DOMTAR – PORT EDWARDS, WI
P.O. # 1-72-03745

ROLL HANDLING & FINISHING SYSTEM

FUNCTIONAL DESCRIPTION

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Revision Index

No.	Date	By	Checked	Approved	Comments
00	01/15/2003	RFB	Mbi	EBu	Preliminary draft.
01	08/01/2003	RFB	Mbi	EL	Modifications as per client requests & as built.

Note: All changes made as per revision 01 are highlited in yellow.

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4.0 GENERAL

Advanced Dynamics Corp Ltd. proposed the supply of a roll handling system under the project #2459. Domtar purchased the proposed handling system under the purchase order #1-72-03745.

The following document is to be used by Domtar and Advanced Dynamics Corp Ltd. as a guideline in the understanding of the operating philosophy and the related controls scope of work.

Please refer to Advanced Dynamics Corp Ltd. mechanical general layout drawing #**BF00-D1-29293** for general information and all equipment locations.

The controls drawing #**ZA00-B8-29608, sheets 1 through 18** are to be referred to for instrument & panel locations related to the controls of this system. For further information, please consult the appropriate detailed drawing according to the controls drawing list on drawing #**ZA00-B8-29607**.

4.1 VOCABULARY

This section defines words and abbreviations used in the following document.

1. **ADCL:** Advanced Dynamics Corp. Ltd.
2. **ECR:** Electrical control room.
3. **MIS:** Management integration system (Domtar – Port Edwards).
4. **VFD:** Variable frequency drive.
5. **FVR:** Full voltage reversing (motor starter).
6. **FVNR:** Full voltage non-reversing (motor starter).
7. **PLC:** Programmable logic controller.
8. **RVDT:** Rotational variable displacement transducer.
9. **LVDT:** Linear variable differential transducer.
10. **MCR:** Master control relay. This relay enables electrical operation of equipment in dedicated zones. (E-stop)
11. **HPU:** Hydraulic power unit.
12. **LHS:** Left hand side, with respect to roll flow.
13. **RHS:** Right hand side, with respect to roll flow.
14. **FPM:** feet per minute.
15. **AB:** Allen-Bradley.
16. **I/O:** input/output.
17. **DH:** data highway (communication).
18. **RIO:** remote I/O.

4.2 SCOPE OF ELECTRICAL SUPPLY

4.2.1 Provided by ADCL

The supply of electrical components will be according to the following, unless specified otherwise:

- All motors will be type "TEFC" with class "F" insulation. Their voltage will be 460Vac, 3 phase, at 60 Hz, with a 1.15 service factor. They will be inverter duty when controlled by a VFD;
- All control signals for field elements will be 120Vac for discreet signals and 4-20mA for analog signals.

Where applicable, ADCL will pre-wire all control elements (switches, valves...) to terminal strips in junction boxes, in order to meet the requirements described in its proposal.

4.2.1.1 Controls Hardware/Software

The following list enumerates the major control components included in the ADCL scope of supply:

One NEMA 12 control panel (80PLC1), complete with:

- One AB series 5/40 PLC, with DH+ and RIO communication;
- One AB I/O rack complete with RIO communication module;
- AB discreet I/O cards (qty as required);
- AB analog I/O cards (qty as required);
- PLC program for all ADCL supplied equipment based on AB RsLogix 5 platform;
- Power supply and miscellaneous material.

Note: The 80PC1 control panel will be supplied separate but installed coupled to the drive panel 80MCC1, in the ECR which is located in the basement. Its installation is to be done by Domtar and its exact location is to be defined by Domtar.

One NEMA 12 drive panel (80MCC1), complete with:

- AB VFD's, PowerFlex series (qty as required);
- AB dynamic braking kit for VFD (where required);
- All appropriate line filters and reactances;
- Siemens type IEC FVR and/or FVNR motor starters (qty & type as required).

Note: The 80MCC1 drive panel will be supplied separate but installed coupled to the control panel 80PLC1 in the ECR which is located in the basement. Its installation is to be done by Domtar and its exact location is to be defined by Domtar. This panel must be fed from a circuit breaker by Domtar - its consumption is 200A / 460Vac / 3 phases.

One NEMA 12 pushbutton station (80PBS1), complete with:

- Slat chain conveyor fwd/rev selector (section 17);
- Slat chain conveyor load/discharge selector (section 17);
- Ejector raise/lower selector (section 39);
- Lifting scoop raise/lower selector (section 12);
- Cushion raise/lower selector (section 18);
- Manual/auto selector for infeed zone;
- E-stop pushbutton for system.

Note: The 80PBS1 pushbutton station will be installed on a pedestal on the deck floor (slat chain conveyor) level, on the RHS, just before cushion/ejector 23. Its installation is to be done by Domtar and its exact location is to be defined by Domtar.

One NEMA 12 pushbutton station (80PBS2), complete with:

- Backstand selector switch (6 positions);
- Wrapper dispenser fwd/rev selector;
- Manual/auto mode selector for wrapper zone;
- E-stop for system.

Note: The 80PBS2 pushbutton station will be installed on the deck floor level, on the East side of the wrapper dispenser, near the staircase serving the maintenance platform. It is mounted by ADCL in this location.

One pendant type pushbutton station (80PBS3), supplied with hoist system, complete with:

- Selected (via 80PBS2) backstand open/close selector (in manual mode only);
- Hoist fwd/rev selector (2-speed);
- Hoist up/down selector (2-speed);
- E-stop for hoist only.

Note: The 80PBS3 pushbutton station will be mounted off of the hoist itself, following it as it moves in the forward/reverse direction. It is mounted by ADCL in this location.

One NEMA 12 pushbutton station (80PBS4), complete with:

- Wrapper dispenser pinch on/off selector.

Note: The 80PBS4 pushbutton station will be installed on the deck floor level, on the East side of the wrapper dispenser, inside the structure opposite 80PBS2. It is mounted by ADCL in this location.

Other:

- One red pullcord switch for E-stop at the combined wrapping-crimping-heading station;
- One blue pullcord switch c/w for indexing the sequence of operation at the combined wrapping-crimping-heading station;
- One weighing station under belt conveyor #22, complete with four load cells, one summing junction box and one weight display;
- One clamp truck detector consisting of a transmitted beam photocell arrangement, roughly 5 feet in front of the discharge conveyor and 22 inches high, extending from the discharge conveyor frame (the emitter and receiver c/w structure are to be guarded by Domtar);
- Wiring between ADCL supplied electrical components and locally mounted junction boxes, unless specified otherwise in our electrical drawings.

Note:

- The e-stop (red) pullcord will be installed by ADCL around six feet high, over and across the combined wrapping-crimping-heading station;
- The index (blue) pullcord will be installed by ADCL around seven feet high, over and across the combined wrapping-crimping-heading station, with two vertical pullcords dropping roughly three feet down mounted off of it;
- The load cell installation is to be done as per instructions given on the appropriate mechanical drawing. The summing junction box is to be installed on the frame of the belt conveyor by Domtar. The weight display is to be supplied loose by ADCL and installed by Domtar near its barcode scanner & MIS station – its exact location is to be defined by Domtar.

  Important: The roll weight measuring is only to be used by Domtar's MIS system, without any PLC sequence signals.

- The clamp truck detection system is to be wired in the equipment supplied junction box. The mechanical guarding of the photocells and structure is to be done by Domtar.

One NEMA 12 operator interface (80PV1), complete with:

- AB PanelView 1000 (color, touchscreen, DH+ communication);
- Appropriate selectors and pushbuttons for manual and automatic operations of the following equipment (for more details, please see the individual screens detailed in Annex A of this document):

  - Roll cushion / ejector (section 23);
  - Tilting ramp (section 24);
  - Driver roll assembly (section 25);
  - Heading machine (section 26);
  - Crimping machine c/w group tightener (section 27);
  - Wrapper dispenser (section 28):
  - Cutter and hot melt gluer (section 29);
  - Roll upender (section 33);
  - Discharge conveyor (section 34).

- Manual/auto selector for wrapper zone;
- E-stop pushbutton for system;
- MCR (E-stop) reset pushbutton for system.

Note: The 80PV1 operator station will be installed on a pedestal on the wrapper level, on the RHS of the tilting ramp near the belt conveyor. Its installation is to be done by Domtar and its exact location is to be defined by Domtar.

4.2.1.2 Controls documentation

All the control drawings made by ADCL will be in the 11" x 17" format, drawn with AutoCAD version 14 and based on ADCL standards. Microsoft "WORD" and "EXCEL" will also be used for reports, listings and other documents. The following is a list of the control document types to be supplied in this project:

- Functional description;
- Grafcets (logic flow diagrams) of the automatic sequence;
- PLC program in ladder format (on CD format only after start-up);
- PanelView screen configuration & program (on CD format only after start-up);
- Instrument and panel location layout drawings;
- Panel arrangement drawings;
- Interconnection cable/wiring diagram drawings;
- Junction box drawings;
- 120Vac distribution and emergency stop wiring diagrams;
- Input/output schematics;
- Motor control schematics;
- Motor list;
- Pushbutton station layouts and wiring diagrams;

- Pneumatic schematics;
- Hydraulic schematics.

4.2.2 Provided by Others (Domtar)

This section attempts to establish all controls items to be supplied by others.

