KNOWLEDGE BASE

Article Type: **Instructions**

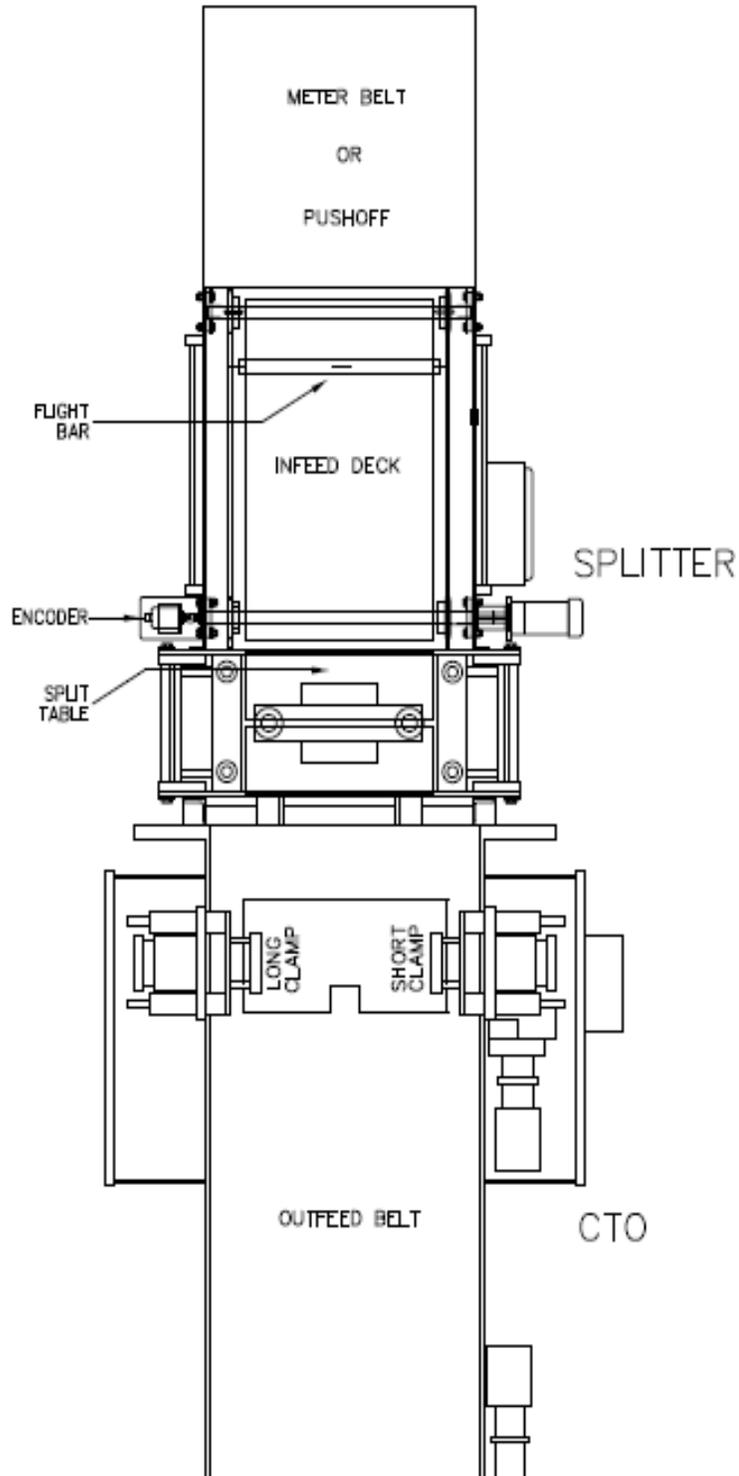# 1224 Splitter and CTO combo, setup instructions using the Panelview 1000+ HMI

Description:

