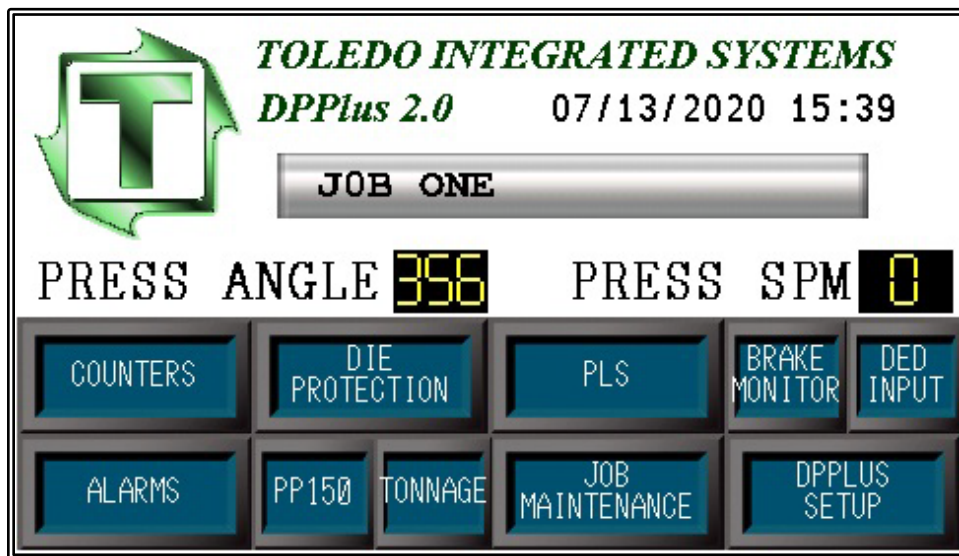# Toledo Integrated Systems
Toledo Transducers Inc.

DPPlus 2.0

Manual
And
Installation guide

Limited Warranty

The software and sensors are warranted by the manufacturer, Toledo Integrated Systems, to be free from defects in workmanship for one year from the date of the manufacturer's shipment. This warranty is limited to the functions of the DPPlus as stated in this manual.

All products subject to this warranty must be returned for examination, repair or replacement.

F.O.B. to: Toledo Integrated Systems
                6834 Spring Valley Drive
                Holland, OH 43528

The express warranty set forth herein is in lieu of all other warranties, expressed or implied, including without limitation any warranties of merchant-ability or fitness for particular purpose. All such warranties are hereby disclaimed and excluded by the manufacturer.

Repair or replacement of defective products as provided above is the sole and exclusive remedy provided thereunder. The manufacturer shall not be liable for any further loss, damages, or expenses, including incidental or consequential damages, directly or indirectly arising from the sale or use of this product. This includes any failure inside other manufacturers units that are tied into the DPPlus.

Any unauthorized repairs or changes to the program will void this warranty.

There are no warranties that extend beyond those expressly set forth herein.
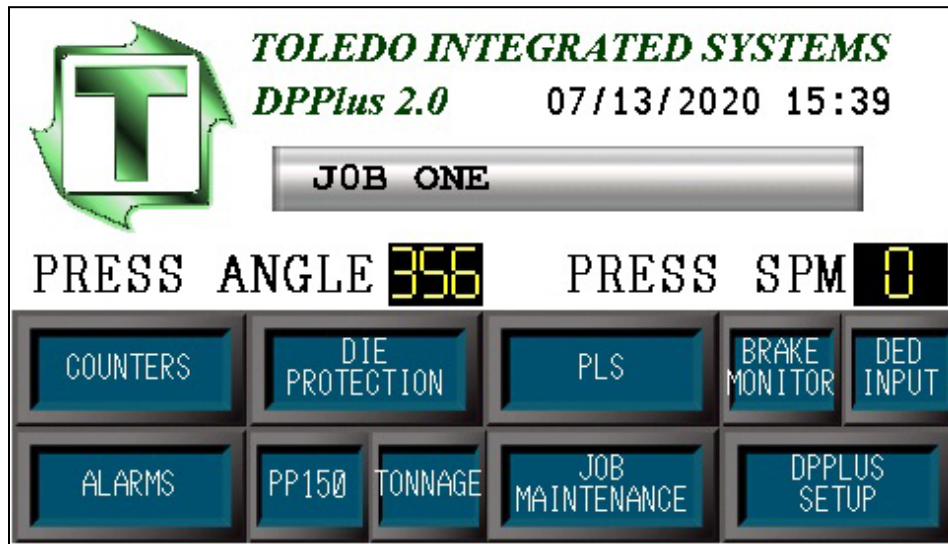
DPPlus Manual Revision 1.3