4.2.2.1 Controls Hardware/Software

The following are the major control components excluded from the ADCL scope of supply and which are to be supplied and installed by Domtar:

One barcode reader station, complete with:

- One mobile "gun type" barcode reader;
- Programming and communication related to integration of barcode reading into system;
- One mounting stand for the barcode reader.

Note: This barcode reader will be mounted on the deck floor level, beside cushion/ejector 23. Its installation is to be done by Domtar and its exact location is to be defined by Domtar.

Important: The roll data scanned by the barcode reader is only to be used by Domtar's MIS system, without any PLC sequence signals.

Pullcord switches (qty to be determined by Domtar) for:

- One pullcord for forward movement of the slat chain conveyor (when pulled);
- One pullcord for reverse movement of the slat chain conveyor (when pulled).

Note: These pullcords will be mounted along the slat conveyor, on the deck floor level. They are to be wired back to the PLC with integration (program modifications) done at start-up. Its installation is to be done by Domtar and its exact location is to be defined by Domtar.

One printer station, complete with:

- One label printer (model and manufacturer to be determined by Domtar);
- Programming and communication related to integration of printer into system;
- One mist system (or equivalent);
- One mounting stand for the printer.

Note: This printer station will be mounted on the wrapper floor level, on the West side of the tilting ramp near the belt conveyor. Its installation is to be done by Domtar and its exact location is to be defined by Domtar.

Important: The printer related data is only to be communicated by Domtar's MIS system, without any PLC sequence signals.

Other:

- All field wiring (cables, trays, conduits, etc) between and/or for: control panels, pushbutton stations, motor starters, VFDs, junction boxes and safety instruments (where applicable).

4.2.2.2 Control Documentation

- Wiring interconnection details for all cables supplied and installed by Domtar between and/or for: control panels, pushbutton stations, motor starters, VFDs, junction boxes and safety instruments (where applicable).

4.3 DESIGN SPECIFICATIONS

Roll or package diameter range	: 24 – 60"
Roll width range	: 16 – 107"
Max qty of rolls within one package	: 5
Package of rolls width range	: 16 – 72"
Roll or package weight range	: 270 – 8 000lbs
Maximum roll ratio	: 4-to-1
Wrapper stock maximum diameter	: 50"
Wrapper stock width range	: 32 – 120"
Length of overhang between end of roll and end of wrapper stock	: 4 – 10" ~ 5" IS NOW MINIMUM
Total wrap length	: 1.25 or 2 * roll circumference - see note 1.
Inside head diameter range	: 23 – 60"
Maximum diameter difference between roll and inner head	: -2 – 0"
Outer head diameter range	: 20 – 56"
Maximum diameter difference between roll and outer head	: -4 – 0"
Number of labels	: 1 or 2 - see note 1.
Roll handling design rate****	: just over 30 rolls*/hour (non grouped***) : just under 30 bundles of rolls**/hour (non grouped***) – see note 2.

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* A roll consists of:	1x single roll, which requires no tightening at combined wrapping-crimping-heading station, nor grouping on upender conveyor.
** A roll bundle consists of:	2x8" wide rolls through 4x18" wide rolls, which are to be tightened at the combined wrapping-crimping-heading station and wrapped as if they were one roll.
*** Grouping consists of:	2 to 5 wrapped rolls, or roll bundles, which are of similar diameter and which are to be upended as if they were one roll – **this exceptional process is not included within the normal time cycle**.

Notes:

1. Time cycle rate based on lower value.
2. Time cycle rate based and dependant on the operator taking the following (maximum) times to accomplish the following tasks:

   - After the roll, or bundle of rolls, is present at the cushion/ejector #23; 2 seconds in order to visually verify the MIS status (ensure the barcode scan functioned properly and the right roll is at the cushion/ejector), visually ensure the roll may be ejected safely and press pushbutton to eject roll towards the combined wrapping-crimping-heading station;
   - After the roll, or bundle of rolls, is wrapped; 6 seconds in order to insert inner heads, break wrapper to hold inner heads and pull on index (blue) pullcord to initiate crimping;
   - After the wrapped roll, or bundle of rolls, is crimped; 7 seconds in order to place outer heads on heading machine platens and pull on index (blue) pullcord to initiate heading;
   - While the crimped roll, or bundle of rolls, is(are) being headed, pick-up of first label for application on top of roll if safe (certain rolls may not be wide enough to do this safely) and pick-up of second label – if not safe; 2 seconds allotted for applying of first label;
   - After the headed roll, or bundle of rolls, is(are) rotated: 3 seconds in order to apply second label and press pushbutton to eject roll towards cushion/ejector #23 via 80PV1 operator interface.

4.4 DEFINITION OF THE OPERATING ZONES

The roll handling system supplied in this project is divided into three separate operating zones: the infeed, the wrapping and the hoist zones. Each are listed such as to relate them to their associated mechanical supply.

4.4.1 The Infeed Zone

The infeed zone consists of:

- Slat chain conveyor (section 17);
- Ejector (section 39);
- Lifting scoop (section 12);
- Cushion (section 18).

The operation of this zone will be described in section 4.5 of this document.

4.4.2 The Wrapping Zone

The wrapping zone is the largest and consists of:

- Belt conveyor (section 21);
- Scale c/w display (section 32);
- Ejector/cushion (section 23);
- Tilting ramp (section 24);
- Driver roll c/w cushion/ejector (section 25);
- Wrapper dispenser (section 28);
- Cutter & hot melt gluer (section 29);
- Crimping machine c/w group tightener (section 27);
- Heading machine (section 26);
- Upender (section 33);
- Backstands #1 through 5 (section 30) - except in manual mode when the open/close movement of the chucks is controlled via the hoist zone.

The operation of this zone will be described in setion 4.5 of this document.

4.4.3 The Hoist Zone

The hoist zone consists of:

- Backstands #1 through 5 (section 30) - except any automatic mode when they are part of the wrapper zone.
- Wrapper hoist (section 31).

The operation of this zone will be described in section 4.5 of this document.

4.5 SYSTEM OVERVIEW

The roll handling and finishing system to be supplied is to handle individual rolls and bundle of rolls within the design limitations described above in point 4.3. Its functions and operations will be broken down according to the three operating zones described earlier.

4.5.1 The Infeed Zone

The infeed zone starts out with a slat chain conveyor upon which an operator is to manually load rolls. This deck floor level is at an elevation of 106'-2 7/8". When loading rolls, the operator must keep a 12" minimum gap between rolls (or bundle of rolls) in order to prevent a problem at the following ejector. (This required gap also applies to roll bundles.) As well, the maximum loading capacity of this conveyor must not be surpassed (48,000#).

Note: The deck floor must be painted with markers at every 12" (by Domtar), so as to assist the operator in creating these adequate gaps.

Additionally, upon creating a roll bundle, the operator must ensure that individual rolls are of the same diameter, positioned tightly together and joined in order to form a **solid** package (that is, with a maximum gap of ½" between rolls).

Note: The solidity of joined rolls is an important issue in order to avoid transfer problems (that is, possible toppling) between the downstream belt conveyors, especially with the narrower and taller rolls.

When loading the conveyor, with pushbutton station 80PBS1 in either manual mode or automatic mode and load state, the operator will be able to use toggle switches supplied and installed by Domtar to move the conveyor forward and reverse. Once the conveyor is full, the operator is to scan each of the roll's tags in order (as per Domtar's procedure) with the Domtar supplied and installed mobile barcode reader. *Note, the roll's barcode information is to be used solely by Domtar's MIS, without any PLC sequence signals.* When ready to discharge the conveyor, the infeed zone must be put into automatic mode and discharge state. When this is done, the conveyor will move forward at a fixed speed of 30FPM and align the first roll (or package of rolls – typical) on a reference passline in front of the ejector. This aligning will be based on a roll length measurement via a photocell located just prior to the ejector and achieved through a PLC timer. The PLC will also perform a verification of roll length and alarm the operator should it exceed a maximum calculated value.

Note: From hereon, "roll" will imply "bundle of rolls" for reasons of simplicity.

The roll will then be ejected via a pneumatic cylinder towards the lifting scoop if it is down, as confirmed by a proximity switch. After a PLC based timer triggered upon the roll traveling into the lifting scoop, via a proximity switch, the lifting scoop will be raised until an intermediate position, also read by a proximity switch. The ejector will be lowered only once this position is achieved such as to ensure the roll cannot roll back out of the scoop.

When the belt conveyor is empty, confirmed by a photocell, and the cushion arm is raised, confirmed by a proximity switch, the lifting scoop will be raised completely in order to deliver the roll to the cushion. After the lifting scoop is raised past its intermediate position, the outgoing roll will activate a proximity switch in the lifting scoop, upon which the cushion will start being lowered after a PLC based timer. The cushioning is completed when the cushion arm is acknowledged in the down position by a proximity switch. This ends the controls associated to the infeed zone and the roll will now sit at an elevation of 110'-2 7/8".

4.5.2 The Wrapping Zone

The wrapping zone thus begins. With the cushion down and only one roll on the belt conveyor, the roll weight is to be registered through a load cell system, upon which the belt conveyor is mounted. *This roll weight and previous barcode information are to be used by Domtar's MIS to generate 1 or 2 labels, via the existing printer station on a first-in / first-out basis (printer station to be relocated by the client if needed), for later application on the wrapped roll. However the roll's weight, along with its barcode information, is to be used solely by Domtar's MIS, without any PLC sequence signals.* Once the roll weight is registered, the roll at the wrapper may be sent back onto the belt conveyor for its delivery. When in place, or when the wrapper is ready for a new roll as determined by the system status, the roll or rolls will be indexed forward – one in front of the wrapper, the other onto the upender.

