

SOFTROL

Software & Control for Automation

Understanding the

AUTOPULSE

Automation

System

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The AutoPulse Automation System operates in a Negative and Positive direction. In a normal wash isle layout, (washes with dryers directly across the isle) you need to distinguish the appropriate direction. This is done by placing your back to the washers. To your immediate left is the Negative direction. To your immediate right is the Positive direction. Making a (90) ninety degree turn to your left (your left side facing the washers) to your immediate left is the Negative direction. To your immediate right is the Positive direction.

The shuttle is the mediator of the system. At all times it is looking for an invitation from either a washer or a dryer to be loaded or unloaded. If the shuttle is empty the front panel display will read, "Waiting for Command". All washers, dryers, and no-dry stations will have an assigned shuttle position that is programmed into each machine setups. When a washer is finished processing its load, depending on the type of unloading sequence that is programmed, it will send out an invitation to the C2 (BED A) shuttle that it is ready to be unloaded.

The shuttle will travel to its desired position, retract to the inviting washer, and wait for the washer to unload. The washer will open its door, tilt into the shuttle, and begin to unload. When the photo eye on the dryer end of the shuttle bed is broken, the shuttle is told that the washer is unloaded. While all of this is taking place the washer is transferring the information that it received from the BLMI or the Softrol PulseNet database on what was processed and how to dry the load. When the washer reaches its loading position depending on its loading system, the shuttle will start looking for an available dryer to dry the load.

If the washer is a shuttle-loaded system, the C1 (BED B) shuttle will position itself, load the washer, and then start looking for an available dryer to dry the load. If no dryer is available, the shuttle will go to its programmed home position and wait for the first available dryer that can accept the programmed item code. If a dryer is available, (available meaning tilted into the load position asking to receive a load) the shuttle will move to the dryer position, extend towards the dryer, the belt will start transferring the load and the dryer basket will start rotating to receive the load. During this time, the dry information and destination data is transferred. After the load is transferred into the dryer the belt will continue to transfer until the programmed time in the shuttle setups for declares belt emptied has been timed out.

The shuttle will then return to it's at travel position and start looking for another washer to unload and will restart this sequence. The dryer will return to the run position, close the door and run the desired dry formula that corresponds with the programmed item code. For No-dry/bypass conveyors, a dryer classification from 60 to 69 will allow all shuttles to respond. Dryer classifications 70 to 79 will allow only negative end shuttles to respond. Dryer classifications 80 to 89 will allow only positive shuttles to respond.

Node ID #

This is the Softrol AutoPulse ID that is unique to every machine connected to the network and must be a number from 1 - 255. The machine ID assignments should follow the following convention:

<u>Machine Type</u>	<u>Acceptable Node ID Numbers</u>
Wet Process	1-100
Dryers	101-200
Shuttles	201-210
Conveyors	211-249
Chemicals	211-249
PC's	250-255

There is an exception for a weighing conveyor in that this ID can also be set to zero (0), which is an indication to the conveyor control that it is not connected to a Softrol PulseNet network. This will allow the conveyor to be operated manually to load a shuttle. However, the Loading Conveyor was designed to be a part of the Softrol AutoPulse System and to operate as part of an automated system. There is no form of automatic operation at all without the Softrol PulseNet network and a valid Node ID of 1-255. If set to manual operation with a Node ID of zero (0), in the Stand By mode the conveyor will display "[YES] = Unload". When the [YES] key is pressed the conveyor will unload the first loaded pocket after the motion alarm has been sounded regardless of whether the shuttle is in place to receive it or not.

Washers

The washer extractors in a Softrol AutoPulse system are always equipped with the necessary options for automatic machine movement. The hardware/software is embodied in the two-way tilt and automatic door options. For Bag loaded systems, automatic chutes should be installed on the machines. Automatic chemical injection is usually considered for full automatic operation.

Washer AutoPulse Setups

To include a machine into an AutoPulse system all that is required is to install the ArcNet card, connect it to the Softrol PulseNet Network, and then answer the AutoPulse setups on the machine. These AutoPulse setups contain the important operation information necessary for proper operation of the AutoPulse. Each setup is detailed in the following:

ArcNet Node

To include a machine into an AutoPulse system answer YES. To exclude a machine from the AutoPulse system, answer NO. Sometimes it is necessary to exclude machines from the network to perform manual operations or maintenance on a machine.

LAN Member ID #

This is the ID number for the machine. This ID number must be unique for the Softrol PulseNet system that the machine is being attached to. Valid ID numbers are 1 to 254. ID number #255 is reserved for Softrol Plant Monitor Database (PPMM).

Loading Position

This is the position for a shuttle to load the washer extractor. Positions are numbered in a system from 0 to 32. Position 0 is always to the far left of the wash aisle facing the wash aisle from the washer's aspect. The rightmost position is determined for each system and is the last needed position to the far right of the wash aisle facing the wash aisle from the washer's aspect. For bag-loaded machines, the loading position is determined by the machine's position in the bag-loading queue. For instance, if three machines were to be accessed by one rail queue, then the loading positions would be 1, 2 and 3 respectively.

Unloading Positions

This is the position for a shuttle to unload the washer extractor. The unloading position setup follows the same rules as the loading position for shuttle loaded machines.

Machine Class Type

This is the class type of the machine. The valid range is 0 to 94. Certain machines may be equipped differently than other machines.

In addition, certain processes may be preferred in particular machines. This is accomplished through using the Class Type. When items to be processed are entered into the Softrol AutoPulse system, they are assigned a Class Type Number for the Wash Classification.

The corresponding items will be processed in a machine with a matching Class Number. Assigning a Machine Class Type 99 will prevent the machine from automatic operation and is useful when maintenance or testing is performed on a machine. On bag-loaded systems, the Machine Class Type corresponds to the Queue number of the rail system that will load the machine. In this case, if there are four different rail queues loading machines, then the machines will have either a Machine Class Type 1, 2, 3, or 4 respectively. All machines serviced by a rail queue must be capable of processing the same items.

On systems that do not have a database (PPMM or BLMI), or that it is manually loaded and automatically unloaded, this will need to be set to 91. Machine Class 91 means that the washer formula and the dryer formula correspond. For example, if the washer processes "Shop Towels" formula 45, the dryer must also be set up for Dry Class 91 and be programmed for "Shop Towels" at formula 45.

PLEASE NOTE: ON MANUALLY LOADED/AUTOMATICALLY UNLOADED SYSTEMS (MACHINE CLASS TYPE 91), FORMULAS 1 TO 99 WILL GO TO DRYER CLASS 91. FORMULAS 100 TO 128 AUTOMATICALLY GO TO DRYER CLASS 95 WHICH IS USUALLY A DRYER BY-PASS LOCATION. THE SHUTTLE SETUP FOR NO-DRY STATION 1 WILL NEED TO BE SET TO 95. THIS SETUP WILL ALSO CORRESPOND WITH THE CALIBRATED SHUTTLE POSITION FOR NO-DRY STA. 1/POS.

Sequence Priority #

The sequence priority establishes the manner in which machines are selected for loading and unloading. Machines with a sequence priority of zero will rotate priority according to how long the machines have been waiting to load or unload. Machines with a sequence priority greater than zero attain a higher priority of selection than those units with a sequence priority of zero. A sequence Priority of 1 is the highest priority. The available machine with the smallest non-zero priority will be selected preferentially. Machines with the same priority will be handled in a shortest path algorithm, meaning that the machine closest to the current position of the shuttle or the first machine in a rail queue will be handled first.

Minimum Weight

This establishes the minimum weight that a machine will accept for a load.

Maximum Weight

This establishes the maximum weight that a machine will accept for a load.

Lo Formula Range 1

This establishes the minimum formula number for a formula range 1 that a machine will accept for a load. Three acceptable ranges can be established.

Hi Formula Range 1

This establishes the maximum formula number for formula range 1 that a machine will accept for a load.

Lo Formula Range 2

This establishes the minimum formula number for formula range 2 that a machine will accept for a load.

Hi Formula Range 2

This establishes the maximum formula number for formula range 2 that a machine will accept for a load.

Lo Formula Range 3

This establishes the minimum formula number for formula range 3 that a machine will accept for a load.

Hi Formula Range 3

This establishes the maximum formula number for formula range 3 that a machine will accept for a load.

Interference Pos. Lo

This establishes the first position for a machine where the automatic movements of the machine's door and/or chutes have a mechanical interference potential with shuttles. If the system has been designed without mechanical interference's, this setup may be programmed to 0. PLEASE NOTE: THE INTERFERENCE POS. MUST BE A POSITION IN WHICH THERE IS NO MECHANICAL INTERFERENCE OF THE MACHINE'S DOOR AND/OR CHUTES WITH THE SHUTTLE.

Interference Pos. Hi

This establishes the last position for a machine where the automatic movements of the machine's door and/or chutes have a mechanical interference potential with shuttles. If the system has been designed without mechanical interference's, this setup may be programmed to 0. If the positive stop position is equal to a machine's Interference Position Hi, program 64 for this setup. PLEASE NOTE: THE INTERFERENCE POS. MUST BE A POSITION IN WHICH THERE IS NO MECHANICAL INTERFERENCE OF THE MACHINE'S DOOR AND/OR CHUTES WITH THE SHUTTLE.

Loading Height

This establishes the height that a scissors shuttle should be positioned at to load the machine. A height of 0 is the lowest height and a height of 99 is the highest height. If the system does not utilize a scissors shuttle, this setup may be programmed to 0.

Loading Depth

This establishes the depth that a scissors shuttle should be positioned at to load the machine. A depth of 0 is the depth of the shuttle when positioned at the shuttle's southern limit. Depth may increase to a maximum of 99. Depth's greater than the shuttle's middle limit establish positioning towards the shuttle's northern limit. If the system does not utilize a scissors shuttle, this setup may be programmed to 0.

Unloading Height

This establishes the height that a scissors shuttle should be positioned at to load the machine. A height of 0 is the lowest height and a height of 99 is the highest height. If the system does not utilize a scissors shuttle, this setup may be programmed to 0.

On machines with a chute door loading system there are four (4) settings that will change the pattern when unloading onto a shuttle.

Unload Height = 0

Machine, when unloading and at the run position, will start opening the door and then tilt to the unload position.

Unload Height = 97

Machine, when unloading and at run position, will open the door until the door open sensor is on then tilt to the unload position.

Unload Height = 98

Machine, when unloading will not begin to open the door until at the unload position.

Unload Height = 99

Machine, when unloading will begin to open the door once the run position sensor turns off.

Unloading Depth

This establishes the depth that a scissors shuttle should be positioned at to unload the machine. A depth of 0 is the depth of the shuttle when positioned at the shuttle's southern limit. Depth may increase to maximum of 99. Depth's greater than the shuttle's middle limit establish positioning towards the shuttle's northern limit. If the system does not utilize a scissors shuttle, this setup may be programmed to 0.

IF A WASHER IS LOCATED TO THE NORTHERN LIMIT (DRYER SIDE) OF THE WASH ISLE, THIS SETTING MUST BE SET AT 99. IF THE SYSTEM DOES NOT UTILIZE A SCISSORS SHUTTLE, THIS SETUP MAY BE PROGRAMMED TO 0.

AutoPulse Automatic Operation

When the system enters automatic operation, the washers may move unexpectedly at any time. The LED displays will begin flashing once a second indicating that the washer and the system are in automatic mode. Automatic mode will only be entered if all local machine safeties are proven on the machine. Automatic mode may be suspended on a machine for one minute by pressing a key on the keypad. Automatic mode may be suspended on a machine indefinitely by pressing the emergency stop button. After all safeties are returned to the proven position, the machine will enter automatic mode in one minute. Automatic mode may also be suspended on a machine by assigning it Machine Class Type 99. The machine may be operated manually without the machine

entering into automatic mode. In order to prevent the shuttle from loading a washer with two loads, the Softrol AutoPulse system does not consider a washer to be empty until it has moved to the rear up unloading position and the door is opened. If manual intervention prevents a washer from reaching the unloading position after the termination of a formula, then the operator may inform the Softrol AutoPulse system that the washer is empty by pressing the [CLR] and [ENT] keys simultaneously after the washer displays the "Waiting for Washer to Receive Load" message. This procedure may also be used if a washer is in automatic mode (LED displays blinking) and "Waiting for Washer to Receive Load" is displayed but the shuttle never loads the washer.

NOTE: IF THIS IS SEQUENCE IS PERFORMED PREMATURELY WHILE A MACHINE IS STILL LOADED, THE SOFTROL PLANT MONITOR DATABASE WILL ASSUME THE MACHINE IS READY TO RECEIVE A LOAD AND CAN BE LOADED.

For Shuttle Loaded Washers

The shuttle can be loaded two ways, either by an automatic loading conveyor or by an operator. Loading the shuttle with an automatic loading conveyor is all done automatically and is covered in the Pocket Loader section. For an operator loading system, the operator can request to load either by pressing the Request Load button on the podium, or by pressing the [ENT] and the [NO] keys simultaneously On the shuttle. This will prompt the shuttle to travel to its programmed load position for loading. When at the position, the shuttle will retract for loading. While the operator is loading the shuttle, pressing the UP arrow will advance the belt. After the operator has loaded the shuttle, the following information will be prompted.

1 = Wash Process Data:

Selects washer process data for entry

Group # =: Key in Wash Group

Formula # =: Key in Wash Formula

2 = Process Data:

Selects dryer process data for entry

Group # =: Key in Dryer Group

Formula # =: Key in Dryer Formula

3 = Specific Data:

Selects item specific data for entry

Item #: Key in Item Number

Lot #: Key in Lot Number

Customer #: Key in Customer Number

Count: Key in Item Count

Weight: Key in Item Weight

Destination: Key in Post. Dest.

When a washer extractor is empty, it will attempt to sequence to the front tilted up, door open position to wait for a load. It does this by first tilting to the load position. The door

is then checked to see if it is open. If the door is required to open, the washer will wait until the shuttle(s) are at a position of rest. When the shuttle(s) have stopped moving, the machine will check its interference position range and determine whether it is safe to open the door.

If it cannot open the door, the machine will wait until the shuttle(s) are at the home position, where there are no mechanical interference's.

The door will then open, completing the necessary sequence to prepare for loading. If the system has been designed with no mechanical interference's, then the doors on the machines will operate without regard to the position of the shuttle(s).

When a washer is in the front tilted up, door open position waiting for a load, it will respond to a shuttle when a shuttle is looking for a washer to load.

If the washer is selected for load, the respective shuttle will position itself according to the washer's loading position and initiate the load sequence.

The washer will begin to rotate in balance speed. The shuttle will then extend to the washer and index the loading conveyor until the load is in the washer. The shuttle will then retract away from the washer and send the washer the necessary processing information for the load.

Once the shuttle(s) have returned to a position of rest, the door will close automatically. On systems designed without mechanical interference's, the door will close immediately after loading. Once the door is closed, the machine will return to the horizontal position and begin execution of the selected formula automatically.

When the wash formula is completed, the washer will return to the front tilted up position. When tilted up, it will wait for the shuttle(s) to be at a position of rest and then automatically open the door to prepare for unloading. On systems designed without mechanical interference's, the door will open immediately.

Once the washer is tilted up with the door open, it is available for unloading onto a shuttle and will respond to a shuttle's request to unload washers. If the washer is selected for unload, the respective shuttle will position itself according to the washer's unloading position and initiate the unloading sequence. The shuttle will first retract to the washer. The washer will then return to the horizontal position and then continue to the rear up unloading position. Once this position is achieved, the washer will begin the automatic unloading sequence.

The rotation of the cylinder during unload is described by the last formula executed. The shuttle will index the unloading belt to accept the load from the washer. The photo-eye on the shuttle will indicate when a load has been put on the shuttle.

When a washer is in the front tilted up, door open position waiting for a load, it will respond to a shuttle when a shuttle is looking for a washer to load.

If the washer is selected for load, the respective shuttle will position itself according to the washer's loading position and initiate the load sequence.

For Bag Loaded Washers

When a washer extractor is empty, it will attempt to sequence to the front titled up, door closed, chute door open position to wait for a load.

On systems with mechanical interference's, the washer extractor does this by first returning to the horizontal position. The door is then checked to see if it is closed. If the door is required to close, the washer will wait until the shuttle(s) are at a position of rest.

When the shuttle(s) have stopped moving, the machine will check its interference position range and determine whether is safe to close the door. If it cannot close the door, the machine will wait until the shuttle(s) are at the home position, where there are no mechanical interference's. The door will then close. After closing the door, the machine will attempt to sequence to the load position. Once the machine is at the load position, the door will be opened, completing the sequence.

If the system has been designed with no mechanical interference's, then the doors and the chutes on the machines will operate without regard to the position of the shuttle(s).

When a washer extractor is in the ready to load state, it will respond to a Softrol Plant Monitor Database requesting a load.

If the washer is selected for load, the PPMM will signal the bag system to sequence the loading process. The PPMM will send the washer the necessary processing information for the load.

The bag will position itself according to the washer's loading position in the bag queue and initiate the load sequence. The washer will begin to rotate in balance speed and command that chute water be added during loading.

The bag will then automatically open and load the washer. The washer will respond by closing the door to see if the bag fully entered into the machine. If the loading chute is clear (indicated by the door closed switch) the door opens to prepare for the next bag. If more than one bag is to be loaded, the bag system will sequence through the remaining bags to be loaded. When all of the bags have been loaded into the washer, the bag system signals the loading interface that the loading sequence is over. Once the loading sequence has ended, the washer will close it's door and the machine will return to the horizontal run position and execute the selected wash formula automatically.

When the wash formula is completed, the washer extractor is available for unloading onto a shuttle and will respond to a shuttle's request to unload washers. If the washer is selected for unload, the respective shuttle will position itself according to the washer's unloading position and initiate the unloading sequence.

The shuttle will first retract to the washer. The washer will then begin to open up its door. When the door has been sensed open for 5 seconds, the washer will begin to tilt the rear up to the unloading position while continuing to open the door to the door open position.

Once this position is achieved, the washer extractor will begin the automatic unloading sequence. The rotation of the cylinder described by the last formula executed. The shuttle will index the unloading belt to accept the load from the washer. The photo-eye on the shuttle will indicate when a load has been put on the shuttle. The shuttle will then extend away from the washer. The washer will then proceed to the horizontal position door closed position. The washer will begin closing of the door one second after titling begins. When the washer is at the horizontal position, the machine will tilt back to the loading position, ending the unloading process.

Dryers

The dryers in an AutoPulse Automation System are always equipped with the necessary options for automatic machine movement. This usually is embodied in the two doors, front tilt options. Proximity sensors for all machine positions are strongly suggested.