Instructions on "How to" properly setup the 1224 Splitter and CTO/Clamp Turnover combo that uses the Compact Logix PLC with Panelview 1000+.
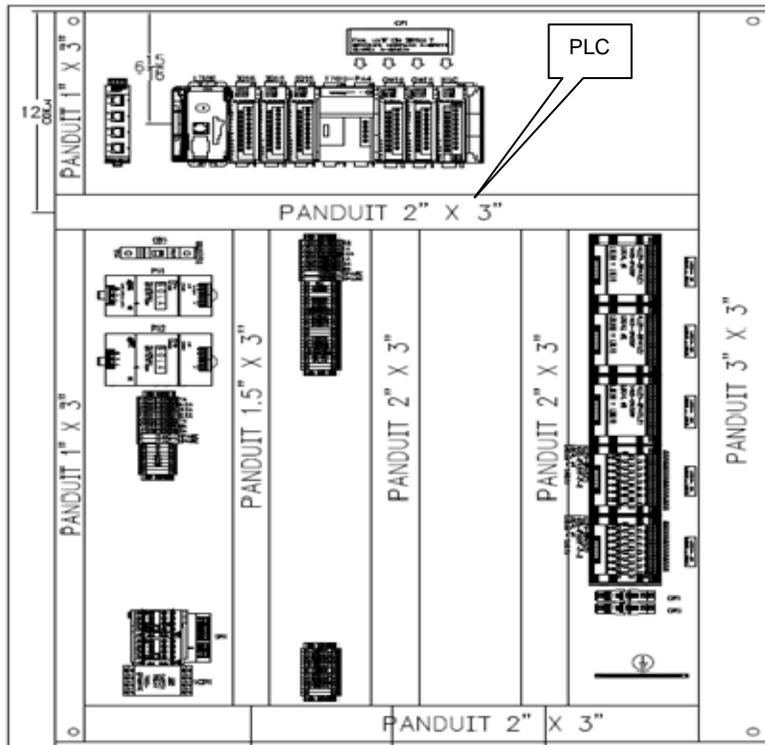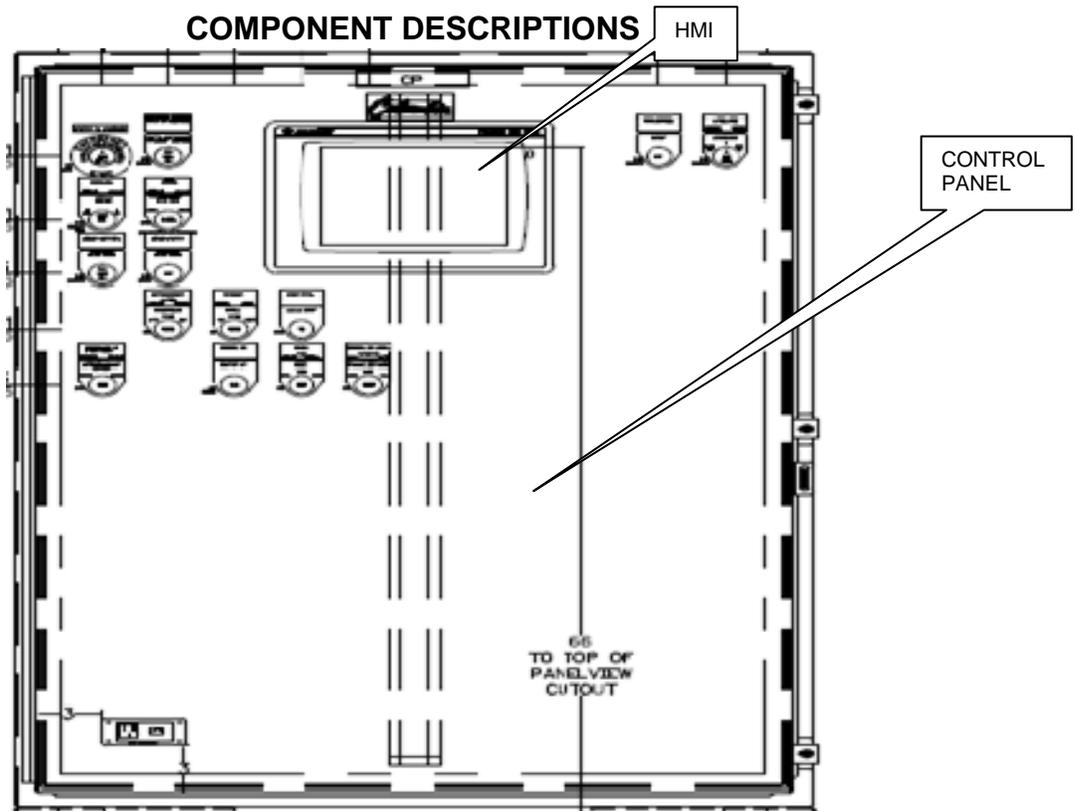
WARNING

Never work on, clean or service this unit, control panel or any machine or open or remove any protective cover, guard, grate, door, or maintenance panel until the power or energy sources has been turned off, locked out / tagged out, and all moving parts have come to a complete stop and or blocked to prevent movement. Machinery is dangerous – avoid personal injury and or death by following manufacture, Local, and OHSA safety procedures. Contact Columbia Machine for safety decals, guards, horns and beacons.

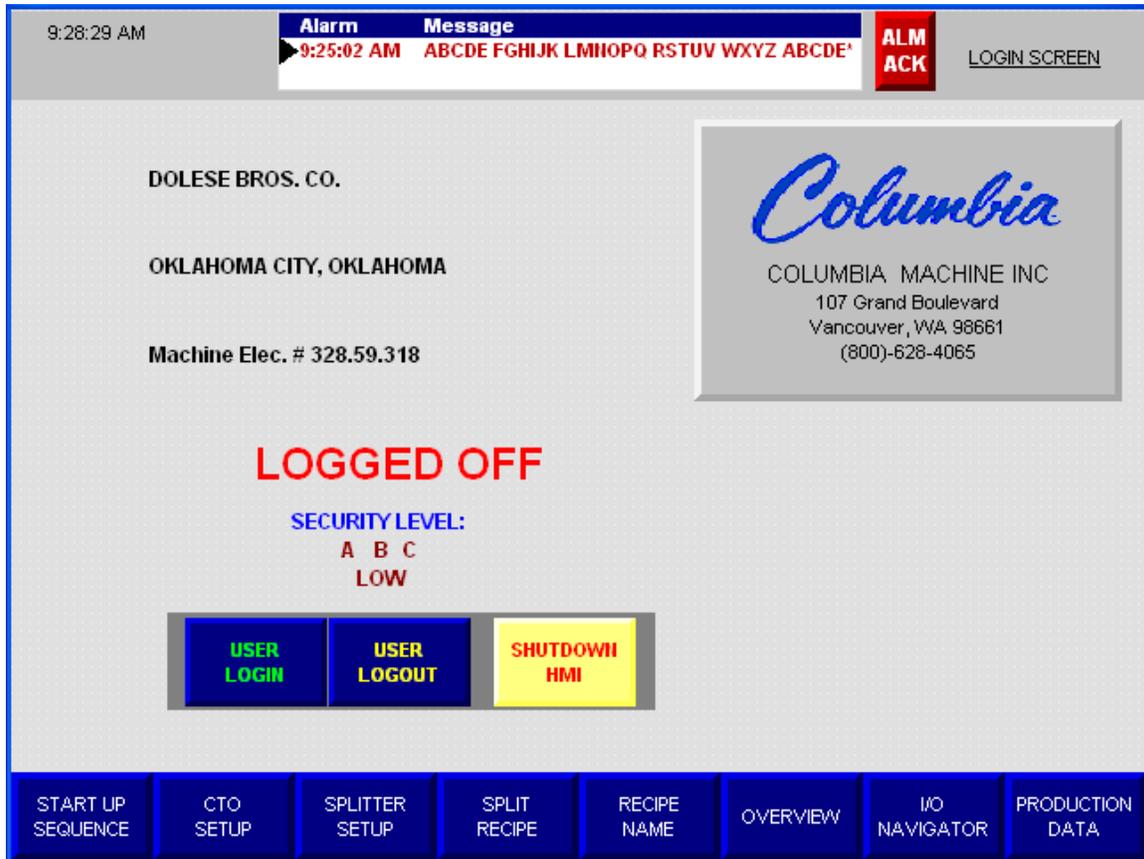# CTO/1224 SPLITTER MANUAL W/COMPACT LOGIX PLC