Table of Contents

SECTION 1 HOME SCREEN

Pressing the *<HOME>* key will bring up the Home Screen from any other screen.

1.1 PRESS ANGLE
This display shows the current angle of the press in degrees (0-359).

1.2 PRESS SPM
When the press is in motion, this will display the current strokes per minute.

1.3 NAVIGATION BUTTONS
At the bottom of the Home Screen are navigation buttons. Pressing a navigation button will display the corresponding screen. The *<PP150>* key is displayed only when the Press Pilot 150 option is enabled.

SECTION 2 COUNTERS SCREEN
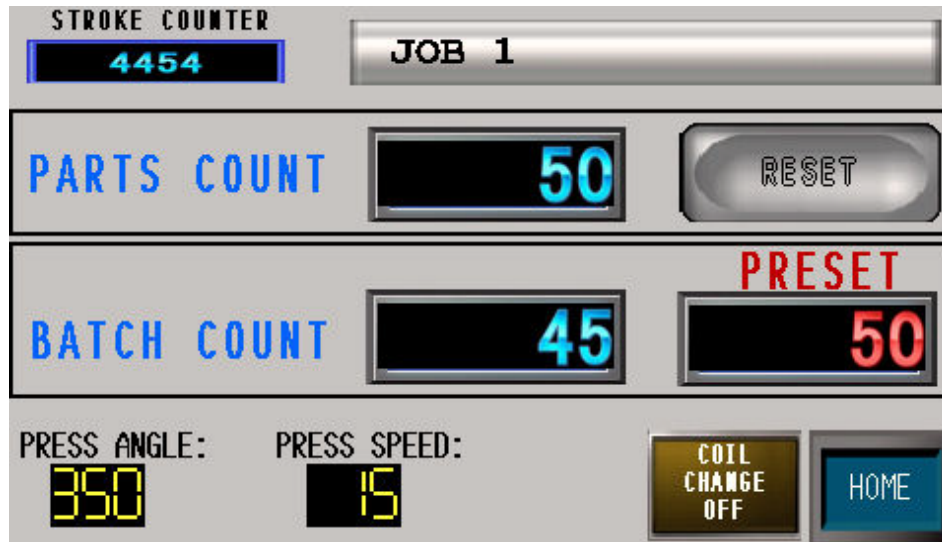
To access the Counters Screen, touch the *<COUNTERS>* key on the Home Screen.

2.1 PARTS COUNTER
This will display the number of parts produced since the last Parts Counter reset occurred. Touch the *<RESET>* key to set the Parts Count to zero.