As with the washers, the ArcNet communications card is also necessary. The coaxial cable connecting this card to the Plant Monitor network is the only required inter-machine connections. The Plant Monitor network communicates all the necessary information for automatic operation of the system. No complex wiring system is employed.

Dryer Softrol AutoPulse Setups

To include a machine into a Softrol AutoPulse system all that is required is to install the ArcNet card, connect it to the PPMM Network, and then answer the AutoPulse setups on the machine. These AutoPulse setups contain the important operation information necessary for proper operation of the AutoPulse. The setups for the dryer are similar as for the washer. Please see the setups as detailed in the washer section for explanation of each setup. In place of the Interference Lo and Interference Hi setups, the dryer prompts the following setups:

Belt System

This setup determines whether the dryer will be unloading onto a shared flat belt conveyor (East/West type) and/or a shuttle belt system. If the dryer is to unload automatically onto a flat belt conveyor, answer YES. When unloading onto a flat belt conveyor, unloading position indicates which direction to run the belt when unloading the dryer. If the dryer is to unload automatically onto a scissors shuttle, answer YES.

Idle At Load Position

This setup determines whether the dryer will be positioned at the horizontal rest position with doors closed or the accept load position when waiting for a load from the shuttle. In some climates, it is preferable to have the dryer waiting in the horizontal door closed position to prevent cold and/or hot air from entering into climate-controlled environments. If the dryer is to sequence to the Load Position At Idle, answer YES. Otherwise, answer NO.

AutoPulse Automatic Dryer Operation

When a dryer is empty, it will be in the horizontal position, with doors closed. If Idle At Load Position is selected, the dryer will be in the loading position with the load door open.

If the dryer does not have a belt interface, it must be put into the loading position by the operator on the unload side of the dryer after unloading of the dryer is successful. This is accomplished by commanding the dryer to move horizontal and closing the unload door from the unload side of the dryer. If the dryer does have a belt interface, it will position itself in the loading position automatically.

In order to prevent the shuttle from loading a dryer with two loads, the AutoPulse system does not consider a dryer to be empty until it has moved to the unloading position and the discharge door is opened.

If manual intervention prevents a dryer from reaching the unloading position after the termination of a formula, then the operator may inform the AutoPulse system that a dryer is empty by pressing the [CLR] and [ENT] keys simultaneously after the dryer displays the "Waiting for Dryer to Receive Load" message.

This procedure may also be used if a dryer is in automatic mode (LED displays blinking) and "Waiting for Dryer to Receive Load" is displayed but is never loaded by the shuttle.

When a dryer is in the waiting for a load position, it will respond to a shuttle when a shuttle is looking for a dryer to load. If the dryer is selected for load, the respective shuttle will position itself according to the dryer's loading position and initiate the load sequence.

The dryer will tilt to the loading position, open the dryer load door, and begin to rotate in the forward direction. If Idle At Load Position is selected, the dryer will already be in the loading position.

The shuttle will then extend to the dryer and index the loading conveyor until the load is in the dryer. The shuttle will then retract away from the dryer and send the dryer the necessary processing information for the load. The dryer will then close its load door and return to the horizontal run position and begin execution of the selected dry code automatically.

At the conclusion of the drying process, the dryer will check the unloading conveyor or Belt Interface to see if it can accept a load. If the conveyor or Flat Belt can accept a load, the dryer will open the discharge door and tilt to the unload position. Automatic unloading will begin if selected in the dryer formula. Automatic unloading is not desirable when unloading onto carts.

When the dryer is unloaded, the operator must put the dryer back into operation by returning the dryer to the horizontal position and closing the unload door from the control panel on the back of the dryer.

On some units, a push-button is provided on the unloading sort conveyor for remote operation. When a dryer unloads onto a shared Softrol AutoPulse Belt Interface, the dryer will return to service automatically. When the dryer is put in the horizontal position with the doors closed, the AutoPulse Data Record is sent to the PPMM database computer. The database computer optionally prints out the AutoPulse tracking sheet and/or enters the AutoPulse Data Record into the tracking database. The dryer then begins the sequence over again.

Shuttles

The shuttles in an AutoPulse system are always the main interface for the automatic loading and unloading of the machinery. The shuttle system incorporates all the necessary safety limits to determine if the system is in a safe posture for automatic operation. When all safeties are simultaneously enabled, a safety-reset procedure may be performed to enter into automatic operation. Interruption of any one of these safeties results in the exit from automatic operation.

A coordinate system must be established before setting up a shuttle system. The shuttle system may have up to 64 positions or coordinates defined for loading, unloading, and idle positions. These positions are always numbered from left to right, facing the wash aisle from the washer's perspective.

Therefore the far-left position is always position 0. The far right position can be up to position 64. Each position in the system is defined by installing a metal object in the floor (such as a metal washer) at each desired stop position for the shuttle system to sense. Metal flat bars installed in the floor define the far left and right positions.

On scissors shuttles, the coordinate system is extended to include height and depth of the conveyor beds. Height is established as being 0 when the scissors bed is all the way in the down position. Depth is established as being 0 when the scissors bed is retracted all the way to the South extent (viewed from the above perspective). Photo-eye establishes the height and depth by "counting" the relative movement of the beds.

Once the number of positions has been established the "Set Up Shuttle" procedure may be performed.

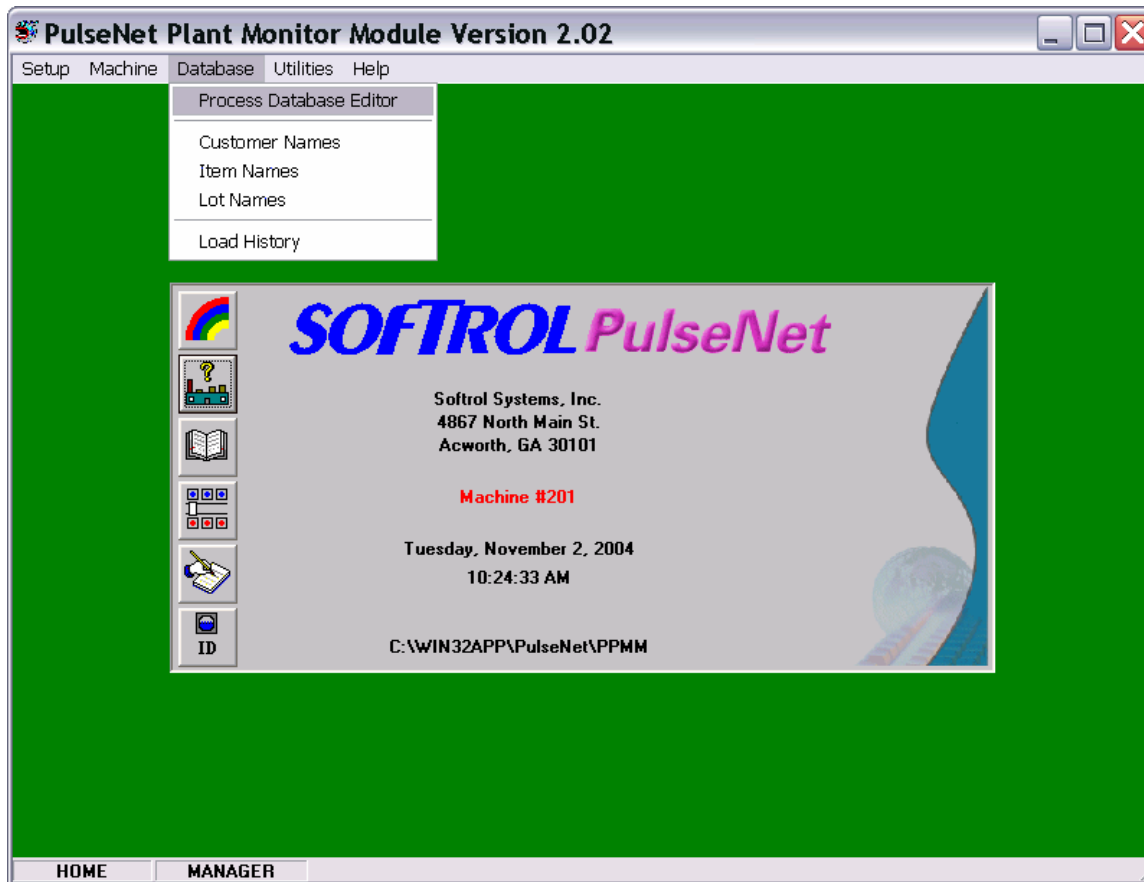


The sling system starts with the loading of the slings at the elevator. As each sling is loaded, an item code is assigned to it along with the weight of the sling. For example: Mats are assigned to item code 4 at 180 pounds. This is the most important part of the first operation. **IF THE WRONG ITEM CODE IS ENTERED, THE WASHERS, SHUTTLE, DRYERS, AND UNLOAD CONVEYORS COULD PROCESS THE WRONG FORMULA ETC.** This code will follow each sling through the system until it is emptied. The assigning of the item code will be covered in the next session.

The loaded slings will go to a predetermined rail i.e., R1, R2, etc., to wait in a preloading area for an available wash buffer zone i.e., B1, B2, or B3, that is compatible to wash the desired item number entered. The sling will go to the desired buffer zone and await further instructions.

The PulseNet Automation Loading Module (PALM) works along with the PulseNet Plant Monitor Module (PPMM) program in sharing the same database. The database will be programmed in the PPMM program with item codes that contain crucial data for the entire process.

To setup the database, please refer to your PPMM manual found inside your program under the Help menu.



The database needs to be programmed by the user prior to starting the system (Initial setup of the automated system).

Process Database Editor

Item	Description
1	Dirty Stuff
2	Really Dirty Stuff
3	Partially Dirty Stuff
4	Shirts
5	Pants

Description: Dirty Stuff

Item: 1

Lot: 12

Count: 565

Desired Weight A: 800

Desired Weight B: 450

Weight Tolerance: 25

Wash Class: 1

Wash Formula: 98

Dry Class: 2

Dry Formula: 24

Customer: 6

Destination: 1

Load Belt (Washer/Dryer)

On: 99

Off: 1

First Extension

Water

Off

Belt

Always

Unload Belt (Washer)

Delay: 8

On: 8

Off: 2

Eye Block: 1

Loading (Dryer)

Dryer Reverse Delay

Reading Database

Valid Records

All Records

Print Tickets

Print All

CSV

- | | |
|-----------------------|-----------------|
| 1- Description | 8- Wash Class |
| 2- Item | 9- Wash Formula |
| 3- Lot [AKA Day Code] | 10- Dry Class |
| 4- Count | 11- Dry Formula |
| 5- Desired Weight A | 12- Customer |
| 6- Desired Weight B | 13- Destination |
| 7- Weight Tolerance | |

Description

Description is a way of tracking the goods throughout the system.

Item

This number that is assigned to each sling that is to be processed. It is recommended that each different product have a different item code i.e., Mats item code 4 and Shop Towels item code 8.

Lot

Lot is a way for the user to track goods throughout the system.

Count

If you are processing 520 pieces, this number will be added to the data record. This data follows the load through the process and is shown on the process report.

Desired Weight A

This is the desired weight of the formulation that you wish to process. If your ideal load size is 800 pounds, this will need to be programmed **800**.

Desired Weight B

This is used only if there are two weighing devices i.e. weighing conveyors and is programmed identical to the prior.

Weight Tolerance

This is programmable to make your operation more efficient and to correspond with your formulation chemistry. If your desired weight is 500 pounds and you do not want to process over 525 pounds or fewer than 475 pounds this number would be **25**.

Wash Class

This is the class type of the machine. The valid range is 0 to 94. Certain machines may be equipped differently than other machines. In addition, certain processes may be preferred in particular machines. This is accomplished through using the Class Type. When items to be processed are entered into the system, they are assigned a Class Type Number for the Wash Classification. The corresponding items will be processed in a machine with a matching Class Number. Assigning a Machine Class Type 99 will prevent the machine from automatic operation and is useful when maintenance or testing is performed on a machine. On bag-loaded systems, the Machine Class Type corresponds to the Queue number of the rail system that will load the machine. In this case, if there are four different rail queues loading machines, then the machines will have either a Machine Class Type 1, 2, 3, or 4 respectively. All machines serviced by a rail queue must be capable of processing the same items.

Wash Formula

This is the formulation number that is assigned to the product that you are processing.

Dry Class

This is the class type of the machine. The valid range is 0 to 94. Certain machines may be equipped differently than other machines. In addition, certain processes may be preferred in particular machines. This is accomplished through using the Class Type. When items to be processed are entered into the system, they are assigned a Class Type Number for the Dry Classification. The corresponding items will be processed in a machine with a matching Class Number. Assigning a Machine Class Type 99 will prevent the machine from automatic operation and is useful when maintenance or testing is performed on a machine.

Dry Formula

This is the formulation number that is assigned to the product that you are processing.

Customer

Customer is a way for the user to track goods throughout the system.

Destination

Destination is a setup to tell the dryer unloading conveyor where to take the load for sorting. For example if you have a sort station on both ends of the dryer unload conveyor, you program this number to correspond with the negative or the positive end of the belt. **(See *post process range for dryer unloading belts.*)**

Loading/Unloading Parameters**Washer-Load Belt (*Only Valid on Non-Sling Loaded Systems*)**

On - This tells the shuttle loading the washer, (***soil shuttle***) how long to pause the indexing of the belt while the washer.

Off - This tells the shuttle how long to turn the belt off during the indexing.

- **First Extension** - If checked, this tells the shuttle to use the first extend into the washer input until the discharge photo-eye shows clear then extend into the second extend to washer input.

Water

Off – This tells the washer not to turn on the load flush output while loading.

Belt – This tells the washer to turn on the load flush output only while the shuttle belt is indexing and to turn off the load flush output when the belt is not indexing. This will also tell the washer to turn off the load flush output when the photo-eye at the discharge end of the shuttle shows clear.

Always – This tells the washer to turn on the load flush output at all times while being loaded.

Washer-Unload Belt

Belt Delay - This tells the unloading washer shuttle (clean shuttle) how long to pause the indexing of the belt while the washer is unloading.

On - This tells the clean shuttle how long to keep the belt turning while indexing the load.

Off - This tells the clean shuttle how long to turn the belt off during the indexing.

Eye Block - This tells the shuttle how long to leave the belt turning before recognizing the eye has been blocked.

For example: If you want the clean shuttle to unload from a washer a load of mats pausing 8 seconds before starting the indexing, then to turn for 8 seconds and turn off for 2 seconds and ignore the photo eye for 1 seconds, this will be programmed as **08, 08, 02,01**.

Dryer-Loading

Dryer Reverse Delay - This is a setup that can delay the rotation of the basket while receiving a load from the shuttle to help prevent roping on some goods.

- Print Tickets** – By checking this box, PPMM will print a ticket with all corresponding loads. Please refer to the PPMM manual for setup.

If the item code is programmed with the information needed, the PALM will look at what is in each buffer, review the item code for the loads that are in the buffer, and look for an available washer. Available; meaning tilted to the load position with the washer door opened, all safeties are met and asking to receive a load. If a washer is available the PALM will tell the sling loading system that it has a machine available for processing. The sling loading system will then start sending the slings to the available washer. The washer will start rotating and filling with water depending on the manufacturers setups. At this time the PALM will transfer the wash and weight data to the washer. After all of the desired slings are loaded and all safety photo eyes on the return rail have been made, the

rail system will tell the PALM that it is ok to start the machine. The machine will then close the washer door and begin tilting to the run position.

Once the run position is made, the machine will start the formula corresponding to the programmed item code.

Following you will find an example of a PALM module.

	Mach	Ready	Load	Item	Lot	Cust	Weight	BError	Clear	PLoad	Drop	MError	State	Legend	Resp	Reset
1	1	0	1	2	588	0	924	0	0	0	0	0	10	Running Formula	11	1
2	2	0	1	14	73	0	1523	0	0	1	1	0	5	Waiting for 'Bag Clear True'	5	2
3	3	0	1	1	586	0	666	0	0	0	0	0	11	Waiting to Unload	23	3
4	4	0	0	18	501	0	1080	0	0	0	0	0	10	Running Formula	11	4
5	5	0	0	3	501	0	714	0	0	0	0	0	10	Running Formula	11	5
6	6	0	1	20	20	0	930	0	0	0	0	0	10	Running Formula	11	6
7	7	0	1	33	72	0	1184	0	0	0	0	0	10	Running Formula	11	7
8	8	0	0	61	86	0	548	0	0	0	0	0	10	Running Formula	11	8
9	9	0	1	14	73	0	1260	0	0	0	0	0	2	Waiting For Empty Washer	0	9
10	10	0	1	40	73	0	1064	0	0	0	0	0	10	Running Formula	11	10
11	11	0	1	34	75	0	1440	0	0	0	0	0	11	Waiting to Unload	23	11
12	12	0	0	48	76	0	801	0	0	0	0	0	10	Running Formula	12	12
13	13	0	0	2	586	0	912	0	0	0	0	0	10	Running Formula	11	13
14	14	0	1	34	75	0	1457	0	0	0	0	0	10	Running Formula	11	14
15	15	0	0	10	588	0	1092	0	0	0	0	0	10	Running Formula	11	15
16	16	0	1	10	588	0	1008	0	0	0	0	0	11	Waiting to Unload	23	16

The PALM interface will have to be configured as well. To do this, click the System tab and you can review the following:

- Configure Plant Location
- Configure Ports
- Configure Machine Drops
- Configure Shuttle Drops
- System Defaults
- Printer Setup
- Site Management
- Disable Unload Queue
- Exit

By selecting **Configure Plan Location** you can enter the plant name, address and the Plant ID number.

Configure Plant Location

Plant Name: Softrol Systems Inc.

Address: 4867 Niorth Main Street

City/State/Zip: Acworth, GA 30101

Plant ID #: 1

By selecting **Configure Ports** you can setup the ArcNet communications for the AutoPulse system by setting up the ArcNet Type, total number of networks, PC Identification number, and the I/O Address of the ArcNet card installed into the PC.

Configure Ports

Communication Mode

- Serial
- ArcNet Type 1
- ArcNet Type 2

Network

- #1
- #2
- #3
- #4

Total
1
2
3
4

ArcNet

PC ID #: 254

IO Address: DE10

Offset: D000

Serial

- COM1
- COM2
- COM3
- COM4

By selecting **Configure Machine/Shuttle Drops** you can setup the Dynamic Data Exchange (DDE) with the rail system provider.