COMPONENT DESCRIPTIONS

METER BELT

OR

PUSHOFF

FLIGHT
BAR

INFEED DECK

SPLITTER

ENCODER

SPLIT
TABLE

LONG
CLAMP

SHORT
CLAMP

OUTFEED BELT

CTO

COMPONENT DESCRIPTIONS

HMI

CONTROL
PANEL

66
TO TOP OF
PANELVIEW
CUTOUT

PLC

PANDUIT 1" X 3"

PANDUIT 2" X 3"

PANDUIT 1" X 3"

PANDUIT 1.5" X 3"

PANDUIT 2" X 3"

PANDUIT 2" X 3"
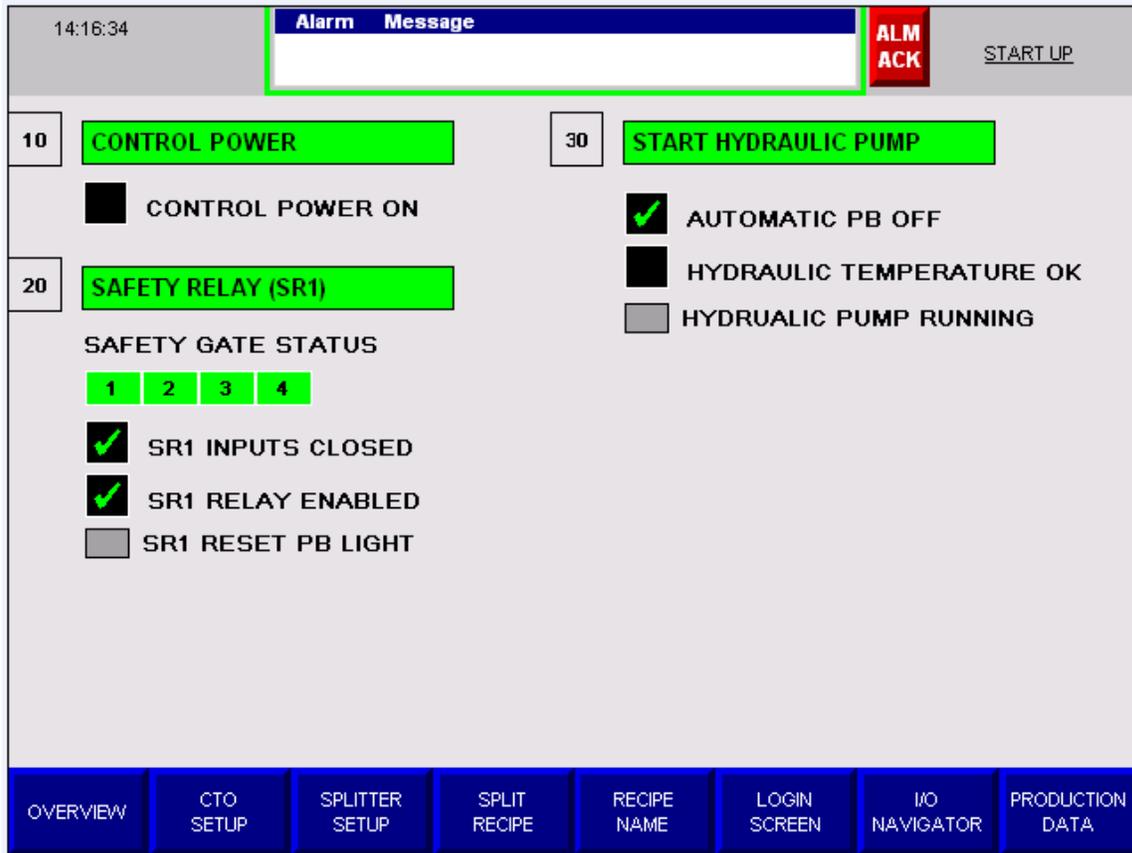
PANDUIT 3" X 3"

PANDUIT 2" X 3"

INTRODUCTION TO SPLITTER OPERATOR INTERFACE SCREENS

**CUSTOMER INFORMATION & SPLITTER LOGIN SCREEN**

USE LOGIN/LOGOUT: Allows personal with proper password access to Split Recipe editing.

SHUTDOWN HMI: Allows the operator to shut down the Splitter HMI program if Panel View system setup options need modified.