2.2 BATCH COUNTER
The Batch Counter will count up as the press strokes. When the accumulated counter reaches the Preset value, the press will top stop and indicate that the Batch Counter is finished. The operator will need to reset the counter to continue running by touching the *<BATCH DONE TOUCH TO RESET>* key.
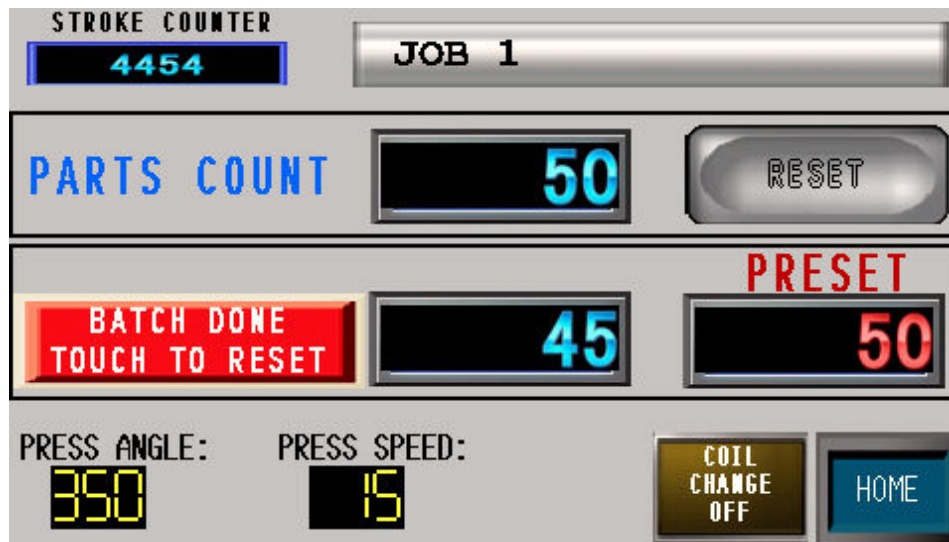
If the Batch Counter preset is set to 0, the unit will ignore the Batch Counter. To enter a Preset value, touch the Preset display and a numeric keypad will be displayed. Enter the desired value and touch the *<ENT>* key. See the image below.

3.1 DIE PRO STATION SELECTION

To access the Die Protection Screen, touch the *<DIE PROTECTION>* key on the Home Screen. Here, the input status of each of the die protection station is indicated. Touching the name of a station will display Parameter Setup Screen for that individual die protection station. The system has the ability of adding an extra 8 stations. If purchased, the Die Pro 9-16 Button will appear.

This screen displays all of the settings to setup an individual die protection station. To edit any settings, the user must be logged in with a level 2 or higher password. Touch the <EDITS NOT ALLOWED> key and a keyboard will be displayed. Enter a valid password and touch the <ENT> key. Once logged in, the indicator at the top right of the screen will display "EDITS ALLOWED".

3.2 DIE PRO STATION NAME

To change the name of the Die Pro Station, touch the display in the center and at the top of the screen. The image above shows the keyboard that will pop up. Use that keyboard to enter the desired name for the Die Pro Station and touch the *<ENT>* key..

3.3 WINDOW ON/OFF

The WINDOW ON setting is the angle of the stroke at which the DPPlus will start looking at the station input, and the WINDOW OFF setting is the angle of the stroke at which the DPPlus will stop looking at the station input. To set either of these parameters, touch the numeric display on the screen, and a keypad will appear. Type the desired value and touch the *<ENT>* key. The valid range for WINDOW ON and WINDOW OFF settings is 0-359 degrees. (For example, the part should eject from the press between 190 and 350 degrees. In this case the WINDOW ON should be set at 190 and the WINDOW OFF should be set at 350.) The degrees between the WINDOW ON and WINDOW OFF will be referenced as Look Window.

3.4 FREQUENCY

The FREQUENCY sets how often, in strokes, the event should take place. If the event needs to happen every stroke, set the FREQUENCY to "1". If the event needs to happen every other stroke, set the FREQUENCY to "2". The minimum FREQUENCY value that may be entered is "1", and the maximum value is "99".

3.5 CONTACT

To set this display to match the type of sensor that is being used, touch the CONTACT display until the correct option appears. NORMALLY OPEN states that the contact will be made <u>when</u> the event occurs. NORMALLY CLOSED states that the contact will be made <u>until</u> the event occurs.

3.6 LOOK TYPE

The four different Looks that can be selected are: MOMENTARY, MAINTAINED, STATIC W/WINDOW, and STATIC. Touch the LOOK TYPE display until the desired setting appears.

MOMENTARY: When using this method, the event must happen momentarily during the Look Window. The fault will not occur until after the Look Window OFF angle. The probe must also switch state outside of the window or a probe fault will occur.