As the roll is conveyed on the belt conveyor towards the wrapper, it will be measured in length via a combination of photocells and an encoder on the drive assembly. It will subsequently be centered in front of the upcoming pneumatic cushion/ejector #23. Once there, its diameter will be measured through a fixed overhead ultrasonic sensor upon which the whole conveyor is mounted. The diameter and length measurements will be used to pre-position downstream equipment for the incoming roll. At this point, the operator will use Domtar's MIS and existing equipment (to be re-located as required by the client) to confirm that the roll data corresponds to the actual roll present. If not, the roll data in the MIS is to be corrected by the operator via Domtar equipment to reflect the actual roll present.

With confirmation that the cushion/ejector #25 of the combined wrapping-crimping-heading station is raised and the tilting table is level (via proximity switches), the roll can be ejected. This ejection is to be done by the operator via a (physical) pushbutton on the 80PV1 operator interface. Note, prior to ejecting, the operator must ensure a safe environment. If ejecting a bundle of rolls, the operator must also activate the tightening function **prior to ejecting**, by choosing a number greater than 1 on the main screen of the 80PV1 operator interface. (This function is to ensure a tight bundle/package after wrapping.)

As the roll travels in the direction of the combined station, a proximity switch located in the tilting ramp will detect its presence. This will trigger a PLC based timer, after which the tilting ramp will be lifted to give a negative slope to the roll towards the combined station. It will also trigger the lowering of the pneumatic cushion/ejector #25, at the combined station, which will be prepared for reception. When the cushioning is completed, acknowledged by a proximity switch, the tilting ramp will be lowered back to level by deflating the airbags that raised it initially.

If the operator activated the tightening function prior to ejecting a bundle of rolls to be wrapped, the tightener (within the crimping machine) will be engaged so as to squeeze the individual rolls together while rotating them via the drive rollers. After over one revolution, the rolls will be tightened and the wrapping sequence will be initiated. Once the wrapper is on the roll and past the nip point between the roll and driver roll, the tightening will be withdrawn.

Note: When tightening a bundle of rolls, the time cycle may increase beyond two minutes.

Prior to starting of the wrapping sequence, pre-positioning of equipment will have been done according to the incoming roll's diameter and length measurements. (This, in order to cut down on the time cycle of the wrapping operation.) This will include:

- Opening of the crimping paddle wheels and heading platens to roughly the roll length +3 and +36" respectively;
- Height adjustment of the crimping platens to roughly the roll diameter +12";
- Selection of the appropriate wrapper stock (5 choices, according to client loading of the backstands);
- Glueing and positioning of the leading edge of the selected wrapper.

Therefore, the wrapping sequence will start off with the simultaneous advance of the appropriate wrapper and turning of the roll. Individual VFD's will control the drive assemblies of the wrapper dispenser and the roll turning drive rollers. Each wrapper stock is to be dispensed by its own drive, coupled to its respective pinch roll. When engaged via a pneumatic cylinder, this pinch roll squeezes the wrapper against its associated dispenser driver roll, ensuring adequate traction to advance the wrapper. When a dispenser is non-driven, the pinch roll does not squeeze the wrapper but holds it in place by its weight only. The pinch roll can be disengaged, via its pneumatic cylinders, in order to facilitate the feed of a new sheet of wrapper (or the clearing up of a paper jam).

The area holding the wrapper stock for the system, complete with a monorail hoist, is referred to as the backstands. This area comprises of five complete backstands, each able to hold one roll of wrapper, and an empty space for a possible addition of a sixth in the future. The wrapper stock is to be organized by the client such as to have the shortest/lightest roll nearest the wrapper dispenser, increasing to the widest/heaviest furthest from it. Note, at all times, the wrapper stock loading should cover the width of rolls in production, such as to have a 4 - 10" overhang on both sides before crimping. Please see the Hoist Zone for more information regarding loading of the backstands.

In normal operation, the backstands will be in automatic mode and will only require operator intervention to load new wrapper stock. In order to load a new roll of wrapper, please refer to the following section regarding the Hoist Zone.

Returning to the wrapping sequence, which will start off immediately following the completion of the roll cushioning in the combined wrapping-crimping-heading station, the turning drive rollers and wrapper dispenser will stop at a point in time, as determined through PLC controls and based on the roll diameter. This will be done to cut and glue the trailing edge of the wrapper, such as to give a total wrap of roughly 1.25 or 2 times the roll circumference, depending on operator input via 80PV1. Only the drive rollers will re-start to finish the wrap.

After completing the wrapping of the roll, the operator is to insert the inner heads and break the corner of the wrapper in order to hold them in place. After doing so and ensuring a safe environment, the operator is to index the process via the blue indexing pullcord switch. This will begin the crimping sequence and allow the PLC to extend and engage the pneumatically operated inner head holders (which are integrated into the heading machine), then rotate, lower and squeeze both of the crimper's paddle wheels onto the top of the wrapped roll while turning the drive rollers. The crimper's paddle wheel rotation will be achieved through independent electric drives and motor starters, while independent pneumatic cylinders will take care of the lowering and squeeze. The crimping process will take over one revolution of the roll. When completed, the crimping machine will automatically stop the paddle wheel rotation, open and raise its crimping arms c/w paddle wheels in order to return them to their home position (fully open and fully raised). These positions will be confirmed by LVDT's for the opening and raising of the crimping arms (2 total) and proximity switches for the raising of the paddle wheels (2 total).

After crimping and removal of the inner head holders, the operator is to place both outer heads on the heated heading platens. These platens will have a vacuum face that will keep the outer heads in place. Once done and ensuring a safe environment, the operator is to index the process using the blue index pullcord switch. This will begin the heading sequence and allow the PLC to close the heading platens. Each platen will close independently via its own hydraulic cylinder. First at fast speed followed by slow speed upon reaching a short distance from the roll, as determined via an LVDT. Upon contacting the roll, each platen will be pivoted vertically through it being pushed against the roll. When pivoted, as noted via the loss of a proximity switch, the first platen's hydraulic cylinder will be stopped in position until the second platen has also lost its original position. At this point, both platens will be moved in slowly such as to squeeze the roll and apply adequate pressure to glue the outer heads onto the roll wrap.

While the heading is to occur, if safe – else afterwards - the operator is to pick-up the first label (that was printed via the existing client equipment after obtaining the

roll weight on the belt conveyor), humidify it and place it on the top of the wrapped roll. Once this is done, the operator is to pick-up the second label (if applicable, according to the operator input via 80PV1) and prepare it such as to be able to place it on the roll after it has been rotated. This rotation will happen automatically after both platens of the heading machine are opened for a minimum distance. A PLC based timer will control this distance. However, the platens will continue opening until they have reached their home position (fully open), determined by their respective LVDT value.

Once the labels are applied, the operator is to return to the operator interface 80PV1 in order to eject the wrapped roll back towards the belt conveyor, ensuring a safe environment. The roll ejection will only occur if:

1. The tilting ramp is level, as sensed by proximity switches;
2. The belt conveyor is empty at cushion/ejector #23, confirmed by the ultrasonic sensor;
3. The cushion of belt conveyor is raised; as determined by its RVDT value.

Note: **Prior to ejecting the wrapped roll**, the operator will have to confirm via the 80PV1 operator interface if this roll is to be grouped with another. If so, the operator must enter the number of packages that are to be grouped on the upender. Furthermore, when grouping, the operator must ensure that the total weight of the grouped packages does not exceed the maximum capacity of the upender, 8000lbs, nor that the total length of the grouped rolls exceeds the length of the upender's belt conveyor. In the both cases, this may inhibit system operation and/or cause equipment damage.

As the roll travels in the direction of the belt conveyor from the combined/wrapper station, a proximity switch located in the tilting ramp will detect its presence. This will trigger a PLC based timer, after which the tilting ramp will be lifted to give a positive slope to the roll towards the conveyor. Also, with confirmation of the cushion/ejector #25 of the combined station being raised (via a proximity switch), the cushion/ejector #23 at the belt conveyor will be prepared for reception. After cushioning, the incoming roll will have been lowered down into the "Vee" of the belt conveyor. When the cushioning is completed, acknowledged by a proximity switch confirming the down position of the cushion arm, the tilting ramp will be lowered back to level by deflating the airbags that raised it initially. If the upender is ready for a new roll, as determined by its position and the number of rolls upon it, the roll will be conveyed forward from the belt conveyor #21 to the upender's belt conveyor. Like the belt conveyor, the upender's belt conveyor will be controlled by a VFD.

In the case of **non-grouped** rolls (normal situation: when no "grouping" is required via selection by the operator), the wrapped roll will continue to be conveyed onto

the upender's belt conveyor such that its leading edge stops upon reaching the 90 degree outfeed conveyor, as triggered by a photocell located near the 90 degree conveyor.

In the case of **grouped** rolls (special situation: when "grouping" is previously selected by the operator), the first wrapped roll will be stopped and placed in front of the photocell at the entrance of the upender's belt conveyor. It will then wait for the next wrapped roll to come from belt conveyor #21. When it triggers the photocell at the end of belt conveyor #21, both conveyors will be run forward and timed in such a way via the PLC to group the two rolls. Afterwards, the grouped rolls will act as one "non-grouped" roll and will continue to either group with other rolls, or be conveyed forward on the upender's belt conveyor such that it stops upon reaching the 90 degree outfeed conveyor, depending on the quantity of packages to be grouped as per the operator input on 80PV1.