14:16:34

Alarm   Message

ALM ACK

10 CONTROL POWER

▢ CONTROL POWER ON

20 SAFETY RELAY (SR1)

SAFETY GATE STATUS

1 2 3 4

✓ SR1 INPUTS CLOSED

✓ SR1 RELAY ENABLED

▢ SR1 RESET PB LIGHT

30 START HYDRAULIC PUMP

✓ AUTOMATIC PB OFF

▢ HYDRAULIC TEMPERATURE OK

▢ HYDRUALIC PUMP RUNNING

OVERVIEW	CTO SETUP	SPLITTER SETUP	SPLIT RECIPE	RECIPE NAME	LOGIN SCREEN	I/O NAVIGATOR	PRODUCTION DATA

START UP SCREEN

This screen shows the conditions that must be satisfied in order to run the machine in Automatic Mode.
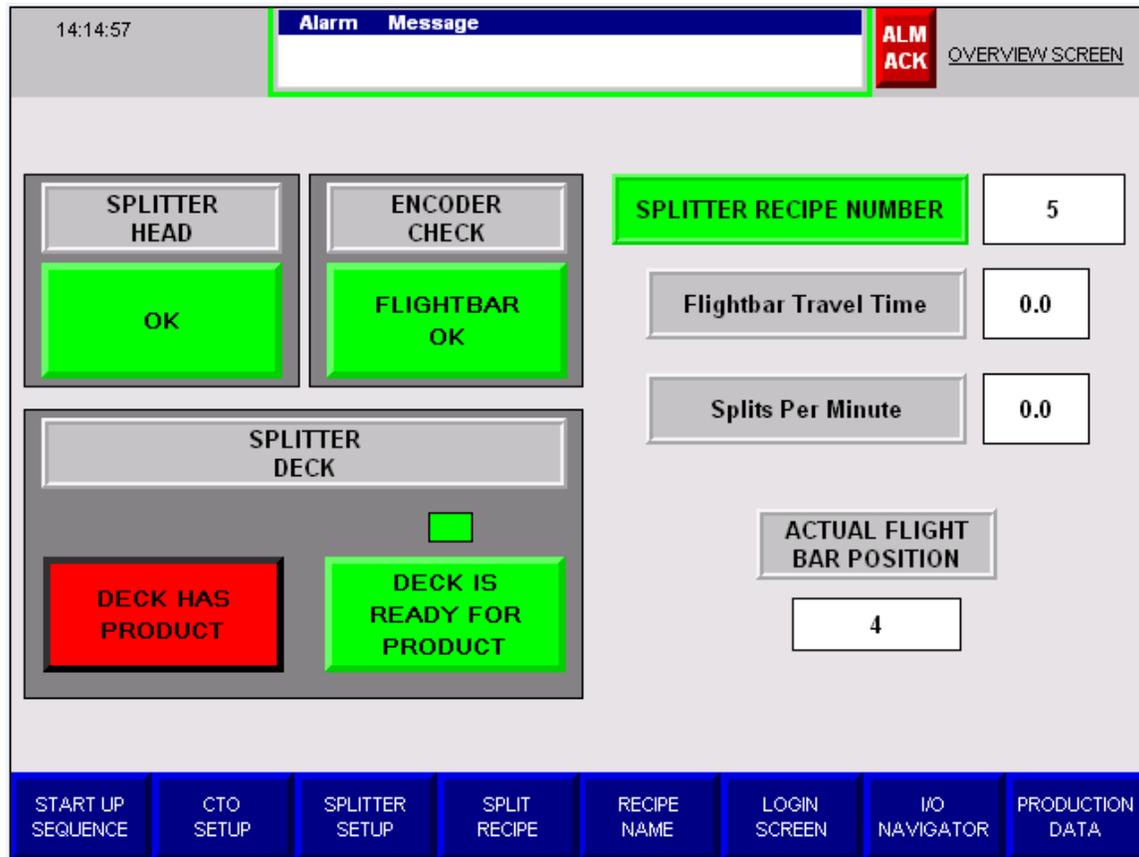
SPLITTER OVERVIEW SCREEN

This screen displays the current status of the splitter.

SPLITTER RECIPE NUMBER: Displays the number of the recipe currently being run.

FLIGHTBAR TRAVEL TIME: Displays the time it takes the Splitter to split a deck full of block. This time is measured from the time the Flight Bar leaves the Home Switch until it returns to the Home Switch while running in Automatic Mode.

SPLITS PER MINUTE: The value in this display is useful when adjusting split recipe parameters, giving immediate feedback as to whether adjustments being made are increasing or decreasing the time required to split product.

ACTUAL FLIGHT BAR POSITION: The amount of counts the Flight Bar has traveled from the Home Position Switch.

SPLITTER HEAD: Gives feedback regarding the Splitter Head Status. If this display gives a message "Check Head Down Switch" the PLC is seeing an input for both the Up and Down Switch at the same time. If this message is displayed check switch adjustment or check for switch failure.

ENCODER CHECK: This display gives a message "Flight Bar Not Moving" if the Flight Bar is given a command to move and no position change is received from the encoder by the PLC.

SPLITTER DECK: This display indicates what the PLC's program status is regarding the Splitter Deck. This information is useful when recovering from a fault. After a fault (product jam), before putting the machine back in Automatic Mode, always look at this display. If the display says "Deck is Ready For Product" but the Deck really isn't ready (empty) make corrections to avoid a crash between the product already on the Deck and the product that is about to be put on the Deck by the Pushoff or Meter Belt.

_____

PRODUCTION STATUS SCREEN

DAILY/SHIFT COUNT: The counter display that shows the total number of Splits done, regardless of which recipe has been run since it has been reset. This counter can be reset at any time.

TOTAL SPLIT COUNT: The counter display that shows the total number of Splits done with the current recipe being run. This counter is used to track Splitter Blade life.

SPLITTER SETUP SCREEN

OPTIONS:

BYPASS SPLIT KNIVES: This disables the splitter knives so product not requiring splits can be indexed thru the splitter.

FB WARM UP: This mode, when selected, allows the Splitter to operate in Automatic Mode without product. This can be used at the beginning of the shift to warm up oil or, after a delay in production during very cold weather, re-introduce warm oil into the Flight Bar hydraulic circuit.

TABLE DECEL OPTION: This option slows the Flight Bar as it dives down in front of the Split Table. Running this options keeps fragile product from being damaged by the Flight Bar is it dives down in front of the Split Table.

INFEED FOLLOW FLIGHTBAR OPTION: When enabled, this option allows the Pushoff or Meter Belt to bring product onto the Deck when the Flight Bar reaches "Infeed Follow FB Clear Position". With this option disabled the Pushoff or Meter Belt must wait until the Flight Bar reaches the Flight Bar Home Clear Of Infeed position before the Infeed Deck can be refilled with product. This option, when enabled, increases the Splits per Minute rate. The downside to this option is it takes close attention to match the Flight Bar forward speed to the Meter Belt or Pushoff forward speed. If the speeds aren't very closely matched product can be pushed into the Flight Bar.

INFEED TYPE, MB OR PUSHOFF: Indicator to show whether the splitter is configured for a Meter Belt Infeed, or a Pushoff infeed. This is a software configuration and cannot be changed by the operator.

INFEED MODE, FLIGHTBAR DISABLED: This option, when enabled, lets the Pushoff or Meter Belt index product thru the splitter without using the Flight Bar.