MAINTAINED: When using this method, the contact must change state during the Look Window, it must maintain that state throughout the rest of the window. The probe must also switch state outside of the window or a probe fault will occur. The fault will not occur until the Look Window OFF degree if the switch doesn't turn on. Once the switch turns on, the fault will occur immediately if it turns off again within the window.

STATIC W/ WINDOW: When using this method, the contact must turn on during the entire Look Window. The probe must also switch state outside of the window or a probe fault will occur. The fault will occur immediately in this window if the switch is not on.

STATIC: This method sets the event to happen during the entire stroke. The look window is ignored.

Note: To reset a die protection alarm when Static is selected, the station must be on or in the non-fault state before a fault can be reset.

3.7 STOP TYPE

If a fault occurs on a Die Protection Station, the press will stop according to the type of stop chosen. Touch the STOP TYPE display until the desired setting appears.

TOP:	The press will stop on top.
IMMEDIATE:	The press will stop immediately.
SAFE:	The press will stop immediately if the fault occurs before the Die Protection Safe Stop Degree. This angle is configured in the DPPLUS SETUP screen. See section 9.5.

3.8 BYPASS IN COIL CHANGE

To bypass the Die Pro Station while in Coil Change mode, touch the BYPASS IN COIL CHANGE indicator. The only options are either YES or NO. For an explanation of Coil Change Mode, refer to Section 10 Coil Change.

3.9 RESET DIE PRO FAULT

Once a Die Pro fault has occurred, the fault must be reset before the press may cycle. Touch the red fault indicator at the bottom of the screen to reset the fault. See the image below, which indicates a STATION FAULT.

3.9a DIE PROTECTION PROBE FAULT

This fault occurs if the sensor did not change state during a press cycle. Sensor could be damaged.

3.9b DIE PROTECTION STATION FAULT

This fault occurs when the necessary event did not happen on a Die Protection Station.
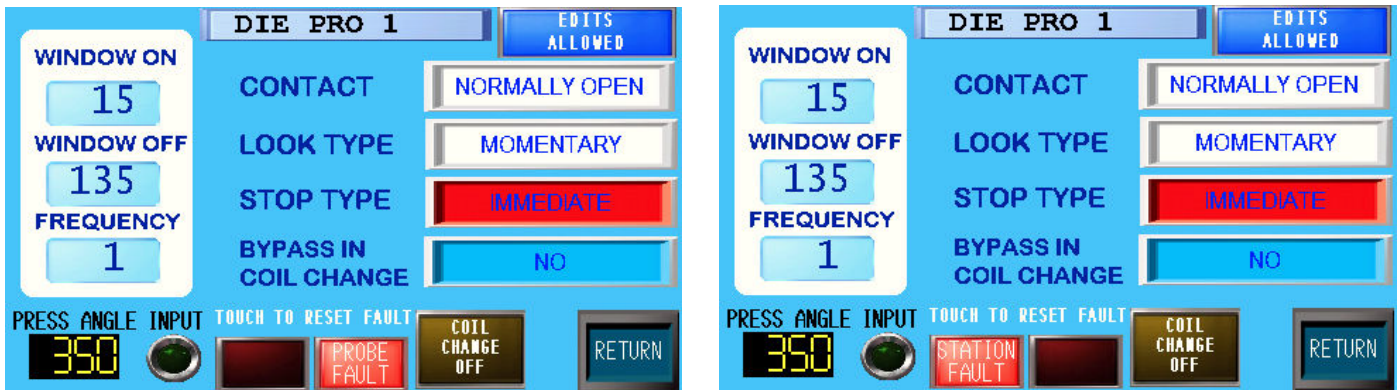
3.10 LAST ON/OFF

	LAST ON	LAST OFF
SHORT FEED	350	170
PART OUT	200	210
DIE PRO #3	0	0
DIE PRO #4	0	0
DIE PRO #5	0	0
DIE PRO #6	0	0
DIE PRO #7	0	0
DIE PRO #8	0	0

RETURN

Touching the *<LAST ON/OFF>* key will display the Last On/Off Screen. This screen displays the last on and last off degree of all die protection stations.