Configure Machine Drops

Drop Point

Drop Enabled

Drop 1
 Drop 2
 Drop 3
 Drop 4
 Drop 5
 Drop 6
 Drop 7
 Drop 8
 Drop 9
 Drop 10
 Drop 11
 Drop 12
 Drop 13
 Drop 14
 Drop 15
 Drop 16

Machine ID 1 **Network** 1
Unload Position 0 **Queue Number** 1
Machine Ready R3C2
Load Present R5C2
Item R8C2
Lot R1C2
Customer R7C2
Weight R6C2
Bag Error R2C2
Bag Clear R9C2
PreLoad R10C2
Load Drop R4C2
Machine Error R11C2
Machine State R12C2

By selecting the **System Defaults** you can enter the default configurations for the DDE link server name, application name, and the database location.

System Defaults

System Parameters

Auto-Start

Force Periodic DDE Updates

Server Name
\\RAILPRO2

DDE Application Name
excellsheet1

Process Database FileName
c:\ppmm\home.sit\procdata.db

Mode

Machine Shuttle

Machine

Chute Door Close Timer 3

Chute Door Open Timer 3

Chute Door Drop Delay Timer 0

Startup Delay Timer 0

Shuttle

Drop	Auto	Pos	Pref Shuttle	Allow Xover	Belt Secs/Bag
1	<input type="checkbox"/>			<input type="checkbox"/>	
2	<input type="checkbox"/>			<input type="checkbox"/>	
3	<input type="checkbox"/>			<input type="checkbox"/>	

Belt ID

Link Items

Miscellaneous

Language
ENG
ESP
FRA

Metric System

Bold Font

Error Log

The **Disable Unload Queue** setup is used in conjunction with the Monorail Manufacturer and Softrol Systems Inc. This setup should never be altered unless instructed by Softrol.

Following you will find an example of a BLMI interface module. The setup is very similar to the PALM module.

Softrol BLMI - AutoPulse Interface														
System Edit Help														
Bag Drop Interfaces														
Mach	Ready	Load	Item	Lot	Cust	Weight	BError	Clear	PLoad	Drop	MError	State	Resp	Reset
1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6	0	0	0	0	0	0	0	0	0	0	0	0	0	6
7	0	0	0	0	0	0	0	0	0	0	0	0	0	7
8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
9	0	0	0	0	0	0	0	0	0	0	0	0	0	9
10	0	0	0	0	0	0	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	0	0	0	0	0	0	15
16	0	0	0	0	0	0	0	0	0	0	0	0	0	16

The BLMI interface will have to be configured as well. To do this, click the System tab and you can review the following:

- System Configuration
- Drop configuration
- Show Legend
- Disable Unload Queue
- Exit

By selecting the System Configuration, you will view the following:

BLMI System Setup

System Parameters

Number of Machine Drops: 14

Chute Door Close Timer: 0

Chute Open Door Timer: 0

Chute Door Delay at Drop Timer: 0

Startup Delay Timer: 0

Database Filename: C:\PPMM\HOME.SIT\procddata.db

Show Legend at Startup

ArcNet Parameters

Type 1 Card:

Type 2 Card:

Node ID: 255

I/O Port Address: 1010

Memory Mapped Address: 0

Monorail Type

Type 1:

Type 2:

OK

Cancel

Apply

The number of machine drops tells the BLMI how many machines that it is servicing. The BLMI can service up to sixteen (16) machines.

The Chute Door Close Timer, Chute Open Door Timer, Chute Door Delay at Drop Timer, and Startup Delay Timer is for machines with an inner door on the loading hopper and will be set by Softrol Personnel. These setups should not be changed unless instructed by Softrol.

The Database Filename tells the BLMI the location of the PPMM database.

Show Legend at Startup if checked, shows the condition of each machine that the BLMI is servicing when BLMI is started.

The ArcNet Parameters will be setup by Softrol and should not be altered in any way unless instructed. Altering these setups could potentially shut down the system.

The Monorail Type will be setup by Softrol and should not be altered in any way unless instructed. Altering these setups could potentially shut down the system.

Drop Configuration

By selecting the Drop Configuration, the user may set up, enable or disable the sling drops to the machine. Both the Monorail Manufacturer and Softrol System Inc, determine these setups. These setups should never be altered unless instructed by Softrol.

Show Legend

If Show Legend is not selected at startup, the Show Legend screen can be viewed by selecting this tab.

Disable Unload Queue

This setup is used in conjunction with the Monorail Manufacturer and Softrol Systems Inc. This setup should never be altered unless instructed by Softrol.



After a washer or a dryer has completed its cycle, the machine will look to see if there is a means to unload. The machine will send an invitation to be unloaded. If the conveyors “Belt Empty” input is on, the conveyor will send an invitation to be loaded. This will start the unload sequence.

NOTE: IF THE DRYER CONVEYOR HAS BEEN UNLOADED AND THE CONVEYOR IS A MANUALLY UNLOADED CONVEYOR THE BELT EMPTY BUTTON WILL NEED TO BE DEPRESSED OR THE CONVEYOR CONTROL SET UP TO AUTOMATICALLY DECLARE ITSELF EMPTY SO THE CONVEYOR WILL INVITE THE DRYER TO BEGIN THE UNLOAD SEQUENCE.

The unloading sequence begins. The machine will open the door and start tilting to the unload position. When the machine has reached its unload position, the conveyor will start indexing its belt according to its setups. The machine will start discharging its load according to its unloading sequence programmed on the process formula or to the default setting on the conveyor. When the load travels to the programmed destination and breaks the photo-eye, the conveyor tells the machine that it is empty. The machine will transfer the data record to the conveyor control. The machine will then position itself for receiving a load. When the machine reaches its load position, the machine will broadcast over the Softrol PulseNet network that it is ready to receive a load.

The AutoPulse conveyor system offers a set of diagnostic override displays that provide information about the system to aid in troubleshooting. The following list outlines the override displays and summarizes the function of each one. Press the up and down arrow keys simultaneously to display the overrides. Use the arrow keys to scroll.

Screen #1

Displays the status of each point (input or output) in Rack #1 and Rack #2. A constant of (1) is on and a (0) is off. Line three displays if the control is in automatic, the constant will read (1). If the control is in manual, the constant will read (0). Line four displays the current machine status and the selected machine status. Press the up arrow key to scroll to screen two.

```
Rack #1    Rack #2
00000000  00000000
System in Auto =0
MSat=00 SellStat=00
```

Screen #2

This screen displays the status of each point (input or output) in Slot #1 and Slot #3. A 1 is on and a 0 is off.

```
Slot 1 ACI Input:
00000000 00000000
Slot 3 1-16 Inputs/Outputs
00000000 00000000
```

Screen #3

This screen displays on line one when the control is broadcasting a request (waiting for load or unload) over the network and also the machine sequence. Line two displays when the control is sending or receiving the data record. Line three displays when the data record is being sent to the printer or PC. Line four displays the ArcNet ID in hexadecimal of the machine being loaded or unloaded.

```
ExtCast=0  MachSeq=0
GetDRec=0  SndDrec=0
DataRec to Printer =0
Private Link ID = 0
```


Screen #4

This screen displays on line one the programmed unload sequence. Line two displays the item code and the customer code. Line three displays the destination and lot number. Line four displays the dryer classification and the dry formula number.

```
DATAREC ULPrm = 0
I = 0          C = 0
D = 0          L = 0
DClass=00     Dform=00
```

Screen #5

This screen displays on line one the connecting belt ID's. Line two displays the unload parameters positive and negative ends. Line three displays the post process to receive low limits and high limits.

```
CB ID's      0    0    0    0
UnLs PP      00   NP   00
PP LL 0      HL   00000
(blank line)
```

Screen #6

This screen displays the status of a semi-automatic interface with each point (input or output) for an Auxiliary Rack and Slot #7. A 1 is on and a 0 is off.

```
AuxRACK1 In / Out:
Inp=0000 Out=0000
Slot 7 1-16 Inputs/Outputs
00000000 00000000
```

Screen #7

This screen is for Softrol troubleshooting.

```
Foreground Sta=0
Cast1 Sta Ptr = 0
Ptr #1 = 0
(blank line)
```

Screen #8

This screen displays the Backscans, software date, ArcNet ID, and software name, version, and revision numbers.

```
Bacscans = 123456
(Blank Line)
01-05-2001 ID# 0
SOFTBELT V3.0 R0.0
```

The menu structure on the AutoPulse Belt Conveyors is as follows:
Place the machine into the manual mode. The display will read

Softrol Systems
Manual Enabled

Enter a valid level seven password. The display will read

- 1=Setups
- 2=Maintenance
- 3=Set Clock
- 0=Exit

1=Setups

The following will be displayed:

- 1=Belt Setup
- 2= Password

Pressing 1=Belt Setup, you can view and change all of the belts automation and operational setups.

Conveyor Control Setups
Belt Type

The control can currently be configured for one of the following type belts:
Certain setups pertain only to the belt type selected.

Unload Washers Belt

Meaning the belt unloads washers only.

Unload Belts Belt

Meaning the belt unloads belts only.

Unload Dryers Belt

Meaning the belt unloads dryers only.

Unload Belt / Load Dryer Belt

Meaning the belt unloads washers or another belt and loads a dryer.

No Dry Belt

Meaning the belt unloads a shuttle and bypassing the dryers.

Unload Shuttle

Meaning the conveyor unloads a shuttle.

Unload Washer / Load Dryer Belt

Meaning the conveyor unloads a washer and loads a dryer. This belt is typically an extend/retract type belt

Unload Dryers Belt / No Dry Belt (DND)

Meaning unloads a shuttle or dryers.

Transfer Load Auto Pos. - Yes / No

If Transfer Auto Pos. is set to Yes, when the belt is loaded it will go to a state where it assumes the identity of a Washer and waits to be unloaded automatically to the positive end of the belt. The belt will usually be unloaded by another belt. If Transfer Auto is set to No, when the belt is loaded it will go to a state where a message is displayed telling the operator to unload the belt and reset it to empty when unloaded. This setup does not apply to an Unload Belt / Load Dryer Belt.

Transfer Load Auto Neg. - Yes / No

If Transfer Auto Neg. is set to Yes, when the belt is loaded it will go to a state where it assumes the identity of a Washer and waits to be unloaded automatically to the negative end of the belt. The belt will usually be unloaded by another belt. If Transfer Auto is set to No, when the belt is loaded it will go to a state where a message is displayed telling the operator to unload the belt and reset it to empty when unloaded. This setup does not apply to an Unload Belt / Load Dryer Belt.

Unload a Belt – Yes / No

This setup tells the control if the conveyor also unloads a belt along with a dryers another piece of equipment for example a DND belt. If answered No, certain setups are skipped.

Post Process Range to Receive (Low Limit)

Every load passed onto a belt should have a Post Process (**Destination**) Number associated with it as part of the Data record for that Load. This setup is used along with the next one (High Limit) to establish a range of values for Post Process Numbers to be received by an Unload Belts Belt. For example; If an Unload Belts Belt is empty and sending an invitation to unload another belt, it will check the Post Process # of the load on any belt that responds. If the Post Process # of the load on any responding belt falls within the acceptable range of Post Process Numbers to receive, a criterion for an automatic unload is met. This is one of three criterions that must be met before a Belt will automatically unload another Belt.

Post Process Range to Receive (High Limit)

Used along with the above setup to establish a range for Post Process Numbers to be received by an Unload Belts Belt. See above Setup.

Connecting Belt #11 ID

All of the Connecting Belt ID setups #11 - #14 allow an Unload Belts Belt sending an invitation to unload a belt to determine if a responding belt is a connecting Belt. The respondent ID is compared to each of the Connecting Belt IDs #11 - #14. If the respondent's ID matches any of the four, a criterion for an automatic unload is met. This is one of three criteria that must be met before a Belt will automatically unload another Belt. Connecting Belt #11 is a Positive end connecting Belt and causes the Transferring Belt to run Positive while being unloaded. If there is no positive end connecting Belt set this ID to 0.

Connecting Belt #12 ID

Connecting Belt #12 is a Negative end connecting Belt and causes the Transferring Belt to run Negative while being unloaded. If there is no negative end connecting Belt set this ID to 0.

Connecting Belt #13 ID

Connecting Belt #13 is a Positive end connecting Belt and causes the Transferring Belt to run Positive while being unloaded. If there is no positive end connecting Belt set this ID to 0.

Connecting Belt #14 ID

Connecting Belt #14 is a Negative end connecting Belt and causes the Transferring Belt to run Negative while being unloaded. If there is no negative end connecting Belt set this ID to 0.

Connecting Dryer ID

This setup applies to the Unload Belt / Load Dryer Belt only. For all other type belts set this parameter to 0. The Unload Belt / Load Dryer Belt is an extend / retract belt similar in operation to a shuttle belt except that it only services one belt and one dedicated dryer. The network ID of the dedicated dryer to be serviced by the Unload Belt / Load Dryer Belt is entered in this setup.

Unload Positive W/D Position

This setup value along with the next (Unload Negative W/D Position) determines the direction the belt will run while unloading a washer or dryer. One or the other of the Unload Positive or Unload Negative Position setup values must match the Unload Position of the machine being unloaded. This is the only criterion to be met before a belt will select a washer or dryer for unloading.

Unload Negative W/D Position

This setup value along with the previous (Unload Positive W/D Position) determines the direction the belt will run while unloading a washer or dryer. If the unload position of the machine being unloaded matches the Unload Negative Position setup value, the belt will run in the negative direction while receiving a load.

Unload Positive BLT Position

This setup value along with the next (Unload Negative BLT Position) determines the direction the belt will run while unloading another belt. One or the other of the Unload Positive or Unload Negative Position setup values must match the Unload Position of the belt being unloaded. It is one of three criteria to be met before a belt will unload another belt. If the unload position of the machine being unloaded matches the Unload Positive Position setup value, the belt will run in the positive direction while receiving a load.

Unload Negative BLT Position

This setup value along with the previous (Unload Positive BLT Position) determines the direction the belt will run while unloading another belt. If the unload position of the belt being unloaded matches the Unload Negative Position setup value, the belt will run in the negative direction while receiving a load.

Max. Time Belt Full

This setup parameter is the time (in seconds) that the conveyor belt should wait to declare itself loaded when unloading a washer or dryer after items have passed the eye to ensure that all items have been unloaded.

Max. Time Unload Sequence

A belt sequence timer runs during many of the steps the belt control goes through while receiving and transferring loads. If the running timer ever exceeds the set value of this parameter the Belt Control System Alarm will be set off. Pressing the [CLR] key on the control keypad can clear the Alarm. This resets the belt sequence timer to 0.

Belt Run Time at RX Minimum Time

This setup determines the minimum time that the belt will run while receiving a load from a washer, dryer, or from another belt. The run of the receiving belt is usually stopped when the load being received blocks the photo eye at the end of the belt. However, the photo eyes on the receiving belt will be ignored until the set value of this parameter is accomplished.

Belt Run Time at RX Maximum Time

This setup determines the maximum time that the belt will run while receiving a load from a washer, dryer, or from another belt. The run of the receiving belt is usually stopped when the load being received blocks the photo eye at the end of the belt. However, the photo eyes on the receiving belt will be ignored until the set value of this parameter is accomplished.

W/D Belt Delay at Receive

This setup value is evaluated when the belt is receiving a load from a washer, dryer or shuttle. Once the transferring machine starts to pass its load to the receiving belt a timer is started. The receiving belt will not start its belt into motion until the timer has a value greater than the set value of this parameter. This does not apply to a DND type belt.

W/D Belt at Receive Jog Off

This setup parameter along with the next (Jog Belt On at Receive) can be used to automatically jog the belt On and Off while receiving a load from a washer or dryer. The maximum Jog Off time that will be accepted is 1:00 minute. If this parameter is set to 0:00, the next parameter will be skipped and the belt will run continuously while receiving the load.

W/D Belt at Receive Jog On

This setup is used in conjunction with the previous parameter and will determine the duration of the On part of the Jog On / Off cycle. The maximum Jog On time that will be accepted is 1:00 minute.

Belts Belt Delay at Receive

This setup value is evaluated when the belt is receiving a load from another belt. Once the transferring machine starts to pass its load to the receiving belt a timer is started. The receiving belt will not start its belt into motion until the timer has a value greater than the set value of this parameter.

Belts Belt at Receive Belt Jog Off

This setup parameter along with the next (Jog Belt On at Receive) can be used to automatically jog the belt On and Off while receiving a load from another belt. The maximum Jog Off time that will be accepted is 1:00 minute. If this parameter is set to 0:00, the next parameter will be skipped and the belt will run continuously while receiving the load.

Belts Belt at Receive Belt Jog On

This setup is used in conjunction with the previous parameter and will determine the duration of the On part of the Jog On / Off cycle. The maximum Jog On time that will be accepted is 1:00 minute.

Eye Block Delay Positive

This setup is the time (in seconds) that the conveyor should run the belt in the positive direction after sensing that the belt is full. The belt full indication will be ignored during this time.

Eye Block Delay Negative

This setup is the time (in seconds) that the conveyor should run the belt in the negative direction after sensing that the belt is full. The belt full indication will be ignored during this time.

Belt Run Time at Transfer Min. Time

This setup determines the minimum time that the belt will run while transferring a load to another belt or machine. The run of the belt will continue until the value of this parameter is accomplished regardless of whether the load has reached the photo eye at the end of the belt or not. This value has to be greater than zero.

Belt Run Time at Transfer Max. Time

This setup determines the maximum time that the belt will run while transferring a load to another belt or machine. The run of the belt will be stopped when the value of this parameter is accomplished regardless of whether the load has reached the photo eye at the end of the belt or not. This value has to be greater than the minimum time.

Belt at Transfer Jog Off

This parameter along with the next (Jog Belt On at Transfer) can be used to automatically jog the belt On and Off while transferring a load to a dryer or to another belt.

Belt at Transfer Jog On

This setup is used in conjunction with the previous parameter and will determine the duration of the On part of the Jog On / Off cycle.

Signal Mute Time

This allows the user to define how long a signal will be ignored when pressing the CLR key.

Hold Load at the Positive End = Yes / No

If Move Load to a Hold Position = Yes, and Hold Load at the Positive End = Yes, the load will be moved to the belts positive end as soon as the load has been received from the transferring machine.

Hold Load at the Negative End = Yes /No

If Move Load to a Hold Position = Yes, and Hold Load at the Negative End = Yes, the load will be moved to the belts negative end as soon as the load has been received from the transferring machine.

Hold Load According to Post Process Number = Yes / No

If Move Load to a Hold Position = Yes, and Hold Load According to Post Process Number = Yes, the load will be moved to the appropriate end of the belt according to the Post Process Number (Destination) of the Load. The appropriate end is determined by comparing the Post Process Number with the range of numbers to be received at either end of the belt. This is setup with the following parameters (Post Process Numbers to Positive End and Post Process Numbers to Negative End)

Post Process Numbers to Positive End (Low Limit)

This setup defines the low limit of the range of Post Process Numbers that will be transferred off the belt at the positive end and therefore moved there for holding. This value must be less than 999 to be accepted.