TIMERS:

PUSHOFF IS CLEAR OF FLIGHT BAR: An adjustable timer to determine when the Pushoff has retracted enough for the Flight Bar to move forward. *(Used only when a pushoff is the infeed device)*

DISCHARGE IS FULL: An adjustable timer used to determine when to shut down the Splitter after product has backed up into the discharge photocell.

INFEED INTERLOCK DISABLE: An adjustable timer used to determine when to shut down the conveyor-feeding product to the Meter Belt, after the Infeed Interlock Photocell has been blocked. *(Used only when a meter belt is the infeed device)*

METER BELT REVERSE TIME: An adjustable timer to determine how long the Meter Belt will reverse when the Flight Bar is full. This should be set to reverse just long enough to move the forward most product on the Meter Belt out of the way of the Flight Bar. *(Used only when a meterbelt is the infeed device)*

FLIGHT BAR DELAY FOR CLAMPS: An adjustable timer used to determine when to enable the Splitter Infeed Interlock CR1 after the CTO Clamp is off the Clamp Home Switch.

CTO SETUP SCREEN

CTO TURN AFTER SPLIT: When enabled this inhibits the Clamps from turning the product until the split is complete.

CTO CLAMP MODE:
RUN MODE = All product passes thru Clamps without being turned.
TURN MODE = All product is turned by Clamps.
R & T MODE = Product are turned and run as programmed in the Run and Turn Counters.

CLAMP FORWARD DELAY: This is the amount of time after the Clamps In Output is turned "On", before the Clamps Forward Output is turned "On". This delay gives the Clamps time to get a good hold on the product before turning it.

CLAMP IN DELAY: This is the amount of time after the Clamps Forward Output is turned "On", before the Clamps In Output is held "On". This delay determines how long before the product is released (Clamps Out) after the turn is started.

CTO TURN COUNT: This counter determines how many products are Turned, when the Run & Turn Mode is enabled.

CTO RUN COUNT: This counter determines how many product are Run (not turned), when the Run & Turn Mode is enabled.

| 14:31:26 | Alarm   Message | | ALM ACK | I/O NAVIGATOR |

| CPU | PB,SPLITTER | PX,SPLITTER | PB,PX,CTO |
| CPU SLOT 0 | INPUT SLOT 1 | INPUT SLOT 2 | INPUT SLOT 3 |

| SIG,PUMP,FB | HEAD,CTO |
| OUTPUT SLOT 4 | OUTPUT SLOT 5 |

| START UP SEQUENCE | CTO SETUP | SPLITTER SETUP | SPLIT RECIPE | RECIPE NAME | LOGIN SCREEN | OVERVIEW | PRODUCTION DATA |

I/O & PLC STATUS NAVIGATION SCREEN

PLC STATUS SCREEN

14:32:49		Alarm Message			ALM ACK	LOCAL #2 CONTROL PANEL

●: ON   ⬤: OFF

WIRE NUMBER

LOCAL #2 1769-IQ16

Signal	Wire Number	State	Address
SAFETY GATE #1 SIGNAL	L2I.00	⬤	LOCAL:2:I.DATA.00
SAFETY GATE #2 SIGNAL	L2I.01	⬤	LOCAL:2:I.DATA.01
SAFETY GATE #3 SIGNAL	L2I.02	⬤	LOCAL:2:I.DATA.02
SAFETY GATE #4 SIGNAL	L2I.03	⬤	LOCAL:2:I.DATA.03
MS-1 PUMP AUX.	L2I.04	⬤	LOCAL:2:I.DATA.04
MS-2 PUMP HEAT EXCHANGER AUX.	L2I.05	⬤	LOCAL:2:I.DATA.05
PUMP THERMOSTAT INPUT	L2I.06	⬤	LOCAL:2:I.DATA.06
PUMP OVERTEMP INPUT	L2I.07	⬤	LOCAL:2:I.DATA.07
INFEED INTERLOCK PC2	L2I.08	⬤	LOCAL:2:I.DATA.08
FLIGHT BAR HOME PX1	L2I.09	●	LOCAL:2:I.DATA.09
PRODUCT IN POSITION PC1	L2I.10	⬤	LOCAL:2:I.DATA.10
HEAD UP PX3	L2I.11	●	LOCAL:2:I.DATA.11
HEAD DOWN LS2	L2I.12	⬤	LOCAL:2:I.DATA.12
DISCHARGE INTERLOCK PC3	L2I.13	⬤	LOCAL:2:I.DATA.13
SPARE	L2I.14	⬤	LOCAL:2:I.DATA.14
SPARE	L2I:15	⬤	LOCAL:2:I.DATA.15

START UP SEQUENCE	CTO SETUP	SPLITTER SETUP	SPLIT RECIPE	RECIPE NAME	OVERVIEW	I/O NAVIGATOR	PRODUCTION DATA

TYPICAL INPUT STATUS SCREEN

INPUT STATUS: Input Status Screens are used to see input state when trouble shooting.

TYPICAL OUTPUT STATUS SCREEN

OUTPUT STATUS: Output Status Screens are used to see output state when trouble shooting.

RECIPE NAMING SCREEN

After entering new SETUP values, press here to permanently save the new data to the recipe selected

Press here to move values from recipe selected to the Setup Column

Select recipe #1 thru 40 here

After entering new RUNNING values, press here to make the new settings active

After entering new RUNNING values, press here to make the new settings active

29:09	Alarm	Message		ALM ACK	RECIPE SETUP

LOAD SETUP	SAVE SETUP	SPLITTER RECIPE NUMBER	5	LOAD RUNNING	SAVE RUNNING

	Setup	Storage	Running		Setup	Storage	Running
Number Of Splits	1	1	1	Split #1 Postion	3108	3108	3108
Flight Bar At Fast Position	60	60	60	Split #2 Position	0	0	0
Flight Bar Clear Of Infeed	3500	3500	3500	Split #3 Position	0	0	0
Flight Bar Split Cushion	125	125	125	Split #4 Position	0	0	0
Flight Bar Split Reverse	25	25	25	Split #5 Position	0	0	0
Start Table Decel Position	20	20	20	Split #6 Position	0	0	0
Stop Table Decel Position	15	15	15	Split #7 Position	0	0	0
Infeed Follow FB Clear Pos	3500	3500	3500	Split #8 Position	0	0	0

Recipe Name

4 inch splits

4 inch splits

RECIPE SETUP 2	OVERVIEW		ACTUAL FLIGHT BAR POSITION	4

RECIPE SETUP SCREEN

LOAD SETUP: Used to move the data from the Storage column into the "Setup" column. Moving the data into the "Setup" column allows the data to be edited.