4.1 PROGRAMMABLE LIMIT SWITCH SELECTION

To access the Programmable Limit Switches Screen, touch the *<PLS>* key on the Home Screen. Here, the operator may choose the desired PLS by touching the name of the PLS. The image below shows the setup screen for an individual PLS.

To edit any settings, the user must be logged in with a level 2 or higher password. Touch the <EDITS NOT ALLOWED> key and a keyboard will be displayed. Enter a valid password and touch the <ENT> key. Once logged in, the indicator at the top right of the screen will display "EDITS ALLOWED".

4.2 PLS ON/OFF

The ON setting is the degree of the stroke at which you want the switch to turn on and the OFF setting is the degree of the stroke at which you want the switch to turn off. To cycle once per stroke, program the ON1 and OFF1 settings. The switch can be programmed to cycle twice per stroke, by using the ON2 and OFF2 in addition to ON1 and OFF1. The valid range for ON and OFF settings is 1-359.

> **NOTE:** **To prolong the life of the output relays, set limits for unused limit switches to "0" for both on and off.**

4.3 FREQUENCY

Frequency is how often you want the switch to turn on. The value entered is in strokes, and the maximum setting is 99. If the switch needs to be turned on with every stroke, set the Frequency to "1." If the switch needs to be turned on with every other stroke, set the Frequency to "2".

4.4 TIME

When using the Time feature, the switch will turn on according to the ON setting, and turn off after the amount of time (in milliseconds), specified in the Time display, has elapsed or the OFF angle has been achieved, whichever comes first. This feature can be used with functions such as lube and air blow off, to prevent problems caused if the press is stopped for any length of time while at a degree where the switch is still enabled. A setting of 0 will disable the time feature.

NOTE: Always use surge suppression on the coils of devices driven by the PLS

5.1 BRAKE MONITOR

To access the Brake Monitor Screen, touch the *<BRAKE MONITOR>* key on the Home Screen. There are two columns of data on this screen. The Current column displays data from the most recent stop. The Last Test column displays data from the most recent 90 degree stop test. See section 9.7 for editing the Brake Monitor settings.

SECTION 6 ALARMS SCREEN

6.1 CURRENT ALARMS

To access the Alarms Screen, touch the *<ALARMS>* key on the Home Screen. Here, the operator may view the list of current alarms. The image below shows an example of a station fault at the Die Pro Stations #1, #5, and #4. Touch the current alarm to open the page that allows the individual alarm to be reset.

6.2 ALARM HISTORY

To access the Alarm History Screen, touch the *<ALARM HISTORY>* key on the Current Alarms screen. The Alarm History Screen displays the list of alarms that have occurred. See image below.
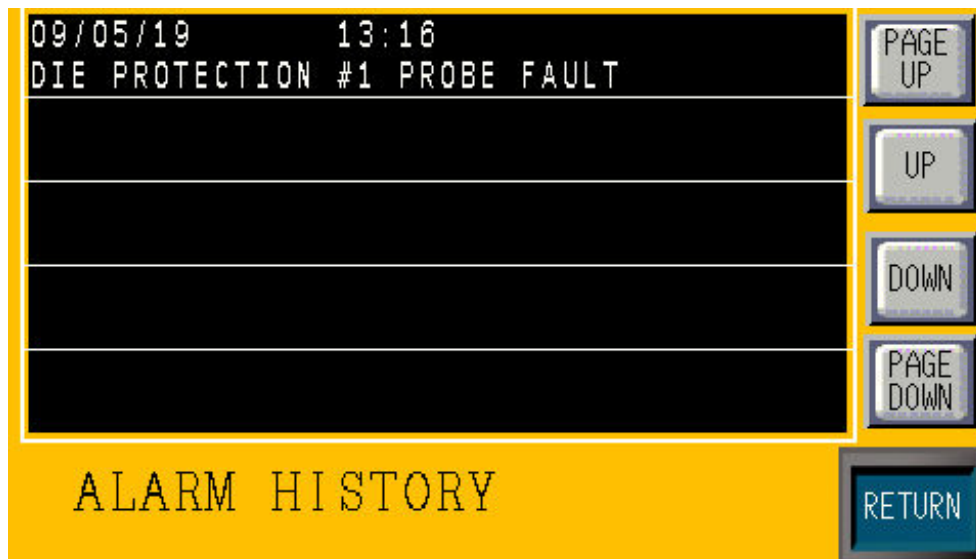
SECTION 7 PP150 SCREEN