Post Process Numbers to Positive End (High Limit)

This setup defines the high limit of the range of Post Process Numbers that will be transferred off the belt at the positive end and therefore moved there for holding. This value must be greater than the value entered for the low limit parameter above, in order to be accepted.

Post Process Numbers to Negative End (Low Limit)

This setup defines the low limit of the range of Post Process Numbers that will be transferred off the belt at the negative end and therefore moved there for holding. This value must be less than 999 to be accepted.

Post Process Numbers to Negative End (High Limit)

This setup defines the high limit of the range of Post Process Numbers that will be transferred off the belt at the negative end and therefore moved there for holding. This value must be greater than the value entered for the low limit parameter above, in order to be accepted.

Post Process Interference (Yes/No)

This setup defines whether a belt can have interference while receiving a load from either the negative or the positive ends of the belt.

Post Process Interference Low

This setup defines the low limit of the range of Post Process Numbers that will be interfering with a transfer off the belt.

Post Process Interference Hi

This setup defines the Hi limit of the range of Post Process Numbers that will be interfering with a transfer off the belt.

Variable Speed Drive = Yes / No

The belt control has a single Input that is used to set off a control system alarm if the Motor Overloads trip or if the Variable Speed Drive should fault, depending on which is used by the belt. If contactors are used instead of a variable speed drive this setup would be set to "Variable Speed Drive = No".

Flash in Auto = Yes / No

This setup allows the Belt in Auto Output to be pulsed On and Off if “Flash in Auto = Yes”. The primary use of this option is to allow flexibility in sending the signal Belt is in Auto (Automatic operating Mode). It is most helpful for system operators to be able to know this even by observing the control from a distance. This can prevent the hold up of all machines that would pass their loads to a conveyor sitting idle and not in the Auto Mode. The real use of being able to flash this output is when there is no dedicated indicator for the Belt in Auto signal. The output can then be put in series with another indicator such as Belt Full or Belt Empty. The flashing of these signals would then indicate that the belt is in the Auto Mode.

Extend Retract

This setup tells the control if the belt needs to extend or retract to receive or transfer a load.

Retract Belt When Empty

This setup if answered Yes commands the belt when emptied to wait for the next command in the retracted position.

Retract Belt When Loaded

This setup if answered Yes commands the belt when loaded to wait for the next command in the retracted position.

Retract Belt While Loading

This setup tells the control to place the belt into the retracted position while receiving a load.

Retract Belt When Unload Positive

This setup tells the control to place the belt into the retracted position when unloading in the positive direction.

Retract Belt When Unload Negative

This setup tells the control to place the belt into the retracted position when unloading in the negative direction.

Extend at Transfer by Post Process Number Lo Limit

This setup tells the control to extend while transferring the goods to another belt when a post process number is greater than the programmed low limit.

Extend at Transfer by Post Process Number Hi Limit

This setup tells the control to extend while transferring the goods to another number is lesser than the programmed low limit.

Formula Range Low

This establishes the minimum formula number that a machine will accept for a load.

Formula Range Hi

This establishes the maximum formula number that a machine will accept for a load.

Machine Class Type

This is the class type of the machine. The valid range is 0 to 94. Certain machines may be equipped differently than other machines. In addition, certain processes may be preferred in particular machines. This is accomplished through using the Class Type. When items to be processed are entered into the AutoPulse system, they are assigned a Class Type Number for the Wash Classification. The corresponding items will be processed in a machine with a matching Class Number. Assigning Machine Class Type 99 will prevent the machine from automatic operation and is useful when maintenance or testing is performed on a machine.

Loading Position

This is the position for a connecting belt to load the receiving belt. Positions are numbered in a system from 1 to 99. Position 0 tells the control that cannot receive a load from an attaching belt. **PLEASE NOTE: A LOADING POSITION MUST MATCH THE UNLOADING POSITION OF AN ATTACHED BELT.**

Unloading Positions

This is the position that the transferring belt unloads onto a receiving belt. Positions are numbered in a system from 1 to 99. Position 0 tells the control that cannot transfer a load from an attaching belt. **PLEASE NOTE: AN UNLOADING POSITION MUST MATCH THE LOADING POSITION OF AN ATTACHED BELT.**

NoDry Positive

If the Belt Type setup is answered Unload Dryers Belt / No Dry Belt (DND) and a stand alone NoDry Belt, answering Yes to this setup commands the belt to receive the goods toward the positive direction when receiving a load from a NoDry location. Answering No to this setup commands the belt to receive the goods toward the Negative direction when receiving a load from a NoDry location.

Sequence Priority #

The sequence priority establishes the manner in which machines are selected for loading and unloading. Machines with a sequence priority of zero will rotate priority according to how long the machines have been waiting to load or unload. Machines with a sequence priority greater than zero attain a higher priority of selection than those units with a sequence priority of zero. A sequence Priority of 1 is the highest priority. The available machine with the smallest non-zero priority will be selected preferentially.

Database ID

This is the required ArcNet ID number for the PulseNet Plant Monitor (PPMM or PPMM) database.

Validate Datarecord

This setup when answered Yes, it allows the operator to view the datarecord and edit accordingly on manually loaded conveyors that are automatically unloaded.

1= Wash Process Data

2= Dryer Process Data

3= Item Specific Data

YES + NO = Accept

Query Data Base

This setups if answered Yes, allows the operator to enter an Item code on a manually loaded conveyor from the keypad and the conveyor control will query the PPMM Database for its datarecord. Please refer to the PPMM manual for setting up the database.

Semi-Auto Dryer

This setup if answered Yes, allows a non MicroPulse dryer control (dry contact) to automatically unload. PLEASE NOTE ADDITIONAL HARDWARE IS REQUIRED FOR THIS TYPE OF INSTALLATION.

Semi-Auto Unload

This setup if answered Yes, allows the conveyor control to pass the Item Code, Weight, and Customer Code (dry contact) to an unloading device. PLEASE NOTE ADDITIONAL HARDWARE IS REQUIRED FOR THIS TYPE OF INSTALLATION.

Semi-Auto Unload Positive

This setup if answered Yes, allows will pass the above data record to the Positive End of the conveyor.

Semi-Auto Unload Negative

This setup if answered Yes, allows will pass the above data record to the Negative End of the conveyor.

Pressing 2= Passwords you can view and edit the level seven password. To change the passwords, a valid level 7 password must be entered. From the Waiting to Load screen enter a valid level 7 password. Select 1=Setup. Select 2=Passwords. Using the arrow keys, scroll to the password that needs to be changed or viewed. A password consists of 1 to 6 numbers. Examples are 1 or 080499. Using a six-digit password is recommended.

2=Maintenance

The following will be displayed:

- 1=Test Inputs
- 2=Test Outputs
- 3=Board Responses
- 0=Exit

1=Test Inputs

Pressing this, you can view the input status. Following is a list of the inputs. By using the arrow keys, you can scroll through the list.

- S101-Belt Positive End Clear
- S102-Belt Negative End Clear
- S103-Belt #2 Positive End Clear
- S104-Belt #2 Negative End Clear
- S105-Belt at Extended Position
- S106-Belt at Retract Position
- S107-Reserved Input
- S108-Reserved Input
- S109-Request Belt Empty Push Button (PB)
- S110-Hold Request / On Hold
- S111- Manual Enabled
- S112-Emergency Stop OK
- S113-VFD(s) OK
- S114-Overloads OK
- S115-Allow Auto
- S116-Start Auto
- S301-Request Belt Positive PB
- S302-Request Belt Negative PB
- S303-Request Belt Unload PB
- S304-Request Stop Unload PB
- S305-Request Belt #2 Positive PB
- S306-Request Belt #2 Negative PB
- S307-Reserved Input
- S308-Reserved Input

2=Test Outputs

Pressing this, you may check the output status. Following is a list of the outputs. By using the arrow keys, you can scroll through the list. By Pressing the [YES} key, you may toggle the output on and off.

S309-Belt in Automatic Light
S310-Belt is Empty Light
S311-Belt is Loaded Light
S312-Reserved Output
S313-Reserved Output
S314-Belt Hold / On Hold
S315-Control Alarm
S316-Movement Alarm
R101-Run Belt Positive
R102-Run Belt Negative
R103-Select Unload Speed
R104-Reset Belt VFD(s)
R105-Extend Belt
R106-Retract Belt
R107- Run Belt #2 Positive
R108- Run Belt #2 Negative

3=Board Responses

Pressing this, you may view the board responses. Following is a list of the boards (Racks). A no Response = 0 tells us that the rack is communicating properly. By using the arrow keys, you can scroll through the list.

I/O Rack #1
I/O Rack #2
I/O Rack #3
I/O Rack #4
I/O Rack #5
I/O Rack #6
I/O Rack #7
I/O Rack #8

3=Clock

To set the clock, enter a valid level 7 password from the Waiting to Load screen.

Date= 00:00:00
Enter New Date
Date= 00:00:00
ENTER= Accept No= exit

Enter the day, month, and year. For example the date is July 4, 2000 press [0][8][0][4][0][0].

Date= 00:00:00
Enter New Date
Date= 08:04:00
ENTER= Accept No= exit

Press [ENT].

Time= 00:00:00
Enter New Time
Time= 00:00:00
ENTER= Accept No= exit

The clock is in a 24-hour format also known as European. Enter the hour, minutes, and seconds. For example, if the time is 3:15:33 PM, press [1][5][1][5][3][3].

Time= 00:00:00
Enter New Time
Time= 15:15:33
ENTER= Accept No= exit

Press [ENT].

Light Stack

The AutoPulse conveyor control can also be optionally equipped with a four stage light stack. The light stack consists of **AmberGreenRedBlue**. The Four-Stage Light Stack is used to signal the operator the status of the conveyor. The amber illuminates when the conveyor is loaded. The green illuminates when the conveyor is empty. The red illuminates when the conveyor is in automatic mode. The blue illuminates when the conveyor is in the manual mode. Therefore, the light stack should be mounted where the operator and those concerned with the conveyor status will easily see it. The light stack should be wired to the appropriate 24 VAC terminals in the control enclosure as indicated by the Softrol AutoPulse Pocket Loading Conveyor schematic.

System Restart Menu

When the control is in the System Restart Menu meaning the Auto/Manual is switched to Auto, the screen will indicate whether the conveyor is loaded or empty. If the belt is empty, the screen will read as follows:

System Restart Menu
 1= Resume Auto

Belt Is Empty!

If the belt is loaded, the screen will read as follows:

System Restart Menu
 1= Resume Auto
 2= Data Record
 Belt Is Loaded!

From either state, pressing the one (1) key will place the control into automatic operation.

If the belt control is in the empty state, pressing the [ENT] and the [YES] keys simultaneously will toggle the control to the loaded state.

System Restart Menu 1= Resume Auto	[ENT] + [YES]	System Restart Menu 1= Resume Auto 2= Data Record Belt Is Loaded!
Belt Is Empty!		

If the belt control is in the loaded state, pressing the [ENT] and the [CLR] or [NO] keys simultaneously will toggle the control to the empty state.

System Restart Menu 1= Resume Auto 2= Data Record Belt Is Loaded!	[ENT] + [CLR or [NO]]	System Restart Menu 1= Resume Auto Belt Is Empty!
--	-----------------------	---

By pressing 2= Data Record, the display will read as follows:

- 1= Edit Data Record
- 2= Retrieve Data Record

By pressing 1= Edit Data Record, the display will read as follows:

- Key in Lot Number
- Lot # =
- Customer # =
- Pounds =
- Count =
- Destination =
- Yes + No to End

By pressing 2 = Retrieve Data Rec., the control will retrieve the data record form the Database ID for the PulseNet Plant Monitor (PPMM or PPMM) database.

Semi Auto Belt Unload

The semi-auto belt unload option unitizes an auxiliary rack and an 8x8 card. The aux. Rack is addressed as rack 2 and the 8x8 card is installed in slot 7 of the card cage.

At this time the inputs of the 8x8 card are not used.
The outputs of this card are used as follows.

- | | |
|--------------------|----------------------|
| 709 = binary bit 1 | 713 = binary bit 16 |
| 710 = binary bit 2 | 714 = binary bit 32 |
| 711 = binary bit 4 | 715 = binary bit 64 |
| 712 = binary bit 8 | 716 = bit binary 128 |

The data transferred is **Item Number** followed by **Weight**, followed by **Customer Number**.

The auxiliary rack has 4 input modules and 4 output modules.

They are labeled as follows:

- | | |
|--|------------------------------------|
| Input 201 = Start Belt Unload Sequence | Output 205 = Belt Needs Unloading |
| Input 202 = Next Data | Output 206 = Weight Latch |
| Input 203 = Request Belt Forward | Output 207 = Customer Number Latch |
| Input 204 = Request Belt Reverse | Output 208 = Spare |

The sequence of operation for unloading the belt works as follows;

- Belt control moves load to photo eye on the auto unload end of the belt.
- Item Number (formula #) is set on slot 7 card outputs.
- Output 205 Belt Needs Unloaded is turned on to signal unload device that a load is available.
- Unload device reads Item Number
- Unload device sends signal to input 201 Start Unload Sequence
- Belt control sets Weight on slot 7 card output
- Output 206 Weight Latch is turned on.
- Unload Device reads Weight bits.
- Unload Device sends signal to input 202 Next Data
- Belt control turns off Output 206 Weight Latch and sets binary bits on slot 7 card to Customer Code
- Belt control turns on Output 207 Customer Number Latch
- Unload device reads Customer Number.
- Unload device sends signal to Inputs 203 and 204 to request belt movement forwards and reverse as needed for unloading the belt. (Note: These signals may be sent at anytime after the belt control turns on Output 205 Belt Needs Unloading)



Installation Procedure

This procedure is intended to serve as a general guide for installation of the 1 to 5 pocket Softrol AutoPulse Pocket Loading Conveyor. The various tasks to be accomplished in the installation should follow the order in which they are described below:

Setting the Conveyor

The conveyor must first be moved to its approximate operating position by placing the loading end of the conveyor in a pit provided by the customer. The conveyor pit must meet required specifications of dimensions and location. If the conveyor is to be sling or cart loaded, no pit is required.

The conveyor should next be adjusted to its final position in reference to the rails of the Softrol AutoPulse Shuttle, which will be moving up to the Conveyor to take loads from it when the system is put into operation. See drawings provided for distance from a reference point on the conveyor to the nearest shuttle rail for correct positioning. As the conveyor is positioned, conveyor legs that will be mounted on load cells should be set on blocks of the same height as the load cells. This will allow the installer to easily mount the load cells one at a time without over loading them or subjecting them to side loads or other forces that could damage the load cells.

The 1 to 3 Pocket Softrol AutoPulse Conveyor should have a load cell mounted under each of the four conveyor legs. The 4 or 5 Pocket Softrol AutoPulse Conveyor will have only two load cells mounted under each of the two legs on the loading end of the conveyor. The load cell assembly when installed should be oriented to where the 1/2" steel mounting plate is against the floor. Also the load cell should be turned to the position in which it is least likely to be damaged, most likely with its cable end toward the opposite end of the conveyor.

If the front legs of the conveyor are to be without load cells, anchor them to the floor first. Then, for legs that are to have a load cell attached: raise the leg slightly off the block it is resting on, bolt on the load cell, then gently lower the conveyor leg until the load cell assembly rests on the floor. Anchor the load cell assembly to the floor and precede to the next conveyor leg until all load cell assemblies are attached and anchored to the floor.

Run Power and Communication Cables to the Conveyor

Run power cables of correct size, type and voltage to the conveyor motor controller. Run a 120 VAC power supply cable to the conveyor control. Then run the Softrol PulseNet system communications cable (RG-62 Coax) from the conveyor control to the appropriate Softrol PulseNet system communications hub. The communications cable ***should not*** be run in conduit with power cables or tied directly to power cables.

Attach Light Stack to the Conveyor

The Four-Stage Light Stack (**amber**, **green**, **red**, **blue**) is used to signal the operator as to the number of conveyor pockets that are empty, indicate when a Shuttle is being called to the conveyor, and indicate weight status while loading a pocket. Therefore, the light stack should be mounted where the operator and those concerned with the conveyor status will easily see it. The light stack should be wired to the appropriate 24 VAC terminals in the control enclosure as indicated by the Softrol AutoPulse Pocket Loading Conveyor schematic.

Wiring Load Cell Signal Conditioning Module (Calex Model Only)

All load cells, whether two or four in number, should be connected in parallel to the load cell signal-conditioning module. Ideally the signal conditioning module will be located to where the cable lengths from load cells to the signal conditioning module will be minimized at the expense of lengthening the 4-20 mA current loop cable running from the signal conditioning module to the controllers AIO420 card. The cables attached to the load cells should not be lengthened for installation. They should be connected as follows if a Calex Model 433 Bridgesensor is used:

Screw Terminal	Function	Load Cell Wire Color	Screw Terminal	Function	Load Cell Wire Color
1	-Sense	Brown	6	120 VAC	
2	-Excitation	Black	7	+ Signal	Green
3	+Sense	Blue	8	- Signal	White
4	+Excitation	Red	9	Output	
5	120 VAC		10	Return	

Note: Terminal 9 (***Current Loop Output***) should be attached to Pin #1 of the AIO420 card that should be in slot 2 of the controller card cage. Terminal 10 (***Current Loop Return***) should be connected to Pin #10 of the AIO420 card.

If load cells have 4 wires only the remote sensing will not be used, in this case connect +Sense with +Excitation (**terminals 3 & 4**) and connect -Sense with -Excitation (**terminals 1 & 2**).

If load cells have 6 wires, remote sensing may or may not be used. The function of the sense leads is to regulate the load cell excitation voltage directly at the bridge (**at the load cell**) rather than at the bridge-sensor itself. If sense leads are not used and terminals are not connected as described in the note just above, the load cell excitation supply will not be regulated and will drift.

Connect the load cell cable shield (**yellow or bare wire**) to Terminal 2 (**-Excitation**) as long as there is no continuity between the shield wire and the machine frame.

Adjusting Load Cell Signal Conditioning Module

After all wiring to the bridge-sensor is complete, follow the steps outlined under the heading "**Getting Started with the Model 433**" found in the Model 433 bridge-sensor documentation. After completion of these steps the bridge sensor should be set to where calibration can be accomplished.

In step 2 of the procedure set SWB-1 to "On" for a fixed 10-volt excitation supply to the load cells.