SAVE SETUP: Used to permanently save the data in the "Setup" column to the recipe that has been selected for editing. When new values are saved the updated values now appear in the "Storage" Column.

SPLITTER RECIPE #: Used to select the recipe to be edited.

LOAD RUNNING: Used to move the data in the "Storage" column into the "Running" column. Moving the data into the "Running" column allows the data to be edited.

SAVE RUNNING: Used to save the data in the "Running" column to the recipe that has been selected for editing. When new values are saved, the updated values now appear in the "Storage" Column. The values in the "Running column are the values used when the Splitter is running in Automatic Mode.

NUMBER OF SPLITS: The number of splits required for an Infeed Deck full of product for the recipe selected.

FLIGHT BAR AT FAST POSITION: The position where the Flight Bar will transition from slow speed to fast speed after leaving the Home Switch.

Note: The purpose of this setting to assure the Flight Bar has always made contact with the product on the Infeed Deck before changing from slow to fast speed. If the Flight Bar is going fast when it makes contact with the product, the product or the Flight Bar can be damaged.

FLIGHT BAR CLEAR OF INFEED: The position where the Flight Bar has traveled far enough to allow the next group of product to be moved onto the Splitter Infeed Deck.

FLIGHT BAR SPLIT CUSHION: The distance before the split position the Flight Bar transitions from slow to fast speed. The ideal value is as short as possible yet is long enough that the Flight Bar doesn't stop faster than block does allowing the block to loose contact with the Flight Bar. This is important as the encoder only knows where the product is if it is touching the Flight Bar.

FLIGHT BAR SPLIT REVERSE: The distance the Flight bar will back-up after it stops for the split position. This value should be set just long enough to let the product separate during the split. Any longer than this and travel time is wasted going forward to position for the next split.

START TABLE DECEL POSITION: The distance from the Home Position Switch where the Flight Bar transitions from fast to slow speed before diving down below the Split Table so the Flight Bar doesn't damage fragile product when the Table Decel option is enabled.

STOP TABLE DECEL POSITION: The distance from the Home Position Switch where the Flight Bar transitions from slow to fast after completing the Table Decel travel.

SPLIT #1-8 POSITION: The position for each split (distance from Home Position).

ACTUAL FLIGHT BAR POSITION: The amount of counts the Flight Bar has traveled from the Home Position Switch.

RECIPE NAME: The field where a name can be given to the recipe being edited.
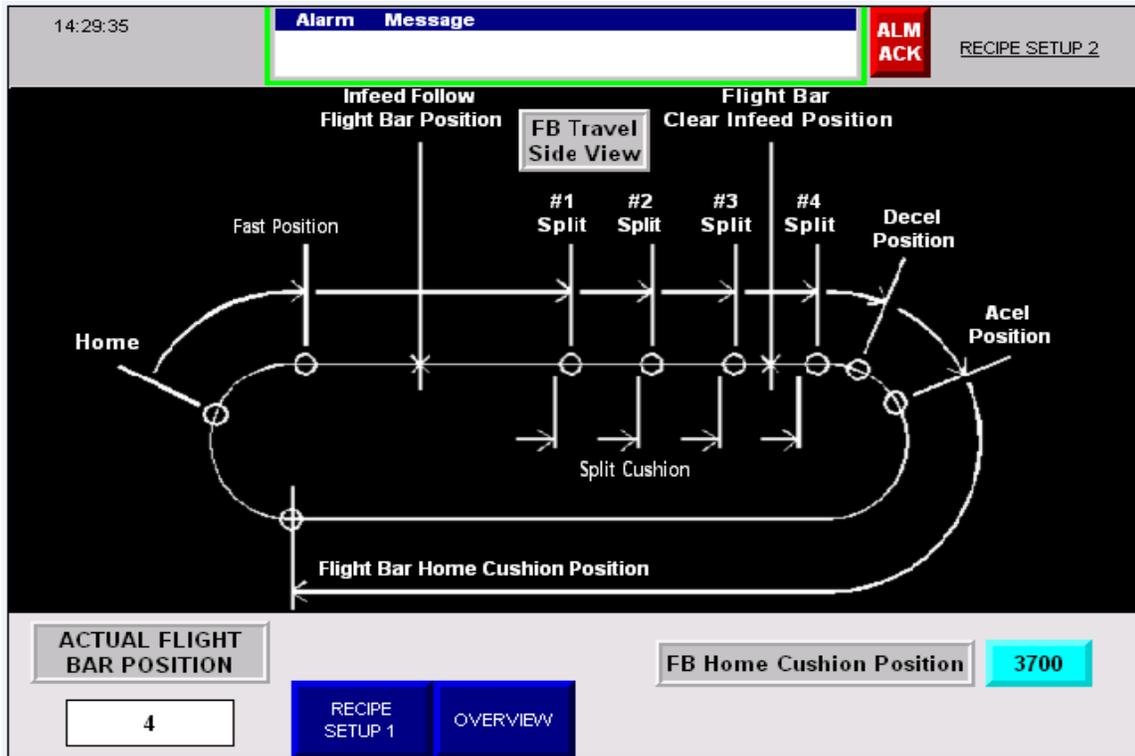
FLIGHT BAR HOME CUSHION: The distance before the home position that the Flight Bar changes from fast to slow speed. This is set as close as close to the Home Switch as possible so as to not waste cycle time but long enough to make sure the Flight Bar is travelling at slow speed when the Home Switch is made so the Flight Bar stops consistently at the same spot.