7.1 PP150

To access the Press Pilot 150 Screen, touch the *<PP150>* key on the Home Screen. This screen displays the CURRENT PROMPT on the Press Pilot 150 and the LAST STOP REASON. To view the Fault History Screen for the Press Pilot 150, touch the *<FAULT HISTORY>* key. See the image above.

7.2 PP150 FAULT HISTORY

This screen shows (1) the most recent fault, (2) the previous fault, (3) and two faults ago. Previous faults are added to the Alarm History (see section 6). The fault number and a brief description are given. See the image below.
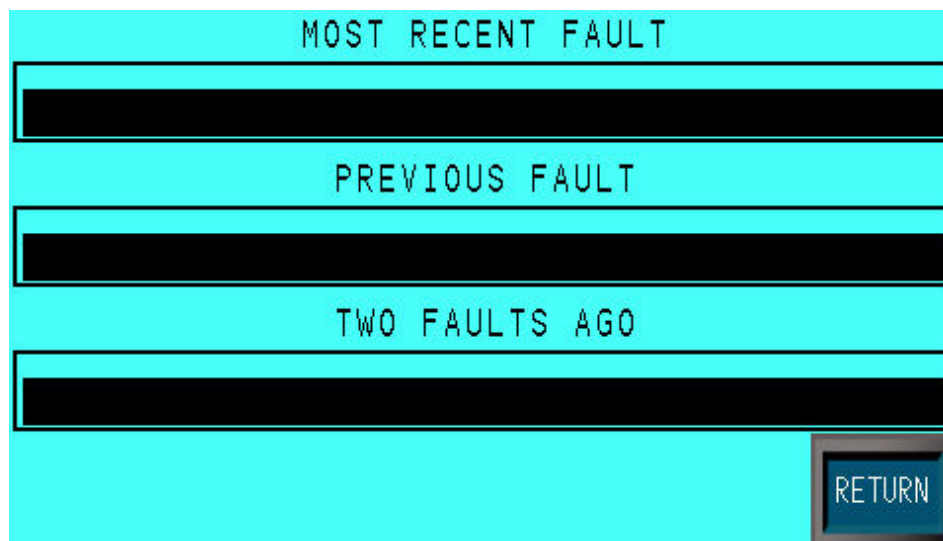
7.3 PP150 I/O

To access the Press Pilot 150 I/O Screen, touch the *<PP150 I/O>* key on the PP150 Screen. There are three screens total. Scroll through the screens by touching the arrows.