Note: When grouping, the time cycle may increase beyond two minutes.

With a roll (or grouped rolls – typical) on the upender's belt conveyor and the photocell at its entrance being clear, the upender will automatically raise. Raising and lowering of it will be done using a hydraulic actuator. Once the roll is upended onto the 90 degree outfeed belt conveyor and the upender stands vertical, as confirmed by a proximity switch, the 90 degree outfeed belt conveyor will be moved away. This hydraulically controlled action is done to move the roll away from the vertical section of the upender and position it such that, once transferred to the discharge conveyor, it will be within reach of the clamp truck.

When in position, the upender's outfeed conveyor will start conveying the roll towards the discharge conveyor. This outfeed conveyor will be controlled by a full voltage reversing motor starter and run at 30FPM. When the roll is discharged from the upender's outfeed conveyor, the conveyor will be stopped and the upender will be lowered back into position to receive a new roll.

The wrapper zone continues with the discharge area where the clamp truck operator unloads packages from the discharge conveyor. The packages will sit vertically on this conveyor which is at an elevation of 36".

The discharge conveyor will start moving forward when the roll on the upender's outfeed conveyor arrives at its exit position, confirmed by a photocell. The discharge conveyor will stop running forward when a PLC based timer elapses after the roll has cleared the above photocell, while the upender outfeed belt conveyor will stop upon loss of the photocell. Should a roll activate the end photocell on the discharge conveyor (indicating that the discharge conveyor is full), prior to the loss of the photocell by the roll at the exit of the upender outfeed conveyor, both the discharge and upender outfeed conveyors will be stopped. However, should the

roll at the exit of the upender outfeed conveyor clear the photocell when the end switch of the discharge conveyor is triggered, the upender will continue its normal operation.

With rolls transferred from the upender to the discharge conveyor, the operator is to move a clamp truck into position in order to remove rolls. The clamp truck is to be positioned such as to center the selected roll on the discharge conveyor within the truck's clamps (without hitting the truck guard hard and/or unnecessarily). By moving the clamp truck to the discharge conveyor's unloading area, the PLC will stop any movement of the conveyor, via a signal from the clamp truck detection beam (through beam type photocell arrangement), to allow the roll's removal. The system will continue running normally once the truck has cleared the unloading area. Note, if a roll is present at the end of the discharge conveyor, it must be removed in order for a transfer to occur or be completed from the upender's outfeed conveyor. In general, the operator is to remove rolls from the end of the conveyor first, and at an appropriate rate such as to prevent the system to run without delay. Otherwise, the system time cycle will be increased.

Upon removing the roll from the conveyor with a clamp truck, it is important that the operator lift it first, then back-up to remove it from the conveyor – this, in order to avoid damage to the chain assembly of the discharge conveyor and pre-mature failure. Also, care must be taken when clamping, removing and handling packages to avoid any toppling as packages may be stacked one on top of another (depending on operator input at the wrapper).

4.5.3 The Hoist Zone

The hoist zone is always in manual mode. The hoist itself may be operated manually at any time. However, to load or discharge any wrapper stock, the wrapper system must also be in manual mode. In normal operation, the wrapper zone c/w the backstands will be in automatic mode and will only require operator intervention to load new wrapper stock (or clear up a paper jam). In order to load a new roll of wrapper, the operator must first put the wrapper zone into manual mode via pushbutton station 80PBS2 or 80PV1. This will immediately stop any operation within the wrapper zone except roll cushioning, which if started will be allowed to finish for safety reasons. Once in manual mode, the operator is to select which backstand (1-nearest through 5-furthest) requires intervention via pushbutton station, 80PBS2. This selection is to be visually confirmed via a green light over the desired station. If correct, the operator is to manually:

1. Unroll some wrapper such as to create enough slack to re-splice it later (note: in manual mode, the pneumatically operated braking force of the selected station will be automatically reduced in order to allow manual unrolling of the wrapper);
2. Cut the wrapper manually;
3. Position the hoist overhead;
4. Fasten sling securely around hoist hook and wrapper core, leaving a slight slack in it;
5. Unlock wrapper core from stub shafts of the end chucks by slightly rolling core to wrap paper onto it;
6. Open end platens c/w stub shafts via pushbutton on hoist pendant, 80PBS3 (pneumatic motors c/w pneumatic disk brake control each platen's in & out movement);
7. Remove the core and discard of it appropriately, according to mill procedures;
8. Load new wrapper (of same width as previous) c/w core onto hoist;
9. Position new wrapper in the proper backstand using hoist;
10. Close end platens, via 80PBS3, and guide core adequately to have shaft stubs insert into core properly & solidly – ensure visually;
11. Detach hoist from new wrapper & return it to its parking area;
12. Unroll new wrapper and splice it with remaining one;
13. Ensure backstand area is returned into automatic mode, on 80PBS2;
14. Remove the wrap on the roll at the wrapper station if incomplete;
15. Reset wrap, via the PanelView on operator interface 80PV1, to re-start the automatic wrapping process (if need be);
16. Put wrapper zone back into automatic mode once wrap sequence is complete in order to eject roll out of wrapper station (if applicable), or to proceed with automatic running of equipment if roll is elsewhere.

4.6 SAFETY & EMERGENCY STOP PROCEDURES

Six emergency stop devices are to be located within this system. These will be distributed as such:

1. One E-stop mushroom type pushbutton for the system, located in the infeed zone, on 80PBS1;
2. One E-stop mushroom type pushbutton for the system, located in the wrapper zone, on 80PV1;
3. One E-stop red pullcord switch for the system, located in the wrapper zone, going across the top/front of the combined wrapping-crimping-heading station;
4. One E-stop mushroom type pushbutton for the system, located at the border of the wrapper and hoist zones, on 80PBS2;
5. Two E-stop limit switches for the system, which are activated via plates on the front part of the East and West heated platens of the heading machine, in the wrapper zone. ***Note that this e-stop is exceptional in that it will force the opening of the East & West platens of the heading machine for a given time before de-energizing the hydraulic power unit and the solenoid valves which govern the platen outward movement.***

These emergency stops are to be activated in emergencies only and not designed for any maintenance and/or production interventions. Activation of any of these will drop the system's MCR relay and alarm the operator, via the 80PV1 operator interface, that an emergency stop has been made.

All of the system's motor starters and/or VFD control power (120Vac) will be hardwired through a normally open contact of the MCR relay. Thus, dropping of the MCR relay will disable all motors. ***Note that exceptionally, as per point 5 above, specific outputs will be energized for a given period of time should one of the e-stop on the heading platens be activated.***

Any motion controlling PLC output module, except one for point 5 above, will see its 120Vac power turned off in case of an emergency stop. To achieve this, the 120Vac power to each individual PLC output module, except one for point 5 above, will be fed through a normally open contact of the appropriate MCR relay. Therefore, dropping an MCR relay will turn power off to all hydraulic and pneumatic solenoid valves in the system, except as per point 5 above. Note however that 4-20mA inputs/outputs in this system will not be de-energized upon an emergency stop.

To re-arm the system's MCR relay, all emergency stop pushbuttons will have to be pulled out and the power reset pushbutton must be made. On this system, there will be one power reset pushbutton, located in the wrapper zone on the 80PV1 operator interface.

To prevent any injuries, ADCL strongly recommends that a complete lockout procedure of this system be followed before accessing any part of this equipment for maintenance or other reasons, beyond those for normal production operations.

4.7 MECHANICAL EQUIPMENT RELATED

The system supplied will be divided into various mechanical sections, each having their own related control elements and/or features. Please refer to section 3.0 of this manual for detailed mechanical descriptions of the supplied equipment.

ROLL HANDLING & FINISHING SYSTEM

FUNCTIONAL DESCRIPTION

ANNEX A: OPERATOR INTERFACE GUIDE

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Revision Index

No.	Date	By	Checked	Approved	Comments
00	08/01/2003	RFB	MBi	RH	As built.

Note: All changes made as per revision 01 are highlighted in yellow.

TABLE OF CONTENTS

1.0 GENERAL

The following document describes all operator interfaces such as to familiarize the client with the system's operating environment. It also assists in understanding how the system is to run.

The controls general layout drawing #**ZA00-B8-29608, sheet 1** is to be referred to throughout this document for a better understanding of where these operator interfaces are located and how they integrate into the controls system.

IMPORTANT: The operator is responsible for his/her safety, as well as that of others around the equipment when operating in both manual and automatic mode. He/she must ensure a safe operating environment in all cases and at all times.

1.1 VOCABULARY

This section defines words and abbreviations used in the following document:

MCR = master control relay;
HPU = hydraulic power unit.

1.2 OPERATOR INTERFACE DESCRIPTIONS

This section describes in detail each of the operator interfaces that are supplied with the system.

1.2.1 80PBS1 – INFEED PUSHBUTTON STATION

The infeed pushbutton station 80PBS1 is mounted on a pedestal to be located and installed by Domtar in front of cushion/ejector #23, on the deck floor level. Please refer to drawing #ZA00-B8-29613, sheet 1 for its layout. This pushbutton station controls the operation of the infeed zone of the system, with its e-stop acting on the system completely except for the hoist controls. Firstly, it allows the operator to:

- Select the mode of operation of the infeed zone: automatic or manual;
- Stop the infeed and wrapper zones of the system in an emergency, through its e-stop.