SPLITTER WITH ENCODER, PRODUCT SETUP ENTRY PROCEDURE

The 1224 Splitter is designed to split concrete product up to eight times. The 1224 Splitter can store 40 product setups for the operator to choose from. The operator must enter (program) each setup pattern. To enter a setup pattern the 1224 Splitter **must be in the Manual mode of operation**. A pencil and paper is useful for calculating the "Flight Bar Split Cushion".

NOTE: once the operator starts to enter the data into the system the operator must not change to another HMI screen until the setup is saved, or data already entered will be lost.

When a Numeric Input is touched the Numeric Keypad shown below appears for the entering new values. Numeric Inputs are found under the Setup and Running columns in Figure 1.

Displays new values being entered

Back Space Key

Press Enter Key to except new values

After entering new SETUP values, press here to permanently save the new data to the recipe selected

Press here to move values from recipe selected to the Running Column

Press here to move values from recipe selected to the Setup Column

Numeric Input for selecting recipes #1 thru 40 here

After entering new RUNNING values, press here to make the new settings active

9:09

Alarm   Message

AL ACK

RECIPE SE   1

LOAD SETUP	SAVE SETUP	SPLITTER RECIPE NUMBER	5	LOAD RUNNING	SAVE RUNNING

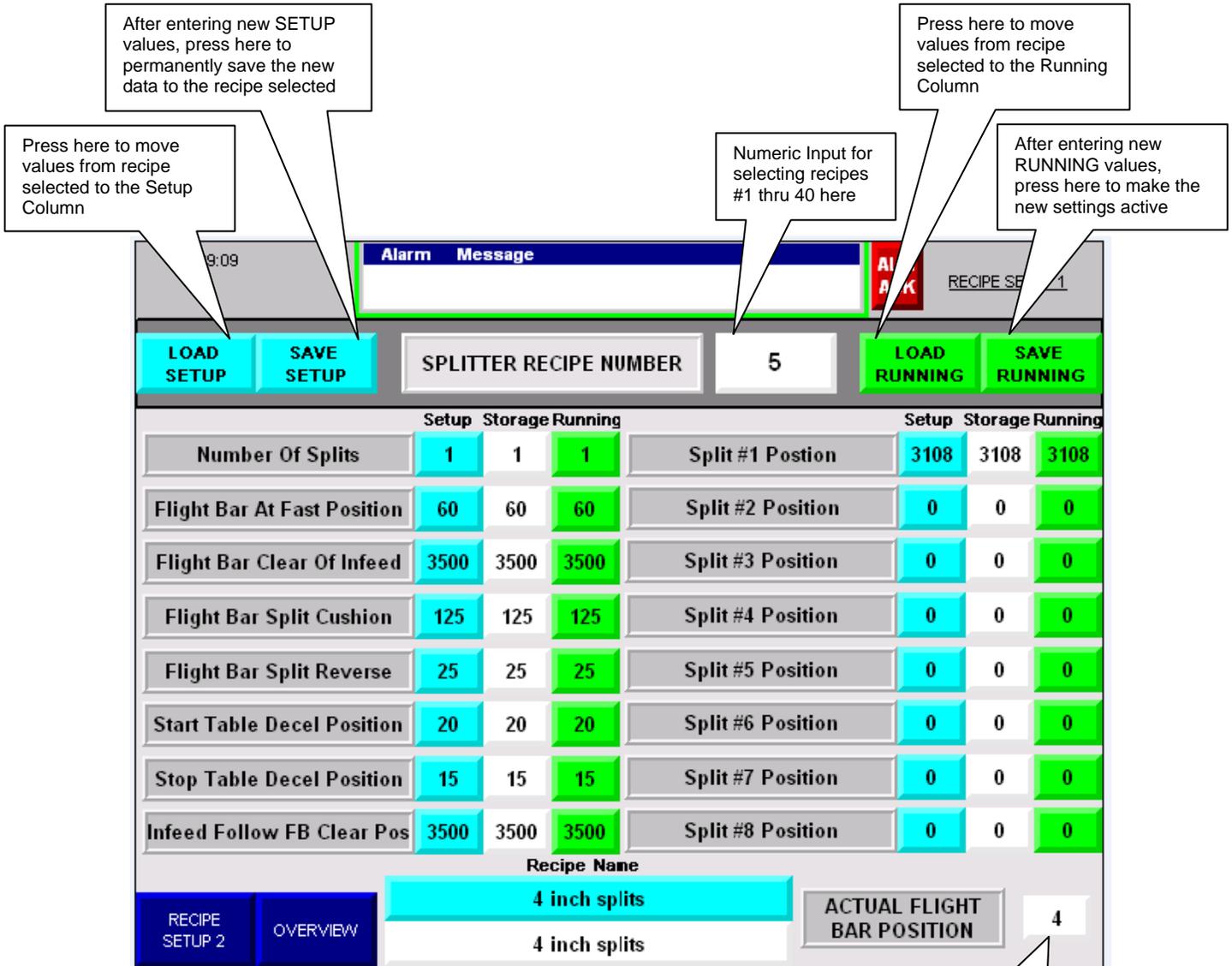|	Setup	Storage	Running		Setup	Storage	Running
Number Of Splits	1	1	1	Split #1 Postion	3108	3108	3108
Flight Bar At Fast Position	60	60	60	Split #2 Position	0	0	0
Flight Bar Clear Of Infeed	3500	3500	3500	Split #3 Position	0	0	0
Flight Bar Split Cushion	125	125	125	Split #4 Position	0	0	0
Flight Bar Split Reverse	25	25	25	Split #5 Position	0	0	0
Start Table Decel Position	20	20	20	Split #6 Position	0	0	0
Stop Table Decel Position	15	15	15	Split #7 Position	0	0	0
Infeed Follow FB Clear Pos	3500	3500	3500	Split #8 Position	0	0	0

Recipe Name

RECIPE SETUP 2	OVERVIEW	4 inch splits	ACTUAL FLIGHT BAR POSITION	4
		4 inch splits		