All inputs and outputs are shown. If the indictor next to the name of a signal is lit blue, the signal is currently on. See images below.
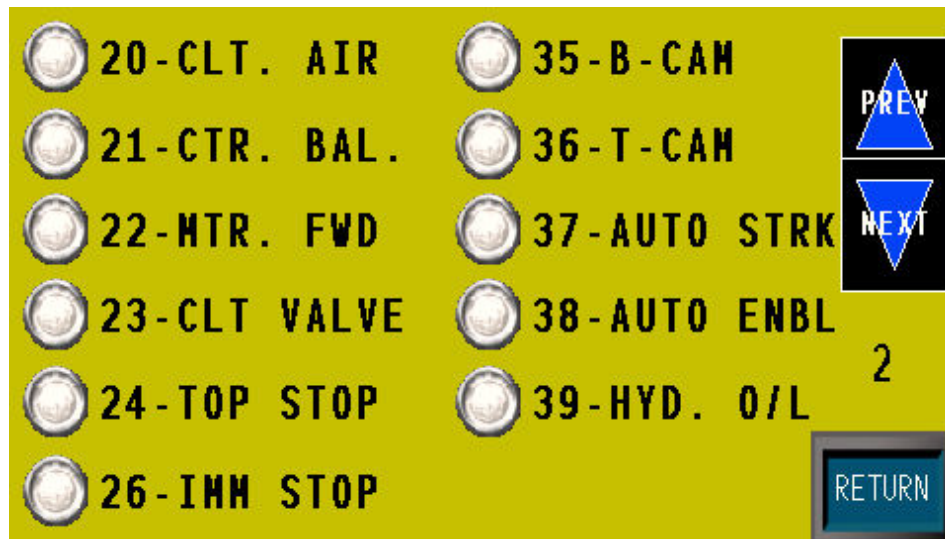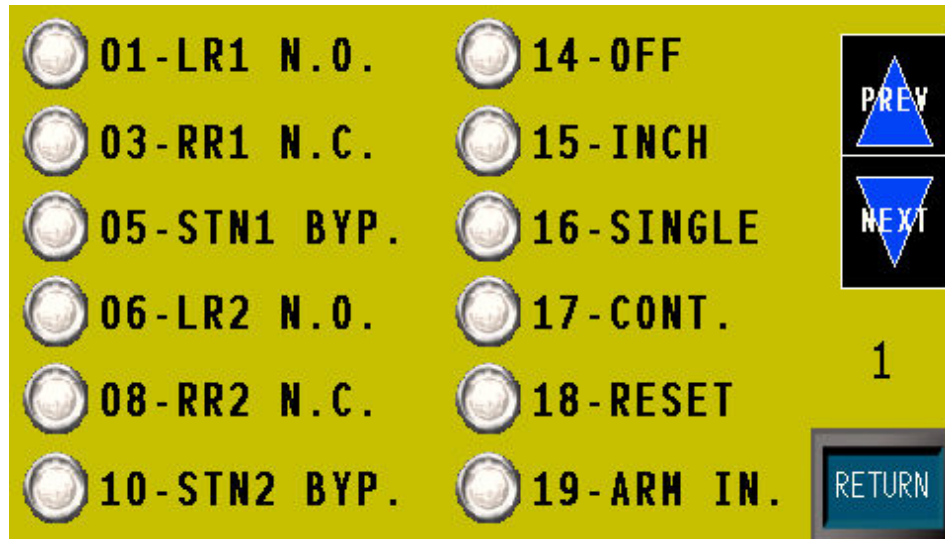
40-LR3 N.O. CLUTCH RLY
42-RR3 N.C. WDOG RLY
44-STN3 BYP. MUTE RLY
45-LR4 N.O. ESTOP-1
47-RR4 N.C. ESTOP-2
49-STN4 BYP.

PREV
NEXT
3
RETURN

NOTE: Login level 2 or higher is required to access any of the functions on this screen.

8.1 JOB MAINTENANCE

To view information about the current job, use the *<JOB MAINTENANCE>* button on the home screen to be sent to the Job Maintenance Screen. From this screen, the current job name and job number can be seen. Use the *<LOAD NEW JOB>* button to access the Job Change Screen. To copy the current job to a new one, use the *<COPY CURRENT JOB>* to open the Job Copy Screen. To edit the name of the current job touch the display at the top of the screen and enter the desired name. Touch the *<ENT>* key when done. See figure below.