In "normal" operation, all e-stops must be disengaged (with reset "on at 80PV1) and the infeed zone must be in auto mode. When these conditions occur, the operator may:

- Select the state of the infeed zone: load or discharge.

To load rolls onto the slat chain conveyor, the operator is to select load state. This permits the running of the slat chain conveyor via either the client supplied and installed pullcords, over the slat chain conveyor, or the selector on the pushbutton station itself. Thus during loading, the operator is to move the conveyor to place rolls on it (respecting a minimum gap of 12" between individual rolls or group or rolls), as well as to place rolls together in a group (note, grouped rolls must be a maximum of ½" apart).

Once loaded (the total loading must not surpass the conveyor capacity of 48,000#), **the operator is to put the infeed zone into discharge state.** At this point, the system will move rolls automatically towards the ejector and up into the wrapper zone.

Should a problem be detected with respect to the roll at the ejector area, for any reason (such as the minimum gap or maximum overall length were not respected), the infeed zone will be stopped and a message will appear on the panel view of operator interface 80PV1.

In manual mode, the operator may:

- Run the slat chain conveyor fwd/rev (section 17);
- Raise/lower the ejector (section 39);
- Raise/lower the lifting scoop (section 12);
- Raise/lower the cushion (section 18).

The above actions may be performed via operator interface 80PBS1 when it is in manual mode, or via 80PV1 when it is in manual mode and 80PBS1 is in automatic mode and discharge state. Note, if 80PBS1 is in manual mode or load state, it has priority over all manual operations of the infeed zone.

1.2.2 80PBS2 – WRAPPER PUSHBUTTON STATION

The wrapper pushbutton station 80PBS2 is mounted on a plate off of the outside North/East corner of the wrapper dispenser frame, on the deck floor level. Please refer to drawing #ZA00-B8-29613, sheet 2 for its layout. This pushbutton station controls the wrap stock selection and feed when the wrapper zone of the system is in manual mode, with its e-stop acting on the system completely except for the hoist controls. Firstly, it allows the operator to:

- Select the mode of operation of the wrapper zone: automatic or manual;
- Stop the infeed and wrapper zones of the system in an emergency, through its e-stop.

In "normal" operation, all e-stops must be disengaged (with reset "on" at 80PV1) and the wrapper zone must be in auto mode (on 80PV1 and 80PBS2). When these conditions occur, this pushbutton station will not be operational.

In manual mode (with no "semi-automatic" sequences performed via 80PV1 in the wrapper zone), **the operator may:**

- Select the wrap stock/backstand - *note, the green light above the selected backstand/wrapper will illuminate and its chuck brake pressure will be minimized when in manual mode* (sections 28, 30 & 31)
- Run the selected wrap stock feed fwd/rev (section 28);
- Block functioning of the wrapper dispenser drives for safe entry into backstands for loading or unloading of wrapper stock (section 28 & 30).

The following procedure is recommended when ***changing a wrapper stock*** in any backstand:

1. Put wrapper zone in manual mode via **both** 80PV1 and 80PBS2;
2. Engage "dispenser drive block" pushbutton on 80PBS2 and **lock-out**;
3. Select appropriate backstand via 80PBS2;
4. Manually unravel roughly 6 feet of selected wrap, cut and flip extra over next backstand frame;
5. Position hoist using 80PBS3;
6. Manually sling wrapper roll securely to hoist;
7. Raise hoist to barely take-up weight of wrapper roll and ensure **all is safe**;
8. Open backstand chucks via 80PBS3;
9. Remove wrapper roll & place where appropriate;
10. Manually sling new wrapper roll securely to hoist;
11. Raise hoist to barely take-up weight of wrapper roll and ensure **all is safe**;
12. Move new wrapper in position using hoist such that center of core is at same level as center of chuck of the selected backstand;

13. Close chucks using 80PBS3 (it may be necessary to lift or lower wrapper roll slightly for better alignment and to allow chucks to fully engage into core);
14. Ensure chucks are **fully engaged**, then lower hoist;
15. Lower hoist to free-up slings and **ensure all is safe**;
16. Remove slings;
17. Move hoist out of way;
18. Splice old wrapper with new wrapper using tape;
19. Unlock and disengage the "dispenser drive block" pushbutton and put the wrapper zone in automatic zone via 80PBS2;
20. **Ensure operator platform is clear of rolls and personnel** and run the selected wrapper dispenser drive forward via the manual screen of 80PV1 until its splice is completely through, that is past the cutter/gluer (while doing this, ensure an operator rolls-up the wrapper on the tilting ramp as it feeds out);
21. Ensure new wrap is fed out straight, if not disengage the appropriate pinch roll via 80PV1 and have other operator manually center wrap lying on tilting ramp;
22. Run the "cut wrapper" semi-automatic sequence via the main screen of 80PV1;
23. Remove the old wrap complete with splice;
24. Resume production.

The following procedure is recommended for ***installing and/or threading a new wrapper:***

1. Put wrapper zone in manual mode via **both** 80PV1 and 80PBS2;
2. Engage "dispenser drive block" pushbutton on 80PBS2 and **lock-out**;
3. Select appropriate backstand via 80PBS2;
4. Remove old wrapper roll if required (see above for recommended steps);
5. Install new wrapper (see above for recommended steps);
6. Manually unravel wrapper and feed through appropriate route to its associated wrapper dispenser (according to drawing #);
7. Unlock and disengage the "dispenser drive block" pushbutton via 80PBS2;
8. Disengage appropriate dispenser pinch roll via 80PBS4 and **have second operator maintain a safe working environment** – he/she must stay at this pushbutton station to operate it and ensure nobody else operates 80PBS2;
9. Have one operator manually thread new wrap through its approriate drive pinch point, pushing the wrap down the stainless steel guides as far as possible, **without ever putting fingers, hand, other body parts or clothing between rollers.** When doing this, **the second operator must keep visual contact with first operator (as possible) and ensure all is safe before engaging pinch roll**;
10. Once the wrapper is fully engaged, both operators are to move out of the equipment and run the selected wrapper dispenser drive forward via 80PBS2;
11. Correct any problem or jam as required, **being safe all the time;**
12. Once the wrapper out past the cutter/gluer; stop feeding and put the wrapper zone in automatic zone via 80PBS2;
13. Run the selected wrapper dispenser drive forward until the wrap is out onto the tilting ramp via the manual screen of 80PV1;

14. Ensure new wrap is fed out straight, if not disengage the appropriate pinch roll via 80PV1 and have other operator manually center wrap lying on tilting ramp;
15. Run the "cut wrapper" semi-automatic sequence via the main screen of 80PV1;
16. Remove the old wrap;
17. Resume production.

1.2.3 80PBS3 – WRAPPER HOIST PENDANT

The hoist pendant identified as 80PBS3 is supplied with the purchased wrapper stock hoist system and customized in order to integrate the controls for opening and closing of the selected backstand (selection made via 80PBS2). This pendant is mounted on a flexible cable back up to the hoist itself via a small festoon. Please refer to drawing #ZA00-B8-29608, sheet 18 for its layout. This pushbutton station allows the operator to:

- Stop the hoist system (only) in an emergency, through its e-stop (see note below);
- Run the hoist up/down in either of 2-speed modes (section 31);
- Run the hoist trolley fwd/rev in either of 2-speed modes (section 31);
- Sound the hoist horn (section 31);
- Move the selected (selection made via 80PBS2) backstand's chucks open/close (section 30).

Note: Any movement will cease, except should a failure occur, when its associated pushbutton on 80PBS3 is released.

The wrapper hoist system may only be operated in a manual fashion. In order to operate the backstand chucks via the wrapper hoist pendant, 80PBS3, the wrapper zone must be in manual mode (via 80PV1 or 80PBS2), all e-stops must be disengaged and the reset "on" at 80PV1.

The above actions may not be performed via any other operator interface.

IMPORTANT: No personnel is to change a backstand with the wrapper zone in automatic mode, nor without engaging and locking-out the "dispenser drive block" pushbutton on 80PBS2.

Please refer to the above section 1.2.2 regarding **recommended procedures** for changing a wrapper stock and installing and/or threading a new wrapper.

1.2.4 80PBS4 – DISPENSER PINCH PUSHBUTTON STATION

The wrapper dispenser pinch pushbutton station 80PBS4 is mounted on a plate off of the inside North/East corner of the dispenser frame, on the deck floor level. Please refer to drawing #ZA00-B8-29613, sheet 4 for its layout. This pushbutton station controls the pinch of the wrap stock on the selected driver roll when the wrapper zone of the system is in manual mode. It allows the operator to:

- Engage/disengage the pinch roll from the wrapper feed drive roll.

This pushbutton station is only operational when the wrapper zone is in manual mode (via 80PV1 or 80PBS2), all e-stops are disengaged and the reset is "on" at 80PV1. It is only to be used when manually threading wrap stock from a backstand through its appropriate drive.

IMPORTANT: No personnel is to go into the wrapper dispenser without the wrapper zone being locked and tagged-out or, if in manual mode, having a second person supervising on the outside as well as following a tag-out procedure to ensure a safe environment is preserved.

The above action may be performed via operator interface 80PV1 when in manual mode, ***however this station must not be used instead of 80PBS4 during the threading operation as it is less safe*** *(distance & visual problem between person in dispenser & operator at 80PV1).*

The above action may be commanded via 80PV1 to correct alignment of a selected wrapper. This is achieved by feeding it out onto the tilting ramp and having one operator manually pull the wrapper to center it while another disengages the appropriate pinch roll.