Figure 1

4D. Read the count here

1. Turn the Power Switch ON.

2. Push in the Auto Switch to turn the system into Manual Mode.

3. Start the hydraulic pump. Hydraulic pressure is needed to manually move the flight bar.

4. To determine "Flight Bar At Fast Position" value:

    A.   Use the Meter Belt or Pusher to move the product onto the Infeed Deck.
    B.   With the Product sitting on the Infeed Deck, mark on the Infeed Deck with soapstone where the front edge of the Product is. This mark will be used later to determine "Flight Bar Clear Of Infeed" position (step 10).
    C.   Manually move the Flight Bar from the Home Position forward until it touches the product placed on the Infeed Deck (the Flight Bar is at home when ACTUAL FLIGHT BAR POSITION = 0).
    D.   Then read the count from ACTUAL FLIGHT BAR POSITION. The count shown is the Flight Bar At Fast Position. Enter this value in the "Flight Bar At Fast Position" numeric input.

Note: The purpose of this setting to assure the Flight Bar has always made contact with the product before changing from slow to fast speed. If the Flight Bar is going fast when it contacts the product the product or the Flight Bar can be damaged.

5. Enter a value of 25 in the "FLIGHT BAR SPLIT REVERSE" numeric input as a starting value. Then adjust as required.

   Note: This value should be set just long enough to let the product separate during the split without hitting the Flight Bar with excess force. Any longer than this and Flight Bar travel time is wasted going forward to position for the next split.

6. Move the Flight Bar to a position about 2 or 3 inches before the product reaches the First Splitting Position. Then, write down the value in ACTUAL FLIGHTBAR POSITION display and call it Cushion Count.

7. Move Flight Bar so that the product reaches the First Splitting Position. Then read the value in the ACTUAL FLIGHTBAR POSITION display. Enter the value in the "SPLIT #1 POSITION" numeric input.

   Note: Depending on Flight Bar forward speed, the Split Positions count needed in the recipe may be a couple counts less than the actual split location because of the distance the Flight Bar travels during the slow speed to stop transition.

8. Now subtract the Cushion Count recorded on step 6 from SPLIT #1 POSITION. The result is the FLIGHTBAR SPLIT CUSHION. Enter the value in the "FLIGHTBAR SPLIT CUSHION" numeric input.

   Note: Thru trial and error it may be determined a smaller value can be used to increase split rate. The ideal value is as short as possible yet is long enough that the Flight Bar doesn't stop faster than block does allowing the block to loose contact with the Flight Bar. This is important as the encoder only knows where the product is if it is touching the Flight Bar.

9. Repeat step 7 for SPLIT POSITIONS #2-#8 as required.

10. At some point as the Flight Bar is move forward to find the split positions it will pass the soapstone mark on the Infeed Deck made that noted the front edge of the product after it had been moved onto the Infeed Deck. When the Flight Bar is just past the mark note the value in the ACTUAL FLIGHT BAR POSITION display. This value is to be entered in the "Flight Bar Clear Of Infeed" numeric input.

    CAUTION: Before putting the machine in Automatic Mode, verify that the Flight Bar is forward far enough that any product that is pushed or conveyed onto the Infeed Deck of the Splitter will not come into contact with the Flight Bar by moving product onto the Infeed Deck manually first. Failure to do this can result in damage to the Splitter flight bar and/or product.

11. After all split positions have been entered, and the Table Decel Option is required for the product used in the recipe being programmed, move the Flight Bar forward until just before it starts to dive down in front of the Split Table. Note the value in the ACTUAL FLIGHT BAR POSITION display. Enter that value shown in the "Start Table Decel Position" numeric input.

12. Now move the Flight Bar far enough forward to move the last product onto the Split Table. As the Flight Bar dives down and is no longer touching the product on the Split Table note the value in the ACTUAL FLIGHT BAR POSITION display. Enter that value shown in the "Stop Table Decel Position" numeric input.

TIPS FOR INCREASING SPLITS PER MINUTE

1. Set the Flight Bar fast position such that the Flight Bar has just touched the product. The longer the Flight Bar is in slow speed the slower the cycle time. But make sure that the Flight Bar is still in contact with the product before going fast.

2. Shorten the cushion before split such that the Flight Bar has slowed down just before the split position. DO NOT SPEED UP THE SLOW VALVE! By speeding up the slow valve the Flight Bar will coast before stopping. This will move the split position.

3. Set the cushion before home position as short as possible. This is not a critical value. Just make sure that the flight bar stops before interfering with the next set of blocks coming onto the Infeed Deck.

4. Keep the upper blade fairly close to the product to minimize the Head down travel time when making the split.

TROUBLE SHOOTING TIPS FOR CORRECTING POSITIONING ERROR

1. SPLIT OFF BY EQUAL AMOUNTS ON EACH SPLIT:
    This indicates a problem with the resetting of the encoder counts. This can be caused by Flight Bar traveling to fast past the home switch or Flight Bar home switch trip has moved.
    Suggestions:
    a)   Start decel to home position sooner
    b)   Re-adjust home switch position trip

2. SPLITS SHORT OF POSITION, RANDOM OCCURANCE:
    This can be caused by an increase in back pressure causing block to stop short as the block decels from slow to stop for split with *open loop positioning.
    Suggestions:
    a)   Decrease slow speed to reduce the error
    b)   Mount solid plate on splitter outfeed to increase back pressure or for splits above 30 per minute add a weighted plate.

3. SPLITS PAST POSITION, RANDOM OCCURANCE:
    Not enough back pressure on the block during decel to split position.
    a)   Mount solid plate on splitter outfeed to increase back pressure or for splits above 30 per minute add a weighted plate.

4. ALL OF THE ABOVE: One by one work your way through the above.

*This is a problem that is always present with an open loop positioning scheme because the position programmed for a split position is always a few counts less than the actual split position. This difference is basically an educated guess as to how far the block will travel during the transition from slow speed enabled to slow speed disabled.