Parties agree that any applicable conflict of law provision that results in the application of the laws of a foreign jurisdiction shall be disregarded. Buyer and Seller expressly agree that neither this Agreement, nor any ancillary agreement, undertaking, or performance that may be promised, performed, or executed to implement this Agreement will not be subject to or interpreted by the United Nations Convention on Contracts for International Sale of Goods.

11.2 Foreign Corrupt Practices Act of 1977. Buyer is subject to the laws and regulations of the Foreign Corrupt Practices Act of 1977 (FCPA), Title 15 United States Code Service section 78dd-1 and its progeny.

11.3 Prohibition on Flowdown Provisions. In no event will this Agreement be subject to any other contract which would subject Seller to any additional terms and conditions or liability. Buyer bears all liability for all other contracts to which Buyer is subject.

12. Forum Selection Clause. Buyer and Seller agree that all disputes, claims, controversies and disagreements relating to or arising out of this Agreement are subject to the exclusive jurisdiction and venue of the state and federal courts of Minnesota, of the United States of America. Buyer waives any objections to jurisdiction or venue in any proceeding before any such court in Minnesota and hereby submits to the exclusive jurisdiction of any such court in Minnesota. Buyer and Seller agree that the exclusive choice of forum set forth in this section does not prohibit the enforcement of any judgment obtained in that forum or any other forum.

13. Miscellaneous.

13.1 Governing Language. The English language of this Agreement shall govern and control any translations of the Agreement into any other language. Documents furnished by Buyer to Seller under the terms of this Agreement shall be furnished in English or accompanied by an English translation. Seller will not be held responsible for errors or misunderstandings that may occur due to omissions or translations to another language. Seller reserves the right to correct all errors.

13.2 Assignment. This Agreement shall be binding upon and shall inure to the benefit of Buyer and Seller and their respective successors and assigns, ***provided, however,*** that Buyer may not assign its rights or delegate its duties under this Agreement without Seller's prior written consent, which may be granted or withheld at Seller's sole discretion.

Buyer and its assignees and/or transferees of the System and/or Accessory Products, including all associated proprietary and intellectual property rights, agree to the terms and conditions of the Agreement. Buyer agrees to indemnify, defend and hold harmless Seller for any claim or loss or damage suffered as a result of any assignee or transferee failing to abide by these terms and conditions.

13.3 Counterparts. This Agreement may be executed in multiple identical counterparts, all of which taken together constitute a single agreement.

13.4 Entire Agreement. This Agreement and any exhibits attached hereto, including Multifeeder Technology, Inc. General System Default Specifications (Exhibit A), constitute the entire agreement and understanding between Buyer and Seller. All prior written or oral agreements, undertakings, promises, warranties, or covenants relating to any subject matter not expressly set forth within this Agreement are hereby superseded.

13.5 Amendments and Waivers. No inconsistent, additional or modified terms or conditions, including price, will apply unless specifically agreed to in a writing signed by Buyer and Seller. No waiver of any provision or condition shall be valid unless set forth in a writing signed by the waiving party.

13.6 Force Majeure. Whether foreseen or unforeseen, Seller will not be liable for any failure, defect in performance, delay in the performance of orders or in the delivery of goods, or for any damages arising from events beyond Seller's reasonable control, including without limitation, acts of Buyer, acts of God, accidents, fires, floods, acts of insurrection or war, governmental interference, embargo, delays by the shipper, strikes, labor disturbances, unavailability or shortage of supplies or raw materials, unforeseen absence of transportation capabilities or rescheduled, postponed or cancelled transportation arrangements, changes due to export controls or the ability to obtain an export license, or any other like cause.

13.7 Limit of Time to Bring Action. No actions or arbitrations arising out of this Agreement may be brought by Buyer more than eighteen (18) months after the occurrence of the event giving rise to such action or arbitration.

13.8 Attorneys Fees. Seller will be entitled to recover reasonable attorneys' fees and costs in any proceeding to enforce payment from Buyer.

13.9 Buyer's right to use all of Seller's products, systems and materials are conditioned upon Buyer's acceptance of these Terms and Conditions.

EXHIBIT A: MULTIFEEDER TECHNOLOGY, INC.

GENERAL SYSTEM DEFAULT SPECIFICATIONS

1.0 SCOPE. The scope of these Default Specifications is to define the equipment configuration and performance requirements for the Custom Multifeeder Technology, Inc. System (hereinafter "System"). All definitions set forth under the MFT Terms and Conditions apply to these Default Specifications.

2.0 APPLICABLE DOCUMENTS.

National Electric Code 1993

3.0 DEFAULT SPECIFICATIONS. The System shall be configured as specified herein (the "Default Specifications"), unless more specifically defined in the applicable Proposal. To the extent that any of the Default Specifications specified here are varied by the Proposal submitted to Buyer, for the purposes of creating custom-designed product-specific or application-specific requirements, those specifications that are specially varied will apply. Other than to the extent specifically varied in the Proposal, the Default Specifications apply.

3.1 POWER REQUIREMENTS. Each Subsystem will have 110 VAC +/-10%, 50/60 HZ or 208 VAC +/- 10% 50/60 HZ single phase power available on a circuit capable of delivering 15 amps minimum per feed station. The power will be clean and free from power surges or power outages. The power, fusing, wiring and disconnects will be in accordance with the applicable requirements of the National Electrical Code, as updated.