Note, when the pinch rolls are neither engaged or disengaged, these still lightly pinch the wrap through their weight to avoid it slipping out of the drive.

1.2.5 80PV1 – MAIN OPERATOR INTERFACE

The main operator interface 80PV1 is mounted on a pedestal to be located and installed by Domtar in front of the belt conveyor, off of and on the West side of the tilting ramp, on the wrapper platform level. Please refer to drawing #ZA00-B8-29613, sheet 3 for its layout. This operator interface controls all of the system's functions, except where specified above. It consists of physical pushbuttons and a selector, as well as an Allen-Bradley PanelView with a touchscreen.

Firstly, this station allows the operator to:

- Select the mode of operation of the wrapper zone: automatic or manual;
- Stop the infeed and wrapper zones of the system in an emergency, through its e-stop;
- Reset the system (MCR) after an e-stop is cleared **(note, after an e-stop, a safe operating environment must be ensured by the operator prior to any reset of the system).**

In "normal" operation, all e-stops must be disengaged and the reset "on" (green light illuminated) at 80PV1 and the wrapper zone must be in auto mode. Should these conditions occur, the operator may use a physical button to:

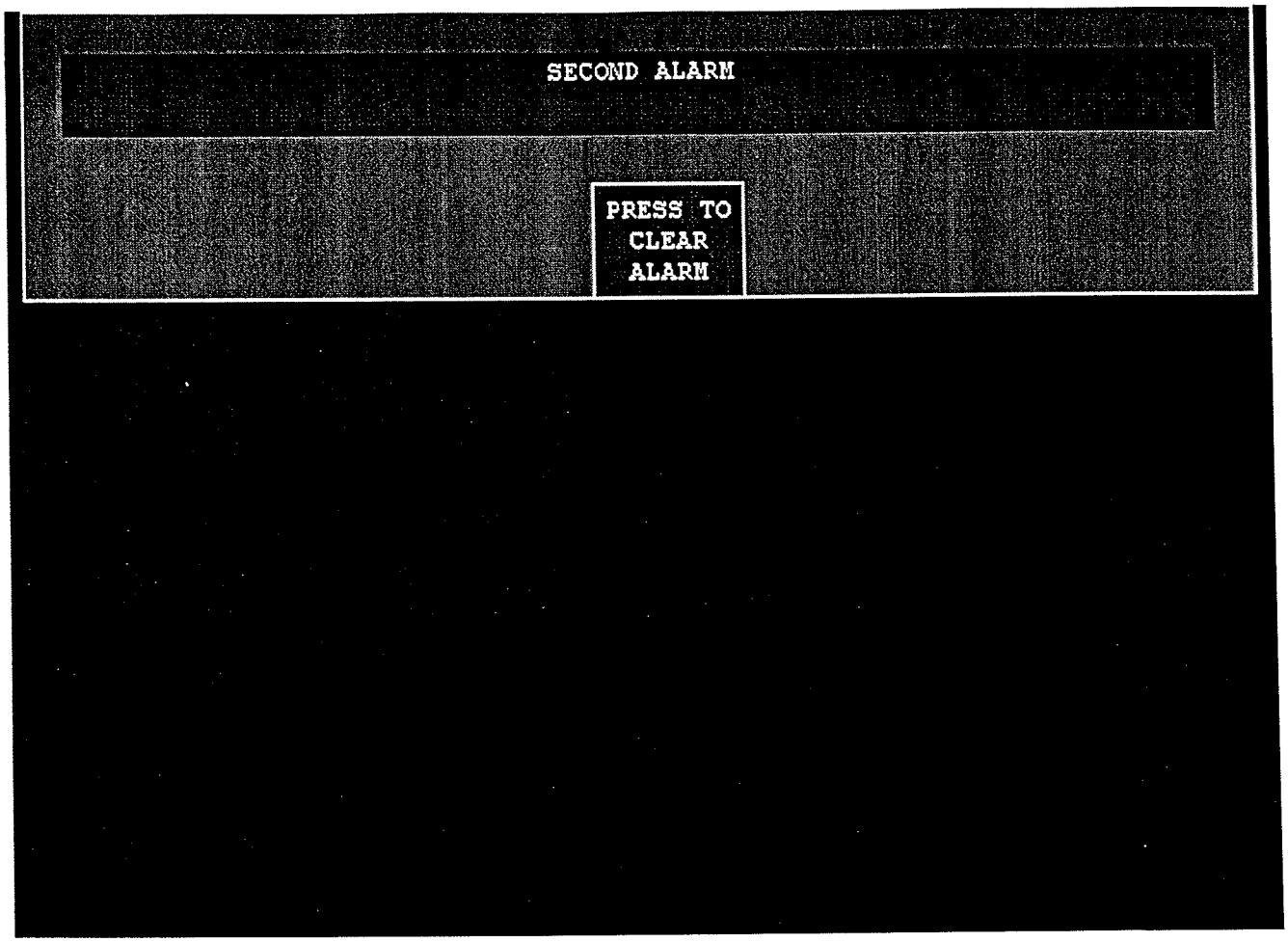
- Eject a roll from either the driver rolls (section 25) at the wrapper station or the cushion/ejector (section 23). The system's PLC program governs which is to be activated.

Other commands are all done via the PanelView. In general, each of the PanelView screens have a layout with the following attributes:

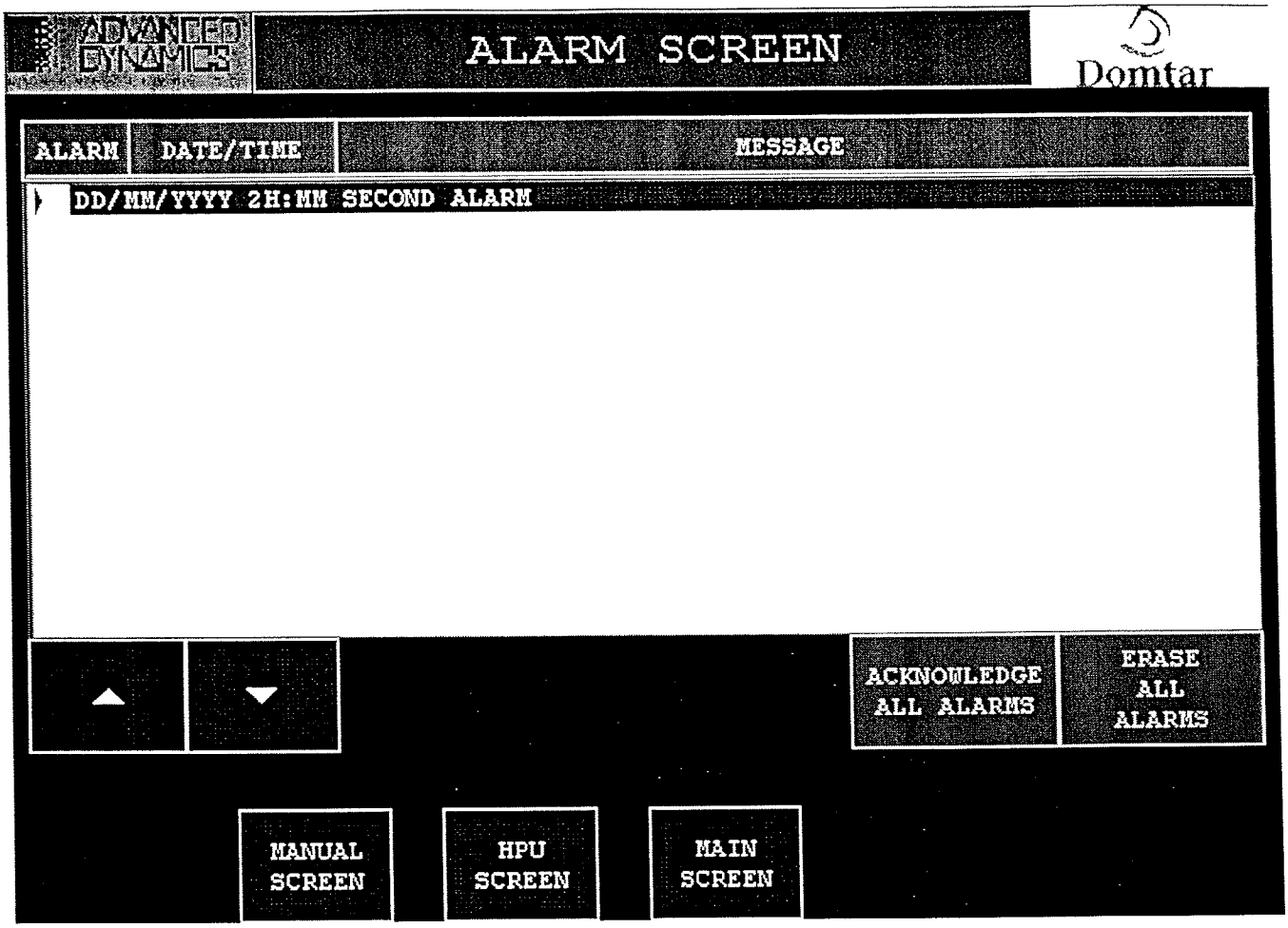
- Screen title in top middle section;
- Client logo in top right hand corner;
- ADCL logo in top left corner;
- Message line just below logos and sceen title (to give information to operator);
- Shortcuts to other screens on bottom of page, with that for alarm screen in bottom left hand corner.