In step 7 of the procedure set SWA-2 to "On" for 0mA output ZERO.

In step 12 of the procedure the gain potentiometer can be adjusted without completely loading the conveyor. A value used in the controller's software known as counts per pound is set when the load cell calibration routine is accomplished. This value should be approximately 2.6 for the AutoPulse Loading Conveyor with a 1500-lb capacity.

Take a known weight of 100 lb. or more and multiply the weight by 2.6 and record the value. Place the weight in the loading pocket of the conveyor. Press both arrow keys on the 16 Key keypad to view the controls over ride displays used for maintenance and troubleshooting. Press the up arrow key once to go to the second display.

Adjust the gain Potentiometer until the AIO420 (**Cnts**) displayed on the first line of the LCD is equal to the weight multiplied by 2.6 as calculated above. The gain should now be set. It can be checked at a later time with the conveyor loaded. Fully loaded the AIO420 counts should not exceed 4000.

Other Load Cell Manufacturers

For other Load Cell Manufacturers, please consult Softrol Systems for wiring specifications.

Setup of Conveyor Control

After all of the above steps have been accomplished, the conveyor is ready for the control to be powered up and control parameters set by going through the setup routines. The load cell calibration routine should be accomplished after all the other setups have been performed.

Menu Structure

The menu structure on the AutoPulse Single Pocket Conveyors is as follows:

Place the machine into the manual mode. The display will read

**Softrol Systems
Manual Enabled**

Enter a valid level seven password. The display will read

1=Setups
2=Maintenance
3=Set Clock
0=Exit

1=Setups

The following will be displayed:

1=Belt Setup
2= Password
3= Calibrate Ld Cells

Pressing 1=Belt Setup, you can view and change all of the belts automation and operational setups.

Data Base ID #

This unique Network ID number is for the PC containing the Softrol Plant Monitor Database and should be set to 255.

Validate Lot #

Normally the product Item Number alone is the unique identifier to distinguish a load of goods to be processed from all other type loads that may enter the AutoPulse System for processing. The Lot Number can be up to six digits long allowing the operator 999,999 different type product loads each with its own defined wash and dry formulas, machine class destinations and etc. If for some reason Item Number alone is not enough to identify a particular type load, this setup will allow the Lot Number to be entered just after the Item Number by the operator at the beginning of a pocket loading sequence. The Lot Number will then be validated along with the Item Number to select the correct Loading Conveyor Data Record containing the necessary processing data. This data will be automatically downloaded from the PPMM Data Base to the conveyor control if the Item Number and Lot Number were both valid.

Use Load Cells

This parameter should be set to No if the conveyor is setup without Load Cells or if a problem should occur with the conveyors weighing mechanism. If set to No, the control will bypass the part of the pocket loading sequence where the pocket weight is measured as the goods are being loaded into the conveyor and where the “Green Light” given when the loaded weight is within the acceptable range. Instead, the control will display “Is Pocket Fully Loaded?”. When the [ENT] key is pressed the loading procedure will continue to the prompts for Lot Number, Customer Number and etc. regardless of pocket load weight.

Variable Speed Drive

This setup tells the control if the Softrol AutoPulse Pocket Loading Conveyor will have a belt driven with a variable speed drive unit.

Transfer (TX) Loads to Shuttle

This setup determines whether the AutoPulse Pocket Loading Conveyor will automatically load a shuttle or a connecting belt #11.

Shuttle Load Pos. #

This is the number of the shuttle floor marker or photo eye position that lines up the shuttles soil belt with the loading conveyor.

Shuttle Priority

If this parameter is answered No, the operator will have approximately 10 seconds immediately after a pocket loading sequence has ended to press the [ENT] key and again take control of the conveyor to load another pocket. If this parameter is answered Yes, the conveyor could call a shuttle to take a load from the conveyor before the operator could act to initiate another pocket loading sequence.

Metric System

This setup is used for determining metric or standard weights.

Signal Mute Time

This is a programmed time that by pressing the [CLR] key will ignore the audible alarm while troubleshooting a problem.

Check Minimum Weight

This setup is used when there are two Softrol AutoPulse Pocket Conveyors of different weight ranges on the same Softrol PulseNet Network

Max Fwd/Rev Run Time

This setup value is evaluated in the pre-scan. If the Motor Fwd (Out101) or Motor Rev (Out102) Output is on for a time that exceeds this value, the Motor Fwd and Motor Rev Outputs are reset and the system alarm control relay is set causing an error message to be displayed. This setup should be set to a value approximately equal to the time required for one and one half of a pocket to run past any point of reference. This is to prevent the conveyor from dumping all of its pockets if the pocket sensing photocell should fail.

Jog Belt Off at Transfer (TX)

This parameter along with the next (Jog Belt On at Transfer) can be used to automatically jog the belt On and Off while transferring a load to a shuttle or connecting belt #11.

Jog Belt On at Transfer (TX)

This setup is used in conjunction with the previous parameter and will determine the duration of the On part of the Jog On / Off cycle.

Use Time to TX Load

This setup runs the conveyor for the programmed time while loading the shuttle or another conveyor.

Max Time to Load Pkt

When the conveyor is in the Stand By mode (in Automatic and ready for commands) the operator must press the [ENT] key to begin the conveyor pocket loading procedure. Once the [ENT] key is pressed the conveyor will be in Load Request Mode and will wait for the operator to enter an Item Number for the goods to be loaded. If the operator should leave the conveyor without completing the loading procedure the conveyor would be stuck waiting for the operator and would not be able to automatically pass loads to the shuttle. This setup parameter design is to be used in sounding an alarm if the above-described situation should occur causing the conveyor to stay in Load Request Mode for an extended time period. Set this parameter for a time slightly longer than the average time required loading a pocket.

Prmpt for Lot#

The operator will not be prompted for this setup if the above parameter was answered Yes. If the above parameter was answered No and this parameter is answered Yes, the operator will be prompted to enter a Lot Number after loading a pocket and just before the pocket loading sequence is ended. The Lot Number loaded from the PPMM Data Base will appear at the prompt and can be changed by the operator or allowed to remain the same just by pressing the [ENT] key.

Prmpt for Cust#

If this parameter is answered Yes, the operator will be prompted for Customer Number after being prompted for Lot Number (if prompt for Lot Number was answered Yes). The Customer Number loaded from the PPMM Data Base will appear at the prompt and can be changed by the operator or allowed to remain the same just by pressing the [ENT] key.

Prmpt for Wt.

If this parameter is answered Yes, the operator will be prompted for Process Weight after being prompted for Customer Number (if prompt for Customer Number was answered Yes). The actual Pocket Load Weight just measured by the conveyor was loaded into this parameter. It will appear at the prompt and can be changed by the operator or allowed to remain the same just by pressing the [ENT] key. The actual measured weight for the pocket load was also loaded into another parameter called Measured Weight (Fdr 14), which is also part of the AutoPulse Data Record. This actual measured weight will not be changed in the record by changing the Process Weight (Fdr 1) at this prompt.

Prmpt for Count

If this parameter is answered Yes, the operator will be prompted for Item Count after being prompted for Process Weight (if prompt for Weight was answered Yes). The Item Count loaded from the PPMM Data Base will appear at the prompt and can be changed by the operator or allowed to remain the same just by pressing the [ENT] key. If an Item Count is entered by the operator that is outside the allowable range established by the following two parameters “**OUT OF RANGE**” will be displayed and the number entered will not be accepted.

Key in Minimum Count

This is the minimum amount of product that is allowed per pocket.

Key in Maximum Count

This is the maximum amount of product that is allowed per pocket.

Max-Pkt Wt Range (+/-)

If Process Weight (Fdr 1) from the Softrol AutoPulse Data Record is \leq Max-Pkt Ld, then Process Weight is used along with this setup value or Weight Tolerance (Fdr 4) to calculate a minimum and maximum acceptable pocket load weight range, if not Max Pkt Ld is used. If Weight Tolerance (Fdr 4) from the AutoPulse Data Record is \leq Max-Pkt Wt Range (+/-), Weight Tolerance is used to calculate the minimum and maximum acceptable pocket load weight range, if not Max-Pkt Wt Range (+/-) is used. Max-Pkt Ld (420 lbs) if control is set for a 5 Pocket Conveyor or Max-Pkt Ld (500 lbs) if set for a 3 Pocket Conveyor this parameter is used along with the above parameter as described above to calculate minimum and maximum acceptable pocket load. The pocket load weight measured and displayed by the conveyor must fall in the range between the minimum and maximum calculated values when a conveyor pocket is being loaded. Otherwise, the operator will not be allowed to complete the loading sequence in the normal manner.

Maximum Pocket Load

This setup tells the controller not to allow any more than the programmed weight per pocket.

Calibration Maximum Weight Counts

This setup is used only during calibration of the load cells.

The analog input from the load cells is converted to a numeric value ranging from 0 - 4095 counts. Full output from the load cells (20 mA) would correspond to 4095 counts.

When the operator is prompted to "Place Calibration Weight in Pkt. #1", he places the weight in the pocket and presses the ENTER key.

If the load placed in the pocket is greater than it should be (Calibration weight counts will be greater than Max value as defined in the setup) then the operator would get an error message: "Pocket Over Loaded.... Reduce Load!"

The Calibration MaxWt Counts will have to be determined at set up of the conveyor. The max counts will depend on the weight of the conveyor on the load cells, the max pocket load, and the capacity of the load cells. **PLEASE CONTACT SOFTROL SYSTEMS, INC. BEFORE ALTERING THIS SETUP.**

Select Shuttle ID#

This is the ArcNet ID of the shuttle to be loaded by the Pocket Loader Conveyor.

2= Passwords

By pressing 2, you can view and edit the level seven password. To change the passwords, a valid level 7 password must be entered. From the Waiting to Load screen enter a valid level 7 password. Select 1=Setup. Select 2=Passwords. Using the arrow keys, scroll to the password that needs to be changed or viewed. A password consists of 1 to 6 numbers. Examples are 1 or 080499. Using a six-digit password is recommended.

3=Calibrate Ld Cells

By pressing 3, you enter the calibration menu.

CALIBRATE- Load Cell
1= Calibrate
2= Check Known Wts
NO=Exit

1= Calibrate

Pressing this prompts the operator to answer the following:

CALIBRATE- Load Cell
Is Pocket #1
Completely Empty?
ENTER=accept

If the pocket is not empty, press the [NO] key, empty the pocket then proceed with calibrating. If the pocket is empty, press the [ENT] key.

CALIBRATE- Load Cell
Calibration Weight
Pounds = 0
ENTER=accept

Enter the weight that you are calibrating. For example, if you are calibrating a weight of five hundred and fifty two pounds, enter 5 5 2.

The operator will then be prompted the following:

CALIBRATE- Load Cells
Place calibration
Weight in PKT #1
ENTER=accept

Place the weight into the pocket and press the [ENT] key. If the calibration is successful, the control will prompt the operator the following:

Calibration OK
ENTER=accept

If the calibration was unsuccessful the operator will be prompted the following:

Counts/lb is not
within
Allowed Range!

Press the [NO] key and check the setups.

2=Maintenance

The following will be displayed:

1=Test Inputs
2=Test Outputs
3=Board Responses
0=Exit

1=Test Inputs

Pressing this, you can view the input status. Following is a list of the inputs. By using the arrow keys, you can scroll through the list.

S101-Control Power On
S102-Pocket Position
S103-1/2 Pocket Position
S104-Advance 1 Pocket
S105-End Loading
S106-Advance 1/2 Pocket
S107-Emergency Stop OK
S108-Drive System OK
S109-Manual is ON
S110-Request Belt Move Positive
S111-Request Belt Move Negative
S112-Request Belt Run Empty
S113- Reserved Input
S114- Reserved Input
S115-Reserved Input
S116-Reserved Input

2=Test Outputs

Pressing this, you may check the output status. Following is a list of the outputs. By using the arrow keys, you can scroll through the list. By Pressing the [YES} key, you may toggle the output on and off.

R101-Belt Forward
R102-Belt Reverse
R103-Under Weight (Amber)
R104-Within Range (Green)
R105-Over Weight (Red)
R106-Calculate Weight (Blue)
R107- Reset VFD
R108- Control Alarm

3=Board Responses

Pressing this, you may view the board responses. Following is a list of the boards (Racks). A no Response = 0 tells us that the rack is communicating properly. By using the arrow keys, you can scroll through the list.

I/O Rack #1
I/O Rack #2
I/O Rack #3
I/O Rack #4
I/O Rack #5
I/O Rack #6
I/O Rack #7
I/O Rack #8

3=Clock

To set the clock, enter a valid level 7 password from the main screen.

Date= 00:00:00
Enter New Date
Date= 00:00:00
ENTER= Accept No= exit

Enter the day, month, and year. For example the date is July 4, 2007 press [0][8][0][4][0][7].

Date= 00:00:00
Enter New Date
Date= 08:04:07
ENTER= Accept No= exit

Press [ENT].

Time= 00:00:00
Enter New Time
Time= 00:00:00
ENTER= Accept No= exit

The clock is in a 24-hour format also known as European. Enter the hour, minutes, and seconds. For example, if the time is 3:15:33 PM, press [1][5][1][5][3][3].

Time= 00:00:00
Enter New Time
Time= 15:15:33
ENTER= Accept No= exit

Press [ENT].

Override Displays

The AutoPulse Single Pocket conveyor system offers a set of diagnostic override displays that provide information about the system to aid in troubleshooting. The following list outlines the override displays and summarizes the function of each one. Press the up and down arrow keys simultaneously to display the overrides. Use the arrow keys to scroll.

Screen #1

Displays the status of each point (input or output) in Rack #1 and Rack #2. A constant of (1) is on and a (0) is off. Line three displays if the control is in automatic, the constant will read (1). If the control is in manual, the constant will read (0). Line four displays the current machine status and the selected machine status. Press the up arrow key to scroll to screen two.

```
Rack #1    Rack #2
00000000  00000000
System in Auto =0
MSat=00 SellStat=00
```

Screen #2

Displays the status of each point (input or output) in Slot #1 and Slot #3. A 1 is on and a 0 is off.

```
Slot 1 1-16 Inputs
00000000 00000000
Slot 3 1-16 Inputs/Outputs
00000000 00000000
```

Screen #3

This screen displays on line one when the control is broadcasting a request (waiting for load or unload) over the network and also the machine sequence. Line two displays when the control is sending or receiving the data record. Line three displays when the data record is being sent to the printer or PC. Line four displays the ArcNet ID in hexadecimal of the machine being loaded or unloaded.

```
ExtCast=0  MachSeq=0
GetDRec=0  SndDrec=0
DataRec to Printer =0
Private Link ID = 0
```

Screen #4

This screen displays on line one the programmed unload sequence. Line two displays the item code and the customer code. Line three displays the destination and lot number. Line four displays the dryer classification and the dry formula number.

```
DATAREC ULPrm = 0
I = 0          C = 0
D = 0          L = 0
DClass=00     Dform=00
```

Screen #5

This screen displays on line one the status of the AIO420 card located in slot two, channels one and two. Line two displays status of the AIO420 card located in slot two, channels three and four.

```
Ai 1 = 000000    2 = 000000
Ai 3 = 000000    4 = 000000
```

Screen #6

This screen is for Softrol troubleshooting.

```
Foreground Sta=0
Cast1 Sta Ptr = 0
Ptr #1 = 0
(blank line)
```

Screen #7

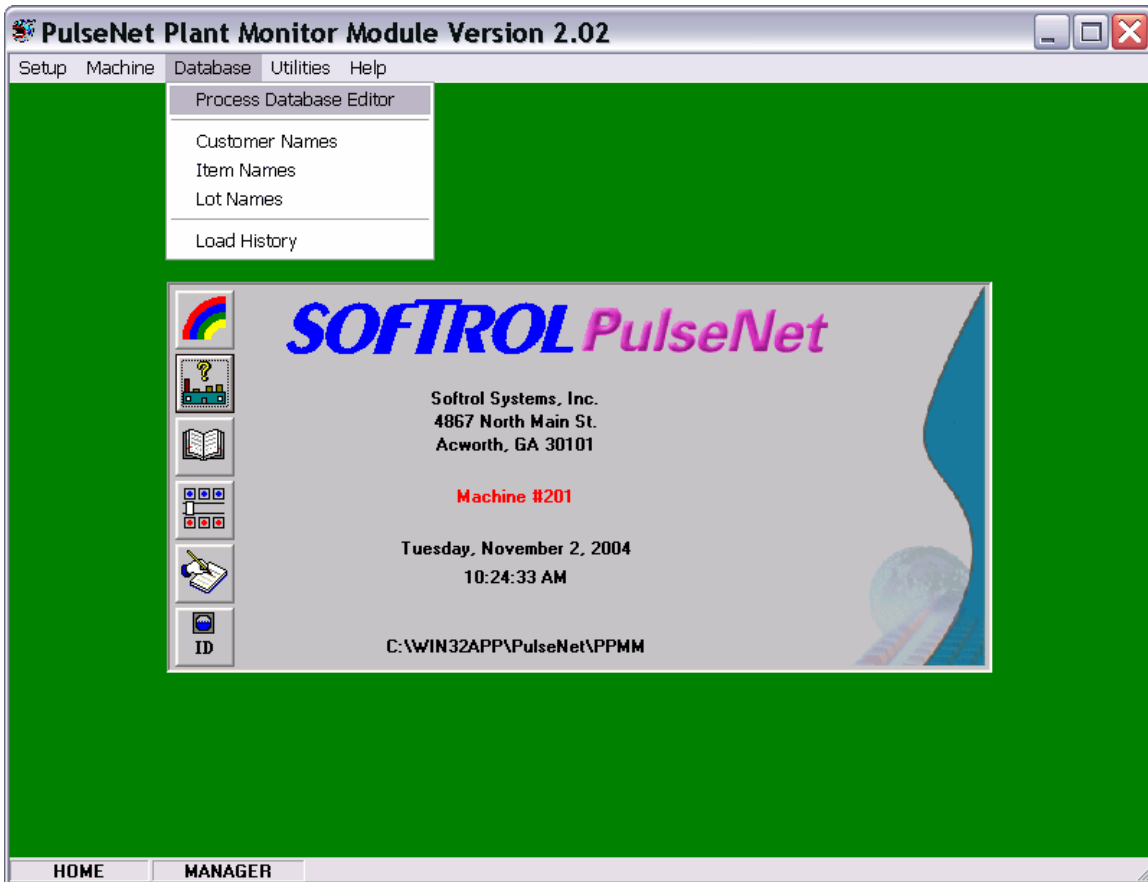
This screen displays the Backscans, software date, ArcNet ID, and software name, version, and revision numbers.

```
Bacscans = 123456
ArcState = 0
01-29-2007 ID# 0
SOFTPK V3.0 R0.0
```


Loading Database

The Loading Conveyor Database must be setup and on line before the 1 to 5 Pocket Loading Conveyor can be operated as a part of the Softrol Plant Monitor (PPMM) automated network. When the Loading Conveyor operator presses the **[ENT]** key from the **Automatic / Stand By** mode to begin the conveyor pocket loading sequence, the operator is immediately prompted for the Item Number (**Item Code**). The item number is the key for identifying the specific Loading Conveyor Data Record for the load of goods to be processed. The Loading Conveyor Data Record contains all the necessary information for directing the load to be processed to the proper machines and to provide these machines with the formula numbers and other necessary information for processing this load. To create the Database for Items, go to the Softrol Plant Monitor and review the on line manual.