3.2 ENVIRONMENTAL REQUIREMENTS.

3.2.1 TEMPERATURE REQUIREMENTS. The System will be maintained and operated in a location where the temperature range is maintained between 10 to 35 degrees Celsius (50 to 95 degrees Fahrenheit).

3.2.2 HUMIDITY REQUIREMENTS. The System will be maintained and operated in a non-condensing, dry location with a relative humidity range of 40 to 80%.

3.3 PRODUCT SAMPLE REQUIREMENTS. This System is a customized high technology system that depends upon strict quality standards and uniformity of Product Samples handled in order to achieve strict quality standards and uniformity of Final Product Throughput. By way of example and without limitation, the Product Samples to be fed and/or processed by the System will be uniform and free of defects, such as bent corners, dog ears, warpage, tears, bends, folds, debris, contamination, any other nonconforming factor that affects feeding and/or secondary processing, or any other nonconforming Product Sample Tolerances as defined below. Product Samples that do not fall within the Product Sample Tolerances set forth below or within the Proposal will be deemed "Nonconforming Product Samples."

3.3.1 PRODUCT SAMPLE TOLERANCES.

3.3.1.1 DIMENSIONAL TOLERANCE. The dimensional tolerance of any Product Sample will exhibit no more than a +/- 1/32 inch variance from the nominal values designated in Buyer's Proposal.

3.3.1.2 SQUARENESS TOLERANCE. The squareness tolerance of any Product Sample will exhibit no more than a +/- 1/32 inch variance from the nominal values designated in Buyer's Proposal.

3.3.1.3 THICKNESS TOLERANCE. The thickness of any Product Sample will exhibit no more than a +/-10% variance from the nominal values designated in Buyer's Proposal.

3.3.1.4 FLATNESS TOLERANCE. The maximum warpage or curl of any Product Sample will be less than +/- 1/16 inch when measured lying on a flat surface.

3.4 OPERATOR REQUIREMENTS. Due to the customized high-technology of this System, it is imperative that all users of the System ("operators") adopt and practice MFT-documented operating procedures to properly function. To ensure effective production, all equipment operators must (a) be properly trained by MFT-authorized personnel and (b) adhere at all times to the prescribed procedures set forth in the various Operation, Maintenance and System Manuals. All System Performance Specifications and Guarantees are conditioned upon the adherence of all operators to the above-mentioned requirements. By way of example without limitation, all operators must be capable of performing all equipment adjustments and product set-up procedures in accordance with the applicable Operation, Maintenance and System Manuals, and trained to properly load product into the *Feeder* magazines, perform *Feeder* parametric settings and to properly adjust photo-eyes and holding apparatuses.

3.5 RELIABILIY OF PRODUCT SAMPLES SUPPLIED TO MFT. In order to design and build a System that will assemble and/or process Final Product Throughput that is consistent in specification, the MFT System requires consistent Product Samples. In order to accomplish this goal, the performance projected within MFT's Proposal is valid only for (a) those Product Samples that pass MFT's factory testing prior to MFT's draft Proposal; and (b) those Product Samples that (1) conform to the MFT pre-proposal factory testing and (2) are provided to MFT prior to MFT's receipt of Buyer's Order and in sufficient quantities to perform testing prior to shipment of the equipment ("Phase One Acceptance Testing" Terms and Conditions paragraph 6.1.1).

3.6 PROCEDURES FOR ACTIVATING WARRANTY COVERAGE. The MFT General System Default Specifications incorporate the Limited Warranty set forth under Multifeeder Technology, Inc. Terms and Conditions. All warranties require the Buyer to return a signed copy of the signature page of the Proposal to Multifeeder Technology, Inc. to become effective.

3.6.1 EQUIPMENT WARRANTY. All applicable equipment warranties require the Buyer to return a fully completed warranty registration card to Multifeeder Technology, Inc. If the equipment requires return to MFT, the Buyer shall call MFT in advance and request a return material authorization number (RMA), which must be written on the outside of the shipping container.

3.6.2 PERFORMANCE WARRANTY. Upon request of the Buyer, Multifeeder Technology, Inc. will negotiate and price into its Proposal an efficiency level (parts per minute at a to-be-determined confidence level) for each type of Product Sample received by MFT, in sufficient quantities and with sufficient time to perform testing on the System, provided that such Product Samples are consistent and conforming. For purposes of calculating an efficiency level, all lost time or lost production due to Nonconforming Product Samples or factors out of MFT's control shall be subtracted from the production uptime, and product changeover time is excluded.

To qualify for any applicable performance warranty the Buyer agrees to comply with the following:

a) The System will be completely installed by qualified MFT personnel and all operators will be properly trained by qualified MFT personnel;

b) Buyer will notify MFT in writing of any deficiencies observed in the System's performance with sufficient detail to assist MFT in determining the source of the reported problem;

c) Product Samples are in compliance with the Product Sample requirements and tolerances specified herein; and

d) Upon proper notification of any problem, MFT will have 30 days to repair, replace, or arrange a partial or complete refund in exchange for returning the defective equipment. The amount of refund will depend upon the problem, equipment condition upon return, and the assignment of responsibility. The amount of any refund will be within the sole discretion of Multifeeder Technology, Inc

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