During "normal" operation, should a problem be detected with respect to the system, a message in the **message line** will appear on the panel view of operator interface 80PV1.

Should an alarm occur, a banner will be superimposed over the screen at hand and the alarm will automatically be registered. This alarm must be acknowledged and cleared before proceeding. The **alarm banner** is shown below:


SECOND ALARM
PRESS TO CLEAR ALARM

All alarms are registered on the **alarm screen** where an alarm history may be viewed and managed. This alarm screen looks as follows:



Using the **arrow keys**, the operator may highlite and select any of the alarms. Using the buttons on the right, the operator may **acknowledge** and/or **erase** all alarms. **Shortcuts to other screens** (press box) are located on the bottom of the page, which allow the operator to move out of this screen.

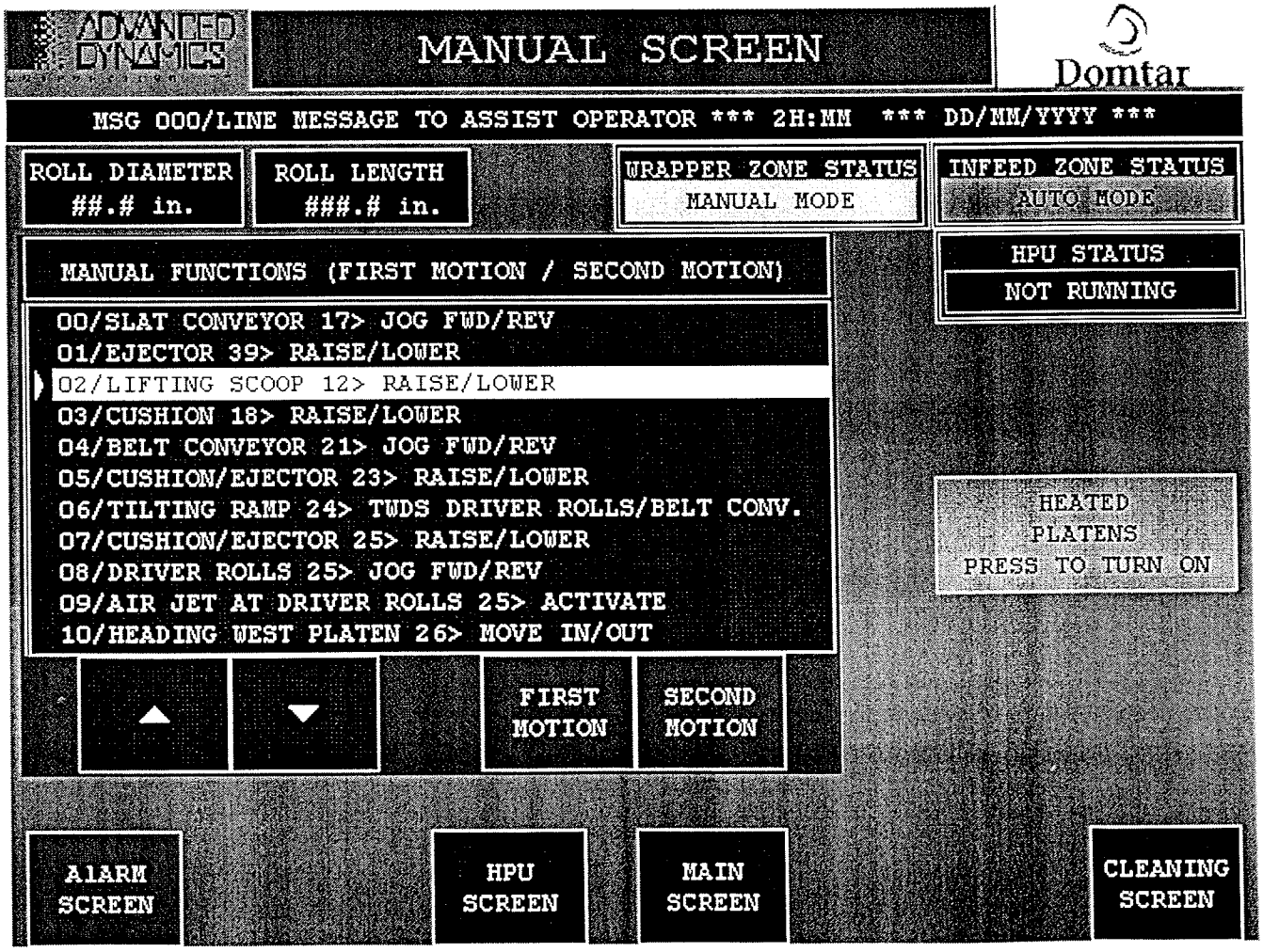
In manual mode, the operator may perform all of the manual functions listed in the above operator interfaces, except where noted, as well as all of the movements relating to the following equipments:

- Belt conveyor (section 21);
- Cushion/ejector 23 (section 23);
- Tilting ramp (section 24);
- Cushion/ejector 23 (section 23);
- Driver rolls (section 25);

- Heading machine (section 26);
- Crimping machine (section 27);
- Wrapper dispenser (section 28);
- Cutter/gluer (section 29);
- Upender (section 33);
- Discharge conveyor (section 34).

Note, actions that may be performed via operator interface 80PBS1 can be manually commanded via 80PV1 only when 80PBS1 is in manual mode and discharge state. In manual mode and load state, 80PBS1 governs the manual operations of the infeed zone.

On 80PV1, manual operations for maintenance, troubleshooting and re-positioning of equipments are commanded via the **manual screen** of the PanelView. Please see image of the manual screen below:



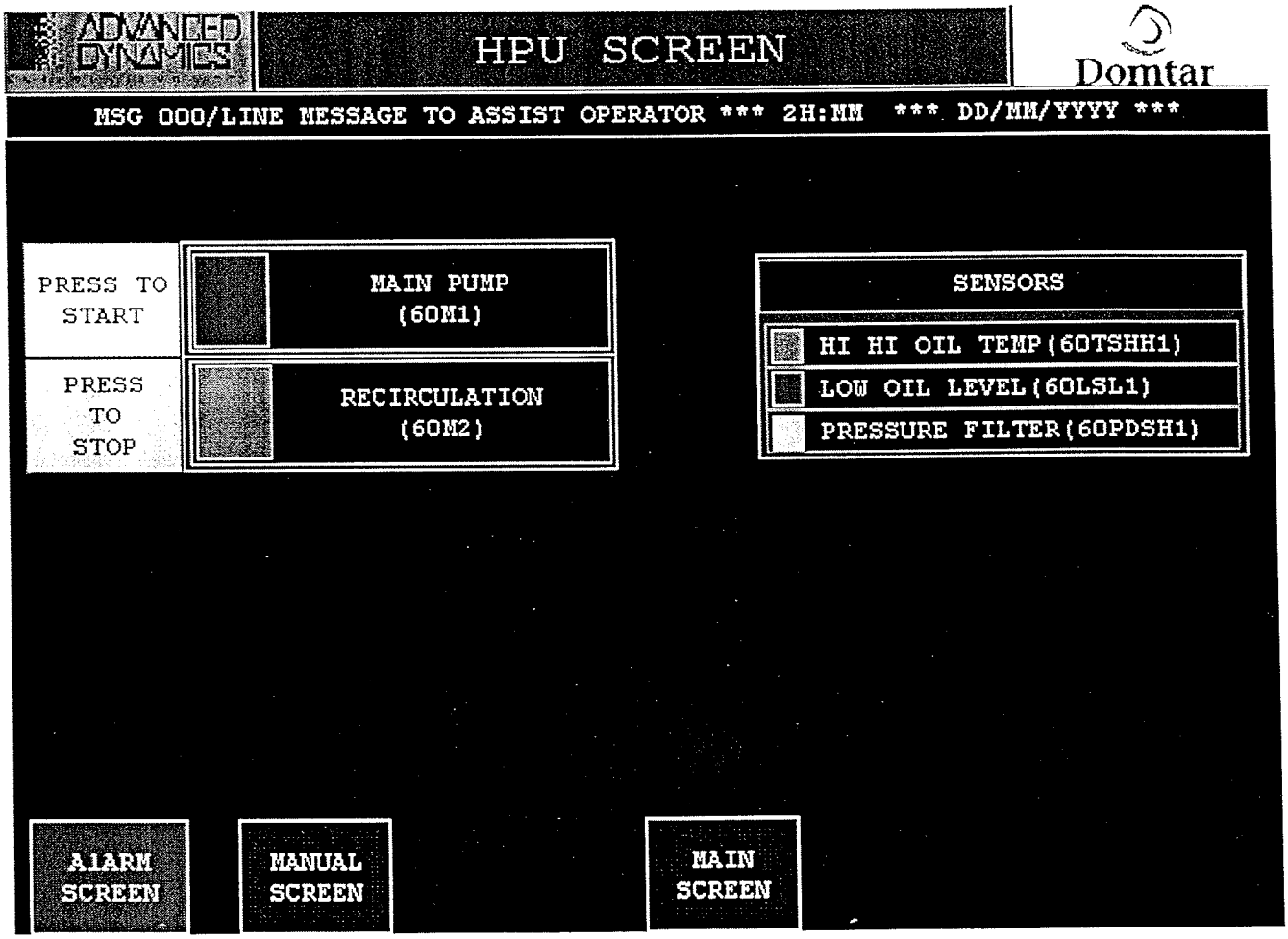
The actions are mainly achieved by first selecting the desired function using the **up/down arrows** (press box with arrow to change) in the **manual function block** on the manual screen of the PanelView. Next, choose the appropriate action as per the first/second action described in the selected function by selecting either the box with "**first motion**" or "**second motion**" as appropriate.