To setup the database, please refer to your PPMM manual found inside your program under the Help menu.



The database needs to be programmed by the user prior to starting the system (Initial setup of the automated system).

- 1- Description
- 2- Item
- 3- Lot [AKA Day Code]
- 4- Count
- 5- Desired Weight A
- 6- Desired Weight B
- 7- Weight Tolerance
- 8- Wash Class
- 9- Wash Formula
- 10- Dry Class
- 11- Dry Formula
- 12- Customer
- 13- Destination

Description

Description is a way of tracking the goods throughout the system.

Item

This number that is assigned to each sling that is to be processed. It is recommended that each different product have a different item code i.e., Mats item code 4 and Shop Towels item code 8.

Lot

Lot is a way for the user to track goods throughout the system.

Count

If you are processing 520 pieces, this number will be added to the data record. This data follows the load through the process and is shown on the process report.

Desired Weight A

This is the desired weight of the formulation that you wish to process. If your ideal load size is 800 pounds, this will need to be programmed **800**.

Desired Weight B

This is used only if there are two weighing devices i.e. weighing conveyors and is programmed identical to the prior.

Weight Tolerance

This is programmable to make your operation more efficient and to correspond with your formulation chemistry. If your desired weight is 500 pounds and you do not want to process over 525 pounds or fewer than 475 pounds this number would be **25**.

Wash Class

This is the class type of the machine. The valid range is 0 to 94. Certain machines may be equipped differently than other machines. In addition, certain processes may be preferred in particular machines. This is accomplished through using the Class Type. When items to be processed are entered into the system, they are assigned a Class Type Number for the Wash Classification. The corresponding items will be processed in a machine with a matching Class Number. Assigning a Machine Class Type 99 will prevent the machine from automatic operation and is useful when maintenance or testing is performed on a machine. On bag-loaded systems, the Machine Class Type corresponds to the Queue number of the rail system that will load the machine. In this case, if there are four different rail queues loading machines, then the machines will have either a Machine Class Type 1, 2, 3, or 4 respectively. All machines serviced by a rail queue must be capable of processing the same items.

Wash Formula

This is the formulation number that is assigned to the product that you are processing.

Dry Class

This is the class type of the machine. The valid range is 0 to 94. Certain machines may be equipped differently than other machines. In addition, certain processes may be preferred in particular machines. This is accomplished through using the Class Type. When items to be processed are entered into the system, they are assigned a Class Type Number for the Dry Classification. The corresponding items will be processed in a machine with a matching Class Number. Assigning a Machine Class Type 99 will prevent the machine from automatic operation and is useful when maintenance or testing is performed on a machine.

Dry Formula

This is the formulation number that is assigned to the product that you are processing.

Customer

Customer is a way for the user to track goods throughout the system.

Destination

Destination is a setup to tell the dryer unloading conveyor where to take the load for sorting. For example if you have a sort station on both ends of the dryer unload conveyor, you program this number to correspond with the negative or the positive end of the belt. ***(See post process range for dryer unloading belts.)***

Loading/Unloading Parameters

Washer-Load Belt *(Only Valid on Non-Sling Loaded Systems)*

On - This tells the shuttle loading the washer, ***(soil shuttle)*** how long to pause the indexing of the belt while the washer.

Off - This tells the shuttle how long to turn the belt off during the indexing.

- **First Extension** - If checked, this tells the shuttle to use the first extend into the washer input until the discharge photo-eye shows clear then extend into the second extend to washer input.



The shuttle is the heartbeat of the AutoPulse Automation System. It allows or disallows automatic movement of the entire wash isle. Shuttles can be configured in many different ways. Incline, L Type, or Scissors. The incline shuttle can be configured with one bed or two. It can be configured with one soiled bed and one clean bed. It can be configured with two clean beds. In this configuration, we determine the two beds by Bed A and Bed B. Bed A is always the clean or dryer loading bed. On shuttles with two clean beds, bed A should always be the most positive bed while facing the dryers.

Shuttle AutoPulse Setups

Before a shuttle can be incorporated into an AutoPulse Automation System, the AutoPulse setups on the shuttle must be entered. These AutoPulse setups contain the important operation information necessary for proper operation of the AutoPulse Automation System.

To enter the shuttle setups, from the reset menu, enter a valid programmed password.

- 1 = Manual 2 = Resume
- 3 = Reset Auto Only
- 4 = Reset & Position

Passwords are programmed on the shuttle in the same manner as passwords are programmed on the Washers and Dryers. The control should respond by displaying the following:

- 1=Setups
- 2=Calibration
- 3=Set Clock

Select setups to set up the shuttle system.

Negative Stop Pos.

The Stop Position is the farthest position to the left that the shuttle should be allowed to travel. This position is indicated by metal bars placed on the floor or photoelectric sensors for the shuttle system to sense. For most single shuttle systems, this should be programmed as 0.

(Shuttle #1 = 0 | Shuttle #2 = 1)

Positive Stop Pos.

The Positive Stop Position is the farthest position to the right that the shuttle should be allowed to travel. This position is indicated by metal bars placed on the floor or photoelectric sensors for the shuttle system to sense.

(Shuttle #1 = 21 | Shuttle #2 = 22).

Home Position

The Home Position is the position that the shuttle goes to when it has nothing to do. The home position must be located to allow unrestricted movement of washers and their doors and/or chutes when the shuttle is in this position.

(Shuttle #1 = 5 | Shuttle #2 = 15)

Load Position

The Load Position is the position that the shuttle goes to when a manual load shuttle operation is requested and items to be processed are loaded onto the shuttle manually. The load position must be located to allow unrestricted movement of washers and their doors and/or chutes when the shuttle is in this position.

(Shuttle #1 = 0 | Shuttle #2 = 22)

Origin

Origin tells the shuttle control whether the Origin is Positive (far right) or Negative (far left). If Negative is selected, the shuttle will always travel negatively when reset. If Positive is selected, the shuttle will always travel positively when reset. Press the YES key if the shuttle's origin is positive or press the NO key if the origin is negative.

(Shuttle #1 = NEG | Shuttle #2 = POS.)

Bed A Plus Stop Pos.

This setup is for negative origin shuttles that have two clean beds. This indicates to the shuttle the most positive position that Bed A can service.

(Shuttle #1 = 18)

Bed B Neg. Stop Pos.

This setup is for positive origin shuttles that have two clean beds. This indicates to the shuttle the most negative position that Bed B can service.

(Shuttle #2 = 6)

No-Dry Sta. #1

If No-Dry Station #1 exists, press YES. If not, press NO. A no-dry station is a location where the shuttle unloads processed items without processing them in a dryer. Up to 5 no-dry stations may be defined. Five inputs are provided for enabling of the no-dry stations if desired. Items will not be unloaded to the no-dry station if the enable input is off.

(Shuttle #1 / #2 = NO)

No-Dry Station #1 / Position #

If a no-dry station is to be utilized, the position number defines where the shuttle is to unload the processed items.

(Shuttle #1 = 0 | Shuttle #2 = 22)

No-Dry Station #1 / Class = (95-99)

This is the Class Type to be used by the no-dry station. This must be a number from 95 to 99. It may be desirable for certain processes or fabric types to be delivered to particular no-dry stations. This is accomplished through using the Class Type. When items to be processed are entered into the AutoPulse system, they are assigned a Class Type Number for the Dry Classification. The corresponding items will be directed to a no-dry station with a matching Class Number.

(No Dry Sta. #1 – Shuttle #1 / #2 = 95)

No-Dry Sta. #2 - #5 – Enter the same setup information for No-Dry Stations 2-5.

(No-Dry Sta. #2 – Shuttle #1 / #2 = 96)

(No-Dry Sta. #3 – Shuttle #1 / #2 = 97)

(No-Dry Sta. #4 – Shuttle #1 / #2 = 98)

(No-Dry Sta. #5 – Shuttle #1 / #2 = 99)

Priority

1=Washers 2=Dryers

Press 1 if the shuttle is to give washers loading priority or press 2 if the dryers should have loading priority. Decisions by the shuttle will be given preference according to the programmed priority.

(Shuttle #1 / #2 = WASHER)

Loading Washer / Belt ON Time

Belt On Time is the time (in seconds) that the conveyor belt should run for each step when loading a washer

(Shuttle #1 / #2 = 99)

Loading Washer / Belt OFF Time

Belt Off Time is the time (in seconds) that the conveyor should wait between each step when loading a washer.

(Shuttle #1 / #2 = 0)

Unloading Washer / Delay at Unload

Delay at Unload is the time (in seconds) that the conveyor should wait after the washer has started unloading to begin moving the load up the conveyor.

(Shuttle #1 / #2 = 8)

Unloading Washer / Belt On Time

Belt On Time is the time (in seconds) that the conveyor belt should run for each step when unloading a washer.

(Shuttle #1 / #2 = 2)

Unloading Washer / Belt Off Time

Belt Off Time is the time (in seconds) that the conveyor should wait between each step when unloading the washer.

(Shuttle #1 / #2 = 5)

Unloading Washer / Belt Full Delay

Belt Full Delay is the time (in seconds) that the conveyor belt should wait when unloading a washer after items have passed the eye to ensure that all items have been unloaded.

(Shuttle #1 / #2 = 10)

Declare Belts Empty

Declare Belts Empty is the time (in seconds) that the belt should continue to run after the last item has passed the eye when loading a dryer.

(Shuttle #1 / #2 = 10)

Loading Dryer / Belt On Time

Belt On Time is the time (in seconds) that the conveyor belt should run for each step when loading a dryer.

(Shuttle #1 / #2 = 99)

Loading Dryer / Belt Off Time

Belt Off Time is the time (in seconds) that the conveyor should wait between each step when loading a dryer.

(Shuttle #1 / #2 = 1)

Preferred Range Lo

Preferred Range Lo is used to assign the low position that determines the preferable range for the shuttle to operate. Decisions by the shuttle will be given preference according to the programmed range.

(Shuttle #1 = 0 | Shuttle #2 = 11)

Preferred Range Hi

Preferred Range Hi is used to assign the high position that determines the preferable range for the shuttle to operate.

(Shuttle #1 = 10 | Shuttle #2 = 22)

Approaching Position / Key in Counts

Approaching Position allows control of the shuttle speed so that it can slow down when approaching a target. The correct entry will result in the shuttle reducing its speed before reaching the approaching target. If the shuttle has to back up to positions, the counts should be increased. If the shuttle slows down too early, the counts should be decreased.

(Shuttle #1 / #2 = 1500)

Two Shuttle Net

Press YES if there are two shuttles. Press NO if only one shuttle is used. When two shuttles share the same rail on a system, the Two Shuttle Net setup must be enabled. The two shuttles will communicate with each other important safety and position information.

(Shuttle #1 / #2 – YES)

Two Shuttle Net / Safe Pos. Shuttle #1

To establish a safe minimum distance to be maintained between the two shuttles, two established positions are entered where the two shuttles are at a safe distance apart. Safe Pos. Shuttle #1 is the position number that shuttle #1 (always the negative origin shuttle) can be positioned safely.

(Shuttle #1 / #2 = 11)

Two Shuttle Net / Safe Pos. Shuttle #2

Safe Pos. Shuttle #2 is the position number that shuttle #2 (always the positive origin shuttle) can be positioned safely.

(Shuttle #1 / #2 = 12)

Two Shuttle Net / Calibrated To Pos. #

For shuttle #1, this is the farthest positive position that the shuttle is calibrated for. For shuttle #2, this is the farthest negative position that the shuttle is calibrated for. (Shuttle #1 = 21 | Shuttle #2 = 1)

Two Shuttle Net / Other Shuttle ID #

For each of the shuttles, the other shuttle's ID number is necessary for communication purposes

(Shuttle #1 = 202 | Shuttle #2 = 201)

Belt Photo-Eye Delay / Min. Belt Time

Minimum Belt Time is the time (in seconds) that the conveyor should run the belt when loading. The belt full indication will be ignored during this time.

(Shuttle #1 / #2 = 10)

Belt Photo Eye Delay / Eye Block Delay

Eye Block Delay is the time (in seconds) that the conveyor should run the belt after sensing that the belt is full. The belt full indication will be ignored during this time.

(Shuttle #1 / #2 = 3)

The following elevation/depth setups are only on Scissors Type Shuttles.

Scissors type shuttles can have washers only on the washer isle, but dryers and washers are allowed on the dryer isle and can only be automatically unloaded in this direction. A push button wired to the front panel input FPD4 (Mirror Washer Select) and pressing the button will allow the shuttle to manually unload a mirrored washer.

C1 Elevation – Depth / C1 Max. Elevation

This should be the maximum value of the height counter sensor for conveyor 1. The proximity switch that indicates the extent of travel will set the elevation to the programmed value.

(Shuttle #1 / #2 = 50)

C1 Elevation – Depth / C1 Pos. @ Center

This should be the value of the depth counter sensor for conveyor 1 when positioned in the center travel position. The proximity switch that indicates the center travel position will set the depth to the programmed value.

(Shuttle #1 / #2 = 21)

C1 Elevation – Depth / C1 Pos. @ Extend

This should be the value of the depth counter sensor for conveyor 1 when positioned in the North extent position. The proximity switch that indicates the North extent position will set the depth to the programmed value.

(Shuttle #1 / #2 = 47)

C2 Elevation – Depth / C2 Max. Elevation

This should be the maximum value of the height counter sensor for conveyor 2. The proximity switch that indicates the extent of travel will set the elevation to the programmed value.

(Shuttle #1 / #2 = 50)

C2 Elevation – Depth / C2 Pos. @ Center

This should be the value of the depth counter sensor for conveyor 2 when positioned in the center travel position. The proximity switch that indicates the center travel position will set the depth to the programmed value.

(Shuttle #1 / #2 = 21)

C2 Elevation – Depth / C2 Pos. @ Extend

This should be the value of the depth counter sensor for conveyor 2 when positioned in the North extent position. The proximity switch that indicates the North extent position will set the dept to the programmed value.

(Shuttle #1 / #2 = 47)

ArcNet Node ID #

This is the unique ID number for the shuttle in the AutoPulse System. Valid ID numbers are 1 to 254. ID #255 is reserved for AutoPulse Plant Monitor (PPMM or PPMM) database. On an AutoPulse system with one shuttle this ID number is usually 201.

(Shuttle #1 = 201 | Shuttle #2 = 202)

Database Node ID #

This is the required ArcNet ID number for the PulseNet Plant Monitor (PPMM or PPMM) database.

(Shuttle #1 = 255 | Shuttle #2 = 255)

Calibration

After setups have been performed and if all of the shuttle position markers are in place, the shuttle can then be calibrated. To enter the shuttle setups, from the reset menu, enter a valid programmed password.

1=Setups
2=Calibration
3=Set Clock

Select calibrations to calibrate the shuttle system.

If all shuttle safeties are O.K., the shuttle will move all the way to its origin (negative or positive) and begin an automatic calibration of the system.

The shuttle will travel along the rails counting position markers and storing the relative encoder values for each position. Once the shuttle reaches the end of the rails it will report if the calibration was successful or not. If the calibration was not successful, check for incorrect values in the shuttle setups. The shuttle may not have sensed all of the position markers as it passed them because of marker positioning or sensor adjustment. Something on the floor may have caused the shuttle to count more positions than the shuttle setups indicate.

Set Clock

The shuttle control has an internal clock that is used to time and date-stamp the PPMM Data Records. To enter the shuttle setups, from the reset menu, enter a valid programmed password.

1=Setups
2=Calibration
3=Set Clock

Select set clock to set the shuttle system.

Use the keypad to enter the correct date and time (in 24-hour format).

Safety Reset

Shuttle operation is disabled until the system-reset button is pressed. The system reset will be successful if all shuttle safeties are simultaneously satisfied. If a particular safety is not O.K., the control interface display will indicate the problem. Possible problems are:

24 VAC Power Fault

Check the 24 VAC control circuit fuse.

E-Stop #1 Fault

The Emergency Stop on the shuttle is pressed.

Motor Drive Fault

The variable speed drive has a fault.

Motor O.L.'s Fault

The motor overloads need reset.

Side Bar Sw. Fault

One or both of the safety sidebars need reset.

E-Stop #2 Fault

The Emergency Stop on the podium is pressed.

Aux. Safeties Fault

The Auxiliary Safeties circuit has a fault.

Position out of Zone

A position marker was encountered but not within the calibrated zone for that position. The calibrated zone for a position is defined as the encoder count stored for that position +/- the Approaching Position Counts. The shuttle expects to see the position within the defined validation zone. This usually is caused by metal within the floor (rebar) or metal objects on the floor or if using photoelectric positioning, false reflections usually from machine bases.

Zone Without a Pos.!

A position marker was expected but not encountered within the calibrated zone for that position. The marker being too far from the sensor or being out of center from the sensor usually causes this. The marker can be raised with additional washers or repositioned to be on center of the travel of the sensor.

Unexpected End Pos.!

This occurs when an end position marker is encountered without also having the slow down marker encountered. This usually is caused by metal within the floor (rebar) or metal objects on the floor or if using photoelectric positioning, false reflections usually from machine bases.

Other Shuttle

On systems utilizing two shuttles, this error occurs when the other shuttle has a safety fault.

Suspend Auto

The Suspend Auto Input has been made.

Wash Perimeter Fault

On shuttles utilizing the Laser Perimeter Safety Scanners, this occurs when someone is inside the zone on the washer end of the shuttle.

Dry Perimeter Fault

On shuttles utilizing the Laser Perimeter Safety Scanners, this occurs when someone is inside the zone on the dryer end of the shuttle.

Press Safety Reset

All series safeties are O.K. and pressing the safety reset will enable shuttle operation.

If the safety reset is successful, the shuttle control display will respond by displaying the following menu:

System Restart Menu

- 1 = Manual 2 = Resume
- 3 = Reset Auto Only
- 4 = Reset & Position

Manual Operation (From Menu)

The shuttle control functions can be checked out or operated manually from the control panel. To access the manual shuttle functions, select Manual from the System Restart Menu. The manual shuttle functions are selected from three groups of menus:

- 1=Shuttle Movements
- 2=Soil Conveyor Select or Conv. A Select
- 3=Clean Conveyor Select or Conv. B Select

Shuttle Movements

The shuttle can be moved in the negative or positive direction by pressing the respective function. A destination can also be entered for the shuttle to automatically move to. Positive and Negative shuttle movement can only be performed when the conveyors are at the travel (center) position.

- 1 = Move Shuttle Neg.: Moves shuttle negative
- 2 = Move Shuttle Pos.: Moves shuttle positive
- 3 = Enter Destination: Move shuttle to entered position

Clean Conveyor or A Conveyor Select

Selecting the following respective function can operate Movements of the Clean (Load Dryer or Bed A) Conveyor:

- 1 = Dryer: Moves soil conveyor toward dryer
- 2 = Center: Moves soil conveyor from dryer to center
- 3 = Wash: Moves soil conveyor toward washer
- 4 = Center: Moves soil conveyor from washer to enter
- 5 = Belt: Moves soil conveyor belt
- 6 = Belt: Opposite direction (Scissors Shuttle Only)
- 7 = Close Both Flaps (Scissors Shuttle Only)
- 8 = Open Wash Flaps (Scissors Shuttle Only)
- 9 = Open Dry Flaps (Scissors Shuttle Only)
- Up Arrow = Move Conveyor Up (Scissors Shuttle Only)
- Down Arrow = Move Conveyor Down (Scissors Shuttle Only)

Soil Conveyor (if applicable) or B Conveyor Select

Selecting the respective function can operate Movements of the Soil (Load Washer or Bed B) Conveyor:

- 1 = Dryer: Moves clean conveyor toward dryer
- 2 = Center: Moves clean conveyor from dryer to enter
- 3 = Wash: Moves clean conveyors toward washer
- 4 = Center: Moves clean conveyor from washer to center
- 5 = Belt: Moves clean conveyor belt
- 6 = Belt: Opposite direction (Scissors Shuttle Only)
- 7 = Close Both Flaps (Scissors Shuttle Only)
- 8 = Open Wash Flaps (Scissors Shuttle Only)
- 9 = Open Dry Flaps (Scissors Shuttle Only)
- Up Arrow = Move Conveyor Up (Scissors Shuttle Only)
- Down Arrow = Move Conveyor Down (Scissors Shuttle Only)

Automatic Operation

Automatic operation of the shuttle is entered via the System Restart Menu.

System Restart Menu

1 = Manual 2 = Resume

3 = Reset Auto Only

4 = Reset & Position

The method for beginning automatic operation will depend on the circumstances at system startup. The following guidelines will result in proper startup of the system.

Resume

When Resume is selected, the shuttle simply continues the last action when automatic operation was interrupted.

On systems with two shuttles, the other shuttle may be started and resumed by pressing the [2] and [ENT] keys simultaneously. This is very useful in situations where one shuttle's safety has reset the other shuttle. Both shuttles can then resume their previous actions.

Reset Auto Only

When Reset Auto Only is selected; the shuttle first checks its belts to see if any items are loaded onto the shuttle.

If items are detected, the data record processing information will have to be entered and verified before resuming automatic operation. This operation is useful to review of change the processing information for items on the shuttle.

1 = Wash Process Data:

Selects washer process data for entry

Class # =: Key in Wash Class

Formula # =: Key in Wash Formula

2 = Dry Process Data:

Selects dryer process data for entry

Class # =: Key in Dryer Class

Formula # =: Key in Dryer Formula

3 = Item Specific Data:

Selects item specific data for entry

Item #: Key in Item Number

Lot #: Key in Lot Number

Customer #: Key in Customer Number

Count: Key in Item Count

Weight: Key in Item Weight

Destination: Key in Post. Dest.

Rest & Position

When Reset & Position is selected, the shuttle performs the same reset as in Reset Auto Only. In addition, the shuttle moves to its programmed origin extent to reset the known position. After moving to the origin extent, the shuttle then moves to the programmed home position. This function is the safest way to rest the system to automatic.

Automatic Sequence

Once automatic operation has been reset, the shuttle begins checking machinery for loading / unloading needs.

The status of the shuttle is displayed on the Control Interface. The load washer shuttle conveyor can be loaded manually or automatically, loaded from a conveyor, and loaded from a bag system.

Once loaded, the shuttle will attempt to load a washer that meets the processing needs of the items on the shuttle conveyor. The load dryer shuttle conveyor can be loaded manually or loaded from a washer. Once loaded, the shuttle will attempt to load a dryer or no-dry station that meets the processing needs of the items on the shuttle conveyor. For No-dry/bypass conveyors, a dryer classification from 60 to 69 will allow all shuttles to respond. Dryer classifications 70 to 79 will allow only negative end shuttles to respond. Dryer classifications 80 to 89 will allow only positive shuttles to respond.

Automatic operation may be exited by pressing the [CLR] and [ENT] keys simultaneously. The shuttle control display should respond by displaying the System Restart Menu.

Additionally, if any of the safeties are interrupted during automatic operation, the system will exit automatic operation and display the fault. After fixing the fault, the shuttle control display should respond by displaying the System Restart Menu.

When the system is in automatic, turning the Load Shuttle switch on the side of the loading position podium to the on position causes the shuttle to come to the loading position when its conveyor is empty.

Alternatively, pressing and holding the [NO] and [ENT] keys simultaneously from either keypad will also cause the shuttle to come to the loading position. If the Database ID = 255, the shuttle will travel to its programmed loading position, retract the conveyor bed and prompt the operator for the item code of the desired load. When the shuttle is in the load position the up arrow key may be used to move the conveyor belt while loading. When loaded, pressing the [YES] and [NO] keys simultaneously will end the loading sequence.

If the Database ID = 0, when the conveyor is loaded the AutoPulse data record should be entered. The data record entry menu is outlined below.

1 = Wash Process Data

Selects washer process data for entry

Class # =: Key in Wash Class

Formula # =: Key in Wash Formula

2 = Dry Process Data

Selects dryer process data for entry

Class # =: Key in Dryer Class

Formula # =: Key in Dryer Formula

3 = Item Specific Data

Selects item specific data for entry

Item #: Key in Item Number

Lot #: Key in Lot Number

Customer #: Key in Customer Number

Count: Key in Item Count

Weight: Key in Item Weight

Destination: Key in Post. Dest.

After the AutoPulse data record has been entered press the [YES] and [NO] keys simultaneously for the shuttle to accept the load.

Suspend Motion

The automatic movement of the shuttle may be suspended by pressing the stop button (not the Emergency Stops). When the shuttle is in this state, all other equipment remains in automatic mode. The shuttle conveyor belts are the only things on the shuttle that are allowed to move while movement is suspended. To resume normal automatic operation the start automatic button is pressed. The shuttle will sound its buzzer and flash its lights for 10 seconds before resuming automatic movements.

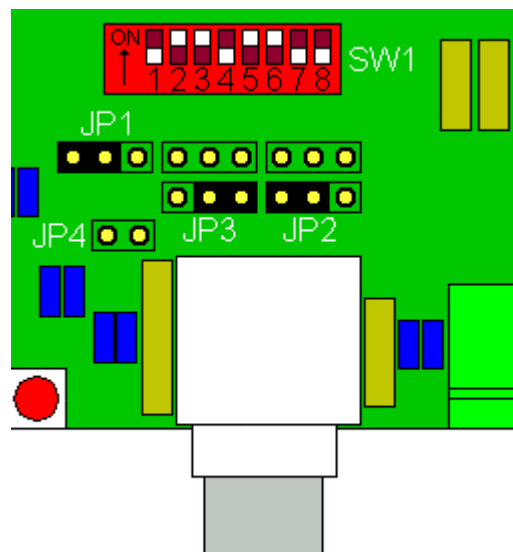
Shuttle Communications

The shuttle communicates over an ArcNet network to a remote podium with an ARCFIBER card located in slot 5 and to the ModHub ARCFIBER card located in slot 6. The ARCFIBER cards contain an ArcNet Media. The ArcNet Media controller can drive three different types media depending on the jumper configuration. One ArcNet Media is Twisted-pair Communication (TP). To use the TP communications, the card must be jumpered as follows; viewing the ARCFIBER name to your right, JP1 need pins 1 and 2 jumped. JP2 needs both sets of pins 1 and 2 jumped. JP3 needs both sets of pins 1 and 2 jumped. Please note, that if the machine is at the end of the communication loop, JP5 needs to be jumped also.

The second ArcNet Media is COAX Communication. This type of media is not used on shuttles using a festoon type electrical connection.

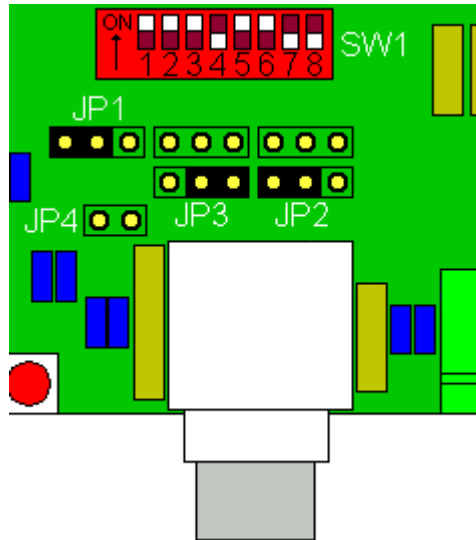
The final ArcNet Media is Fiber Optic Communication (FO). To use the FO communications, the card must be jumpered as follows: viewing the ARCFIBER name to your right, JP1 need pins 2 and 3 jumped, JP2 needs the top set of pins 2 and 3 jumped, and JP3 needs the top set of pins 1 and 2 jumped. Software must configure the ArcNet controller for back plane mode to properly transmit and receive.

On systems where the machine is connected to a PulseNet network, this board needs to be set so that each individual machine establishes its own identity that is known as the Node ID. To do this the ARCFIBER card needs to be set up. The Node ID for the board is setup by setting the 8-position Dipswitch to the proper binary code representing the particular node number from 0 to 255. The switches are numbered 1 through 8 with 1 being the least significant bit of the node. The ON position represents a logic 0, the OFF position represents logic 1. For example, shuttle ID numbers generally start with ID 201 for the Negative end shuttle and 202 for the Positive end shuttle. To set the node ID as 201 first convert the decimal to binary, then determine the switch positions. The following example is an ARCFIBER card set for the Fiber Optic Communication method with an ID of 201.



Switch #	1	2	3	4	5	6	7	8
Decimal	1	2	4	8	16	32	64	128
Binary	Off	On	On	Off	On	On	Off	Off

Both ARCFIBER cards (slot 5 and 6) should be set to the same identification number. The slot 6 card in the Podium should be connected to the slot 5 card in the shuttle. The ID for the Podium should be one less than the shuttle. Meaning, if the shuttle ID is set for 201, the Podium ID must be 200. Please view the following example:



Manual Operation (Pushbuttons)

The shuttle may be operated in full manual mode. To perform this task, press the Suspend pushbutton (PB). Switch the Auto/Manual selector switch to Manual. In this mode, you may press the Function PB and the corresponding pushbutton to perform certain tasks.

Pressing the Function plus Move Negative to move the shuttle in the Negative direction.

Pressing the Function plus Move Positive to move the shuttle in the Positive direction.

Pressing the Function plus Conv. A to Wash retracts conveyor A toward the washers.

Pressing the Function plus Conv. A to Dryers extends conveyor A towards the dryers.

Pressing the Function plus Conv. A Belt to index the belt on conveyor A.

Pressing the Function plus Conv. B to Wash retracts conveyor B toward the washers.

Pressing the Function plus Conv. B to Dryers extends conveyor B towards the dryers.

Pressing the Function plus Conv. B Belt to index the belt on conveyor B.

The following will show a few watchdogs and how to help to prevent them.

Washer Watchdogs

Level Halt High

A Level Halt High usually indicates a water inlet that is not closing or a programming error in the formula. (i.e. Fill Hot 45.0 " with Level Halt High programmed at 30.0 ") Fill Cold Watchdog. To cancel this watchdog, enter a valid six-digit password for example "777777", and then press the [YES] key on the FPD. This will allow the machine to continue pending that there are no problems with the air compressor, the water supply system, and the water valve itself, or the drain being stuck open. There are many more variables that can cause this. These are just a few examples.

Chemical Watchdog Chemical 1

To cancel, enter your six-digit password and press [YES] on the FPD. This will allow the machine to continue pending there are no problems with something restricting the chemical flow. Check the washer setups to insure that the Auto Chemical Flush is properly set. Check to see if the chemical system is turned on. Most of the time this fault is caused by an interruption of the communication with the chemical system and the washer. These are just a few examples.

Steam Watchdog

To cancel, enter your six-digit password and press [YES] on the FPD. This will allow the machine to continue pending there are no problems with something restricting the steam from flowing. Check the air compressor. Check the boiler to make sure that it is working properly. Check the steam valve itself. These are just a few examples.

These are a few examples of some watchdogs and how to clear and investigate them.

The following will show a few watchdogs and how to help to prevent them.

Dryer Watchdogs

Hi Outlet Temp

To cancel this watchdog, enter your six digit password for example “7777777”, and then press the [YES] key on the FPD. This will allow the machine to continue pending that there are no problems with the intake filters or the actual temperature probe. These are just a few examples.

Basket Not Rotating

To cancel this watchdog, enter your six-digit password and then press the {YES} key on the FPD. This will allow the machine to continue pending that there are no problems with the drive belts or motor. Check to see if the existing load was properly extracted.

Gas Pressure Error

To cancel this watchdog, enter your six-digit password and then press the [YES] key on the FPD. This will allow the machine to continue pending that there are no problems with the actual gas pressure going into the machine. Maybe there is some air in the gas line.

The dryer is in the unload position and the front door is not open. Place the machine into the manual state and clear any debris from the rear door. Check the rear door closed switch to make sure that it is working properly.

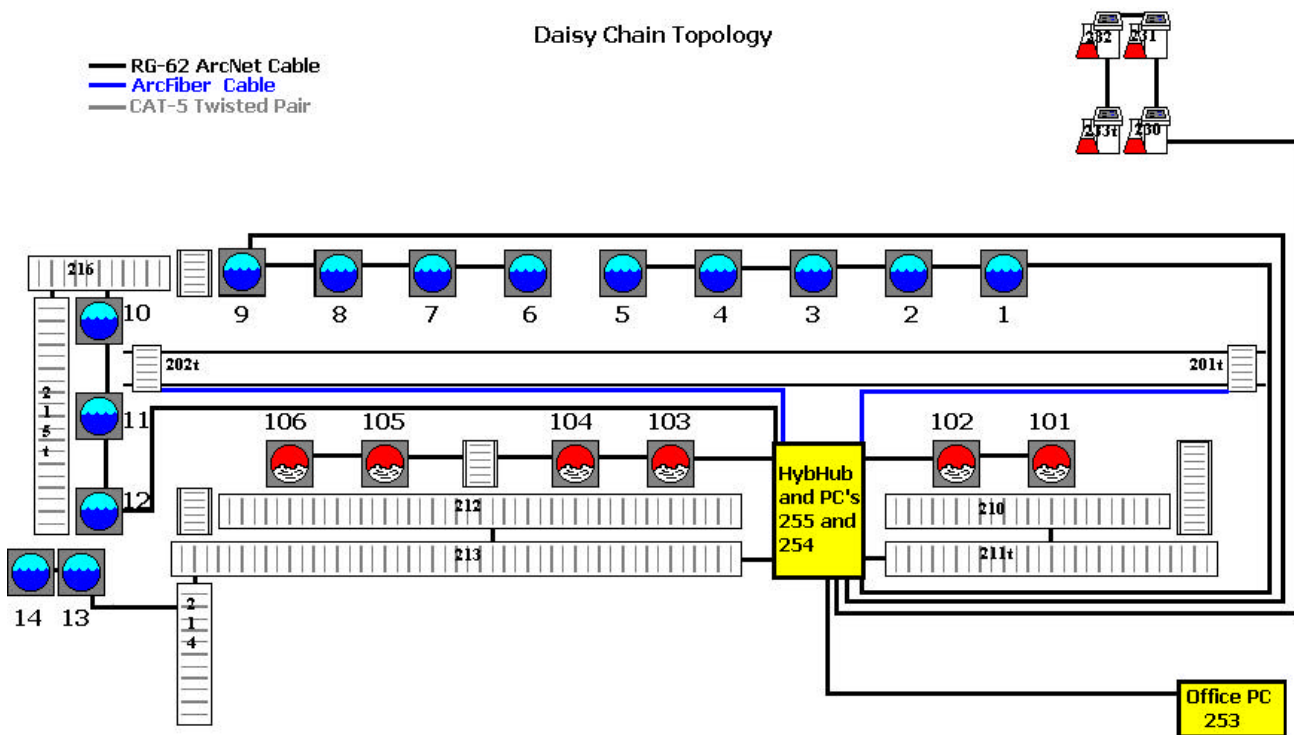
These are a few examples of some watchdogs and how to clear and investigate them.

Communication Problems

There are two types of ArcNet networking that is used on an AutoPulse Automation System. Older systems utilize a Daisy Chain topology meaning the ArcNet starts at the ModHub or HybHub then connects to up to eight machines before terminating. On newer systems, a Star Topology is utilized meaning that an ArcNet cable is connected at the ModHub or HybHub then terminated at a single machine. Below are examples of both topologies.