Exceptionally, a "pushbutton" is supplied in order to **turn the heated platens of the heading machine on/off** (this pushbutton becomes red when the heaters are on, with text "press to turn off").

Again, **shortcuts to other screens** (press box) are located on the bottom of the page, which allow the operator to move out of this screen. Note that it is only via the manual screen that the operator may reach the **cleaning screen** (which gives the operator 30 seconds to clean the screen with a damp cloth before it automatically returns to the manual screen). Again, the **message line** appears below the screen title and company logos.

On this screen, **roll data** is shown on the top left hand corner and the system's **zone** and **HPU status'** are shown on the top right hand corner.

With respect to the HPU, it has its own screen via which the main and recirculation pump/motor assemblies may be started/stopped. Note however that anytime the main pump/motor is run, the recirculation pump/motor will automatically run as well (in order to ensure proper cleaning of the hydraulic fluid in the reservoir). This **HPU screen** also shows the **status of the switches** supplied on the HPU. Typically, the color scheme is: red=bad, green=good, yellow=warning. *However, switches are not necessarily supplied with these 3 states, some may have 2 (bad/good)* – please see scope of supply for more details. Thus, the HPU screen looks as follows:

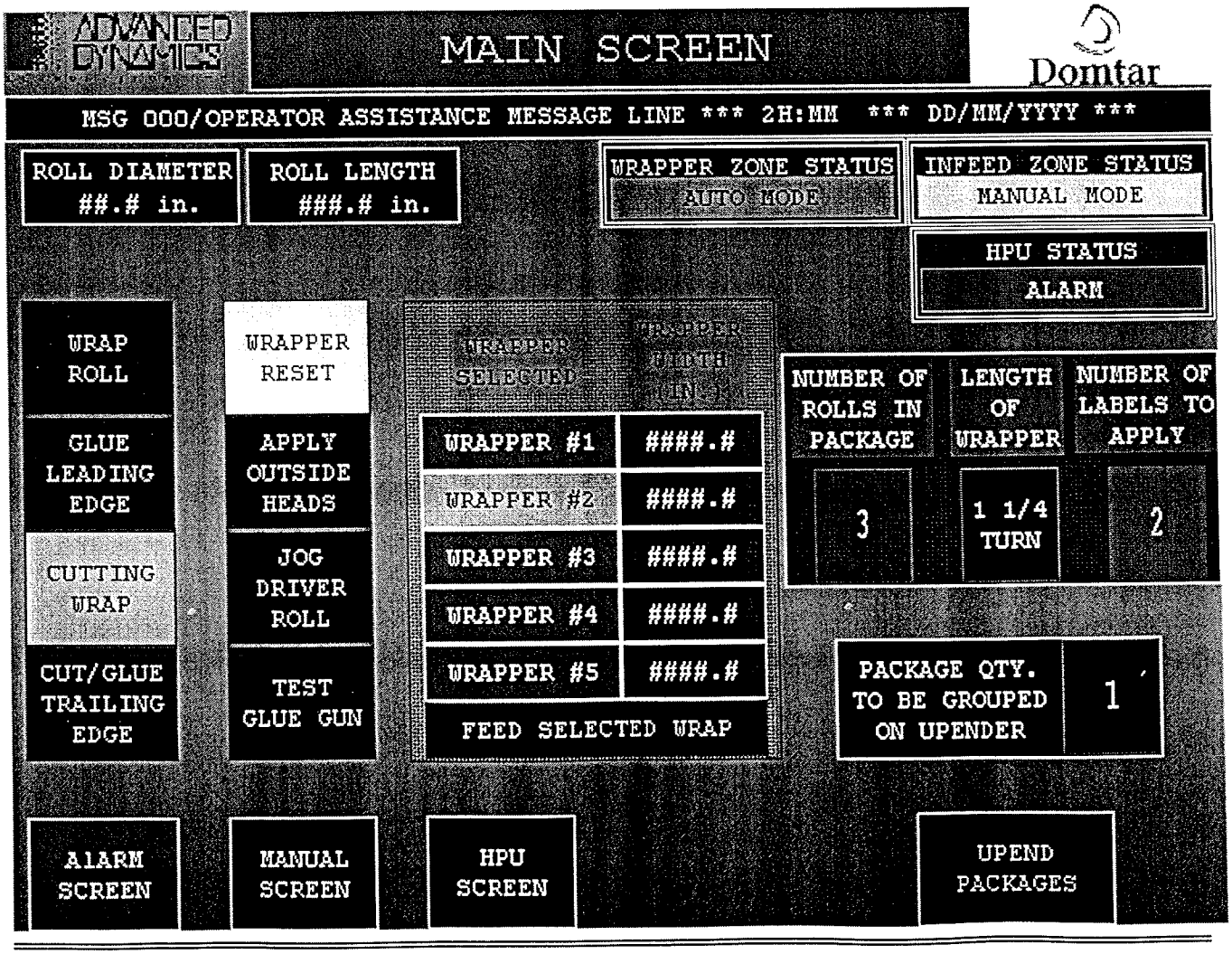


Once again, the **message line** and the **screen shortcuts** are in their usual areas.

In normal operation, the above screens of the PanelView will not be used much by the operator as he/she will spend most of the time in the **main screen**. The main screen informs the operator of the following, via text and/or color coding:

- **Roll length** and **roll diameter** information;
- **Infeed zone** status;
- **Wrapper zone** status;
- **HPU** status;
- **Wrapper width** at each backstand;
- **Wrapper selected** (by PLC or operator).

As previously, **shortcuts to other screens** (press box) are located on the bottom of the page, which allow the operator to move out of this screen. (Note that it is only via the manual screen that the operator may reach the **cleaning screen**.) And, typically, the **message line** appears below the screen title and company logos. The screen is displayed below:



To select the different possibilities with respect to the end product (wrapped and labelled package), the operator has the following choices (press box with variable to alter) – ***note, these choices must be entered in time in order to be performed as desired*** *(see details within list below):*

- **Number of rolls in package** (select 1-5, before ejecting roll into wrapper station from cushion/ejector 23; this affects the destination for grouping, crimping & heading)
- **Length of wrap** (select 1¼ or 2, before ejecting roll into wrapper station from cushion/ejector 23; this gives the approximate number of revolutions during which the roll will be wrapped);
- **Number of labels** to be applied (select 1 or 2, before ejecting roll into wrapper station from cushion/ejector 23; this tells the PLC if the roll must be rotated 180 degrees prior to ejection);
- **Package quantity to be grouped on upender** (select 1-3, before ejecting roll back onto belt conveyor 21 from cushion/ejector 25; this tells the PLC how many rolls to accept on the upender before upending).

As well, the operator is given the following commands which may be used in manual mode only – each of these are color coded with variable text in order to inform the operator which is in function (*note, only one may be performed at a time*):

- **Test glue gun** (to verify if the glue nozzles need to be cleaned – note, a cardboard should be placed under the glue gun prior to testing to avoid the accumulation of glue on the wrapper guide);
- **Jog driver roll** (this is in the normal direction of rotation only);
- **Feed selected wrap** (to feed highlited wrap);
- **Wrapper reset** (to reset any of the following "semi-automatic" functions)
- **Apply outside heads** ("semi-automatic" sequence to apply new outer heads onto a roll);
- **Cut/glue trailing edge** ("semi-automatic" sequence to cut & glue the trailing edge of a wrap feed – ensure the proper wrapper is selected so the glue is applied where it needs to be);
- **Cut wrap** ("semi-automatic" sequence to cut wrap);
- **Glue leading edge** ("semi-automatic" sequence to glue leading edge of wrap - ensure the proper wrapper is selected and the roll data is correct so the glue is applied where it needs to be);
- **Wrap roll** ("semi-automatic" sequence to perform complete wrap as in automatic mode).

Note, in order to perform any of the above "semi-automatic" sequences any of the wrapping equipment is stopped out of sequence, the operator must first press this reset wrap button, then the semi-automatic function that is desired in order to reset and activate it.

In automatic mode, the wrap width will be chosen automatically. However in manual mode, the operator can press on the desired wrap in order to feed it out. It is important that the wrap width shown be representative of the actual wrap width in each of the backstands. In order to change the shown **wrapper width**, the operator must press on the box with the width measurement for the desired backstand/wrapper stock. A pop-up keypad will appear via which the new wrapper width is to be entered. Once complete, the enter key must be pressed in order to register the new data and return to the main screen.

Lastly, another pushbutton remains in order to force, in manual mode, the upending of rolls on the upender, in case the operator did not enter the proper "quantity of packages to be grouped on upender". This is the button on the bottom right hand corner of the main screen, **upend packages**.

Note that, as in all cases, it is the operator's responsibility to ensure it is safe to perform this function prior to commanding it.

As a general note, other screens may appear to obtain information from the operator in order to clarify certain situations that may arise during exceptional circumstances during system operations, however these screens are not described as they are automatically controlled. In order to get back to the previous screen, the operator must simply answer the question(s) appropriately.