The Amber “Recon” light is flashing on the ModHub or the LED’s are flashing on my HybHub and none of the automation is working or communication is lost to some machines on a specific ArcNet line. With each Softrol AutoPulse Automation System you will receive a wiring map of how each machine is connected to the network. With the provided ArcNet wiring map, go to the ModHub or HybHub and start disconnecting each ArcNet connection one at a time watching the “Recon” light or LED’s while each line is being removed. If the “Recon” light turns off or the LED’s stop flashing after disconnecting a certain connection, look to see if the rest of the automation is operating properly. If the automation is operating properly, reconnect the troubled ArcNet connection to the ModHub/HybHub and verify that the problem still exists. If the “Recon” light or LED’s starts flashing, disconnect the troubled ArcNet connection and proceed with the following:

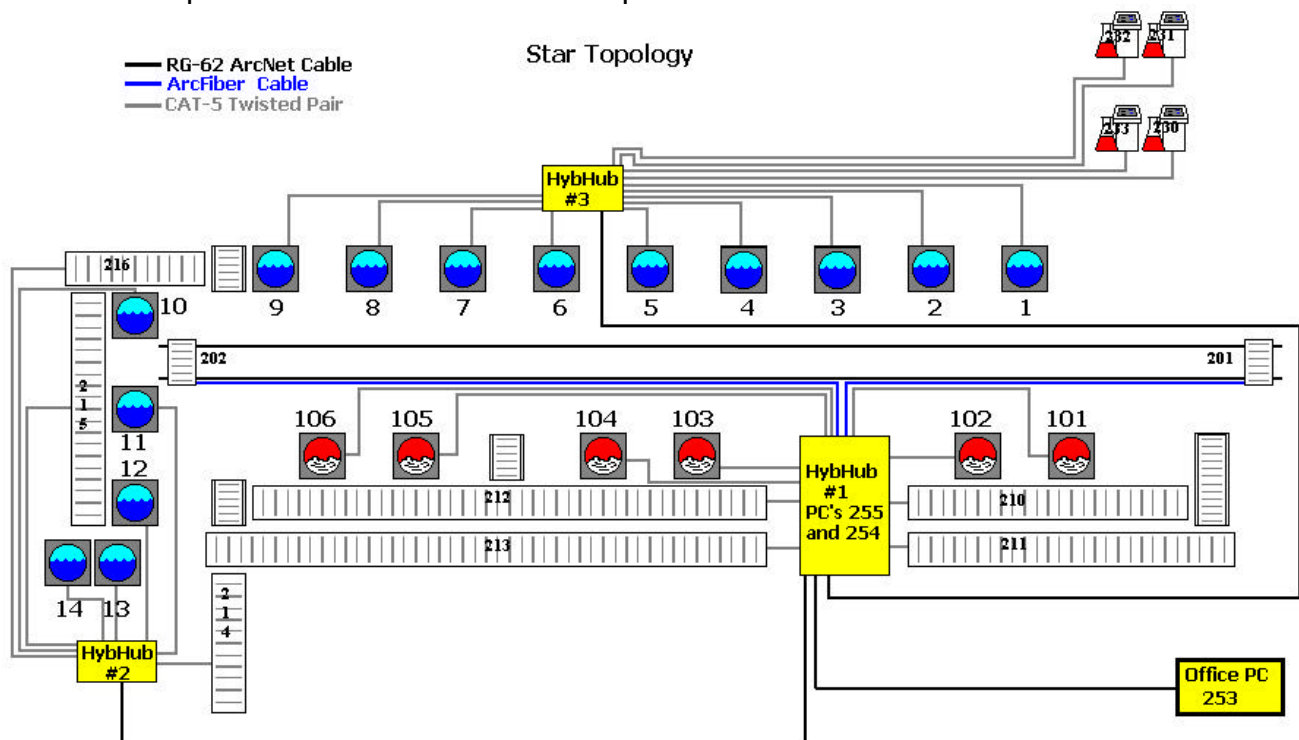
On the provided ArcNet layout map, look to see what machines are connected together in the ArcNet loop. For example: the troubled connection will be labeled “To Machine 1”.



Example

First check the machine setups to make sure that they have not been altered. Make sure each machine ID is correct and please notice the machine 5 is the termination point of the

ArcNet link. The ArcNet is terminated with a 93-ohm terminator. If this terminator has been removed, intermediate communication will occur. Starting with machine 1, disconnect the ArcNet connection. Go to the ModHub or HybHub and reconnect the ArcNet loop labeled "To Machine 1". Check the Recon light. If it starts flashing, disconnect the ArcNet connection from the ModHub or HybHub and proceed to machine 2 and disconnect the ArcNet connection then recheck the hub. Continue to machine 4. If the Recon light is still flashing, remove the 93-ohm terminator from machine 5 and place it in line at machine 4. Reconnect the ArcNet connection to the ModHub or HybHub and check the Recon light. If the flashing stops, reconnect the ArcNet to machine 1-3 and check the Recon light on the ModHub or HybHub. If the Recon light remains silent, you have narrowed the problem down to either the ArcNet cable has been damaged between machines 4 or 5 or machine 5 is having communication problems. It would also be advisable to check the all of the machine setups to insure that there are no duplicated ArcNet Ids.



Example

The problem is my LED's are flashing on the HybHub's. First check the machine setups to make sure that they have not been altered. Make sure each machine ID is correct. Now go to HybHub #1 and disconnect the ArcNet cable labeled "To HybHub #2". Check to see if the LED's are flashing on HybHub #1. If the LED's are solid, go to HybHub #2 and check to see if the LED's are flashing. If the LED's are solid, check the ArcNet cable to HybHub#1. If the LED's are flashing, disconnect all ArcNet cables. Re-connect the ArcNet cables one cable at a time to find the ArcNet line causing the problem.

AutoPulse System Shutdown and Startup

To shut down the System

Shuttle Shutdown

Place the shuttle or shuttles into the desired position. Press the Emergency Stop Button on either side of the shuttle or on the podium.

Washer Shutdown

Go to each washer. Place the washer into manual. Check the status of the machine. Do not attempt to stop a machine in a chemical step, directly after a Bleach step, or during an extract. If the machine status meets the criteria, press the [NO] key, enter a level 8-pause timer password (default is 888888), press the Emergency Stop Button on the front panel.

Dryer Shutdown

Go to each dryer. Place the dryer into manual. Check the status of the dryer i.e. Waiting to Unload, Running a formula, etc.

DO NOT STOP A DRYER DURING A FORMULA.

Place the dryer into the run position. Close all doors. Enter a level 8-pause timer password (default is 888888), press the Emergency Stop Button on the front panel.

Catalyst Shutdown

Go to each Catalyst Chemical Injection System.

DO NOT STOP A CHEMICAL SYSTEM DURING AN INJECTION.

Press the [ENT] + [NO] keys to disable each of the systems. Press the Emergency Stop Button on the front panel. Inspect each station for leaks. Go to each chemical day tank check levels, leaks, and close the line ball valve.

Air and Water Supplies

Go to the maintenance engineer and advise that all wash isle machinery has been shut down meaning no water or air supplies are needed.

System Startup

Check with the maintenance engineer to see if water and air supplies are available.

Catalyst Injection Startup

Check the chemical day tanks for chemical levels. If levels are satisfied, open the line ball valves. Check each Catalyst Injection System for leaks. Press the [ENT] + [YES] keys to enable each system.

Washer Startup

Check machine state. Does control match machine status? If yes, place machine into automatic. If no, synchronize controller. The controller will be in one of three states.

Waiting to load (Machine Empty)

Place the Auto/Manual selector switch into Auto. Pull out the Emergency Stop switch. Press the [CLR] + [ENT] keys to set machine to empty.

Note: if this sequence is performed prematurely while a machine is still loaded, the AutoPulse database will assume the machine is ready to receive a load and can be loaded.

Formula execution

Machine paused; check the cause, pull out the Emergency Stop Switch, and press the [YES] keys to continue the formula.

Waiting to unload

Place the Auto/Manual selector switch into Auto. Pull out the Emergency Stop switch.

Dryer Startup

Waiting to load place the Auto/Manual selector switch into Auto. Pull out the Emergency Stop switch. Press the [CLR] + [ENT] keys to set machine to empty.

Waiting for auto unload place the Auto/Manual selector switch into Auto. Pull out the Emergency Stop switch.

Waiting to unload, place the Auto/Manual selector switch into Auto. Pull out the Emergency Stop switch. Press the [ENT] + [NO] keys. Press the [YES] key; enter the formula number for the Auto Discharge Formula (formula 101).

Unload Conveyors

Check the status of the dryer unloading conveyors. Make sure the conveyor status is correct i.e. waiting to Receive Load or Loaded waiting to Transfer. Clear all conveyors.

Soil Rail System

Place the soil rail system into the Automatic mode.

Shuttle Startup

Check to see if all safeties (i.e. no machine movement interference) are OK. Pull out the Emergency Stop buttons on each shuttle. Press the Start Auto button on a shuttle. Press 4 = Reset and Position. Go to the next shuttle and repeat.

Special Keystrokes for the MicroPulse

System Keystrokes

The AutoPulse automation system is designed to allow a combination of keystrokes that will cause certain functions.

Washers & Dryers

Pressing any one of the numeric keys (0-9) will suspend automatic operation of the machine for 1 min. Pressing the [ENT] + [CLR] keys will set the machine to empty. This should only be used to empty the machine.

Shuttle

Pressing the [ENT] + [CLR] keys while in the automatic mode will bring up the system reset menu. The shuttle can be used in manual, reset, or resumed from this menu.

MicroPulse Password System

The MicroPulse controllers all utilize a six-digit password system. On the washers and dryers there are 7 levels of passwords. Each password level has increasing abilities to manipulate the machine. The following chart shows the level of password and its respective function.

Level	1	2	3	4	5	6	7	8
Cancel Steps	x	x	x	x	x	x	x	
Access Totals		x	x	x	x	x	x	
Manual Operation			x	x	x	x	x	
Maintenance			x	x	x	x	x	
Calibrate			x	x	x	x	x	
Clock			x	x	x	x	x	
Cancel Watchdogs				x	x	x	x	
Setups						x	x	
Program						x	x	
Watchdogs/Setups							x	
Freeze Timers								x

System operation

The wash floor operator uses the level one password. This allows the operator to advance through a formula in the event the machine should be stopped in the middle of the formula. This will not allow the operator to cancel watchdogs. Personnel with a level 4 or higher password must do the canceling of a watchdog. The level 7 password is the highest available. It can be used for all the functions mentioned above as well as for programming and changing the machine setups.

The shuttle control has only one password, a level seven. This password can be used to change the setup of the shuttle as well as calibrate the shuttle and change the clock. This

password must be entered from the system menu on the shuttle. It must not contain the digits 1-4.

The dryer unload belt also utilizes one level seven password. It can be used to change the setups of the control. It must be entered once the setup option is selected from the main menu. If the password is valid, the controller will tell you so.

**Conveyor
Problem**

The conveyor will not reset to empty.

Check

Check the photo eyes at either end of the belt. Their inputs to the controller should be on when the belt is empty. The photo eye may simply need to be aligned. Also check the belt empty input. It should come on when the belt empty button is pressed

Problem

The dryer will not unload onto the belt.

Check

The belt empty input should be on. The photo eye may simply need to be aligned. Check ArcNet communications to insure all machines are communicating.

**Dryer
Problem**

The dryer will not open its front door after unloading.

Check

Check the rear door of the dryer for obstructions. This door should be closed after the dryer has unloaded.

Problem

The dryer has its front door open and is in the load position but it will not accept a load.

Check

Check the dryer to make sure that the Front Door Open and At Load Position inputs are on.

**Shuttle
Problem**

The shuttle loses its position. (The shuttle attempts to load a machine in the wrong position.)

Check

Check the position marker on the shuttle. Check the loading and the unloading setups on the machine to insure integrity.

Problem

The shuttle drops out of automatic and displays "Side Switch Fault"

Check

Check the side bar safeties at the sides of the shuttle.

Problem

The shuttle has a load on it and will not go to an empty dryer.

Check

Check the dry process data for the load on the shuttle. It must have a valid dry class, formula, and weight.

Washer

Problem

The washer needs to be unloaded manually.

Solution

Place the washer and shuttle in manual and use the washer controller and the manual belt switch to unload the washer. To make the shuttle automatically load the dryer, use a reset auto only on the shuttle and enter in the dry process data.

Problem

The washer must be loaded manually.

Solution

Start the formula manually. Then use Plant Monitor Database to read the Item Data Record, edit this record for the correct dry process data and rewrite it to the machine.

Problem

The washer will not unload after it is done.

Check

Check the machine communications and the machine position. Check the unloading setups on the machine to insure integrity.

Machine Node Setups Washer

Machine ID								
Load Postion								
Unload Postion								
Machine Class								
Sequence Priority								
Lo Weight Allowed								
Hi Weight Allowed								
Lo Formula Range 1								
Hi Formula Range 1								
Lo Formula Range 2								
Hi Formula Range 2								
Lo Formula Range 3								
Hi Formula Range 3								
Interfearence Position Lo								
Interfearence Position Hi								
Loading Height								
Loading Depth								
Unloading Height								
Unloading Depth								

Machine Node Setups Dryer

Machine ID								
Load Postion								
Unload Postion								
Machine Class								
Sequence Priority								
Lo Weight Allowed								
Hi Weight Allowed								
Lo Formula Range 1								
Hi Formula Range 1								
Lo Formula Range 2								
Hi Formula Range 2								
Lo Formula Range 3								
Hi Formula Range 3								
Unload Belt Enabled								
Send Data Record								
Idle at Load Position								
Loading Height								
Loading Depth								
Unloading Height								
Unloading Depth								

Conveyor ID							
Belt Type							
TX Load Auto Positive							
TX Load Auto Negative							
P Process Range to RX Lo							
P Process Range to RX Hi							
Unload a Belt							
Connecting Belt #11 ID							
Connecting Belt #12 ID							
Connecting Belt #13 ID							
Connecting Belt #14 ID							
Connecting Dryere ID							
Unload Positive Wash/Dry Position							
Unload Negative Wash/Dry Position							
Unload Positive Belt Position							
Unload Negative Belt Position							
Max. Time Belt Full							
Max. Time Unload Sequence							
Belt Run Time at RX Min. Time							
Belt Run Time at RX Max. Time							
W/D Belt Delay at Receive							
W/D Belt at Receive Jog Off							
W/D Belt at Receive Jog On							
Belts Belt at RX Belt Delay							
Belts Belt at RX Belt Jog Off							
Belts Belt at RX Belt Jog On							
Eye Delay Positive							
Eye Delay Negative							
Belt Run Time at TX Min. Time							
Belt Run Time at TX Max. Time							
Belt at TX Jog Off							
Belt at TX Jog On							
Signal Mute Time							
Hold Load Pos. End							

Conveyor ID							
Hold Load Neg. End							
Hold Load Acc. To P. Proc							
P.Process Numbers Pos. End Low							
P.Process Numbers Pos. End High							
P.Process Numbers Neg. End Low							
P.Process Numbers Neg. End High							
P.Proc Interference							
P.Proc Interference Low							
P.Proc Interference Hi							
Variable Speed Drive							
Flash in Auto							
Extend Retract							
Retract Belt When Empty							
Retract Belt When Loaded							
Retract Belt When Loading							
Unload According to Post Process							
Retract Belt When Unload Pos PP Lo							
Retract Belt When Unload Pos PP Hi							
Extend Belt When Unload Pos PP Lo							
Extend Belt When Unload Pos PP Hi							
Retract Belt When Unload Neg PP Lo							
Retract Belt When Unload Neg PP Hi							
Extend Belt When Unload Neg PP Lo							
Extend Belt When Unload Neg PP Hi							
Retract Belt When Unload Positive							
Retract Belt When Unload Negative							
Formula Range Lo							
Formula Range Hi							
Machine Class Type							
Load Position							
Unload Position							
No Dry Positive							
Seq. Priority							
Database ID							

Weighing Conveyor Setups

Network ID							
Database ID							

MACHINE NET SETUPS							
Shuttle Load Pos#							

CONTROL PARAMETERS							
Metric System							
Reverse 1/2 Pkt @ Ld Time							
Max Fwd/Rev Run Time							
Check Min. Weight							
Shuttle Priority							
Max Time to Load PKT							
Prmpt for Lot#							
Prmpt for Cust#							
Prmpt for Wt							
Prmpt for Count							
Silence Alarm							

MANUFACTURE SETUPS							
TX Load to Shuttle							
Max Pkt WGT Range (+/-)							
Max Pkt Load							
Validate Lot#							
Load Cells							
Variable Speed Drive							

Shuttle ID								
Neg Stop Pos								
Pos Stop Pos								
Home Pos								
Load Pos								
Origin								
No Dry St #1								
No Dry St #1 Pos								
No St #1 Class								
No Dry St #2								
No Dry St #2 Pos								
No St #2 Class								
No Dry St #3								
No Dry St #3 Pos								
No St #3 Class								
No Dry St #4								
No Dry St #4 Pos								
No St #4 Class								
No Dry St #5								
No Dry St #5 Pos								
No St #5 Class								
Priority								
Ld Washer Belt On Time								
Ld Washer Belt Off Time								
Unld Wash Delay @ Unld								
Unld Wash Belt On								
Unld Wash Belt Off								
Unld Wash Belt Full Delay								
Declare Belt Empty								
Ld Dryer Belt On								
Ld Dryer Belt Off								
Prefered Range Lo								
Prefered Range Hi								
Approach Position count								
Two Shuttle Net								
Belt Photoeye delay								
Eye Bock delay								
ArcNet Node ID								
Database Node ID								

SOFTROL

Software & Control for Automation

This has been an overview of the Softrol AutoPulse Automation System. If you have any questions or suggestions, please contact Softrol Systems, Inc.

Softrol AutoPulse Automation System 1st addition 05/26/99

Revised 01/31/01: Created PDF format

Revised 06/28/01: Added K4 control to single pocket loading conveyor

Revised 12/11/01: Revised manual layout

Revised 01/14/02: Revised description of shuttle beds A&B)

Revised 07/05/02: Added information to Interference Pos. Hi setup

Revised 10/23/02: Added mirror Scissor Shuttle explanation

Revised 11/08/02: Clarified description of shuttle beds (A&B)

Revised 02/20/03: Updated Scissor Shuttle unloading options

Revised 04/03/03: Updated machine class type 91 systems

Revised 08/27/03: Updated semi-automatic setups to the conveyor

Revised 09/05/03: Updated semi-automatic sequence for the conveyor

Revised 01/15/04: Added Negative/Positive distinction and updated connecting belt information for clarification

Revised 01/30/04: Corrected setups in conveyor section

Revised 03/11/04: Corrected connecting belt information

Revised 03/19/04: On conveyors, added the additional override display. Added the belt type Unload Washer/Load Dryer. Updated input status

Revised 06/08/04: Revised Unloading Height setups for washers

Revised 11/02/04: Added PALM to the Sling Systems

Revised 11/29/04: Added Star/Daisy Chain ArcNet topologies to Troubleshooting section

Revised 07/26/05: Revised in shuttle section on Reset Auto to Class instead of Group

Revised 12/21/06: Added 1 to 5 pocket weighing conveyor.

Revised 11/26/07: Added declaring conveyor loaded/empty.

Revised 11/24/08: Updated Max Time Belt Full setup as well as the mailing address.

Revised 07/27/09: Updated Unloading Height for washer setups.

Revised 11/17/11: Added additional error messages to shuttles.

No portion of this manual may be duplicated in any manner without expressed written consent of Softrol Systems, Inc.

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