8.2 LOAD NEW JOB

To load a new job, the operator must touch the *<LOAD NEW JOB>* key. The following screen will appear to confirm that all data from the currently running job is to be saved.
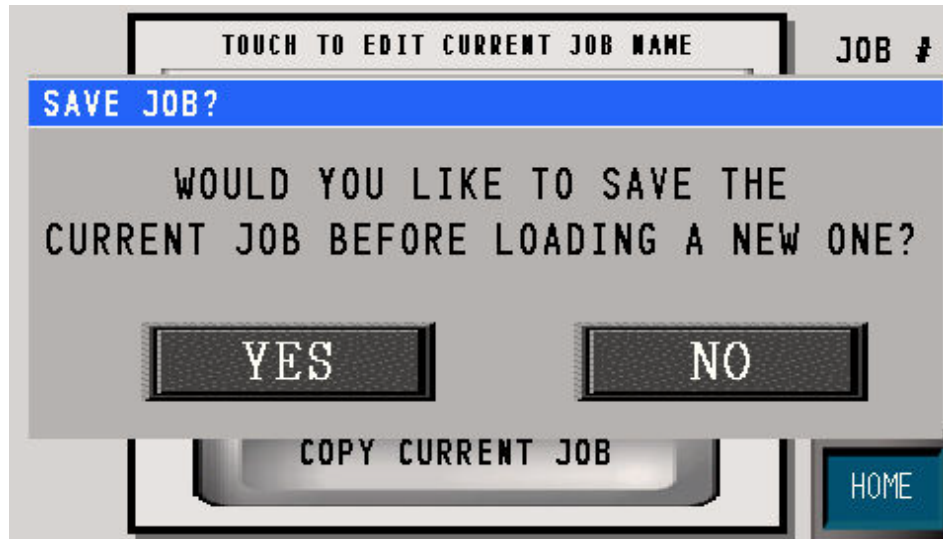
After the operator touches the <YES> or <NO> key, the screen with the list of current jobs will appear. To select a new job to load, touch the display containing the name of the desired job. See the image below.

8.3 SAVE CURRENT JOB

To save the data for the current job, the operator must touch the *<SAVE CURRENT JOB>* key. The following screen will appear to confirm that all data from the currently running job is saved.

8.4 COPY CURRENT JOB

To copy the data from the current job to another job, the operator must touch the *<COPY CURRENT JOB>* key. The following screen will appear where the operator may choose a job to copy the Current Job to.
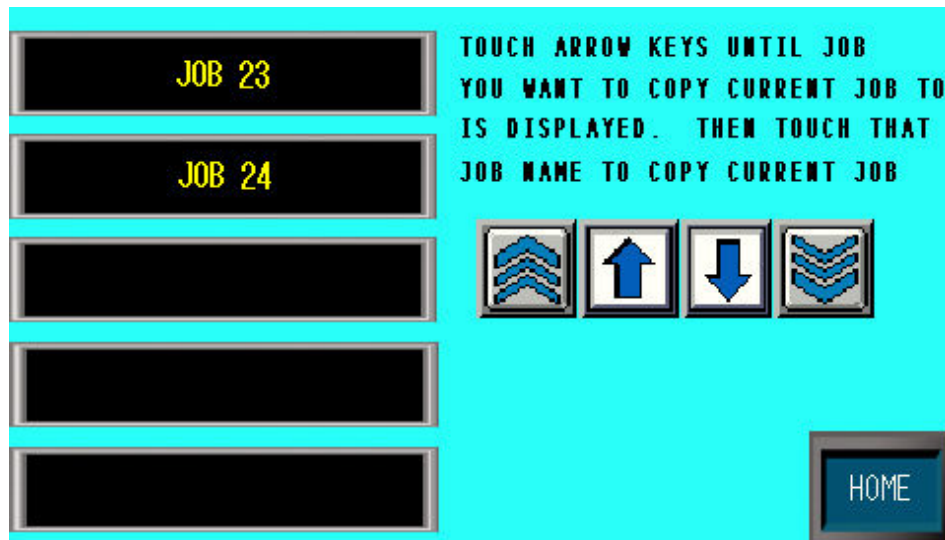
SECTION 9 DPPLUS SYSTEM SETUP SCREEN

NOTE: The options in the first two columns on this page require a level 3 password, while the third column requires a level 2 password.

To access the DPPlus Setup Screen, touch the *<DPPLUS SETUP>* key on the Home Screen. The user must be logged in at a level that will allow access to the items on this screen. Once properly logged in, the following screen will appear.

NOTE: This password is a different password than the one used for access to the other screens.
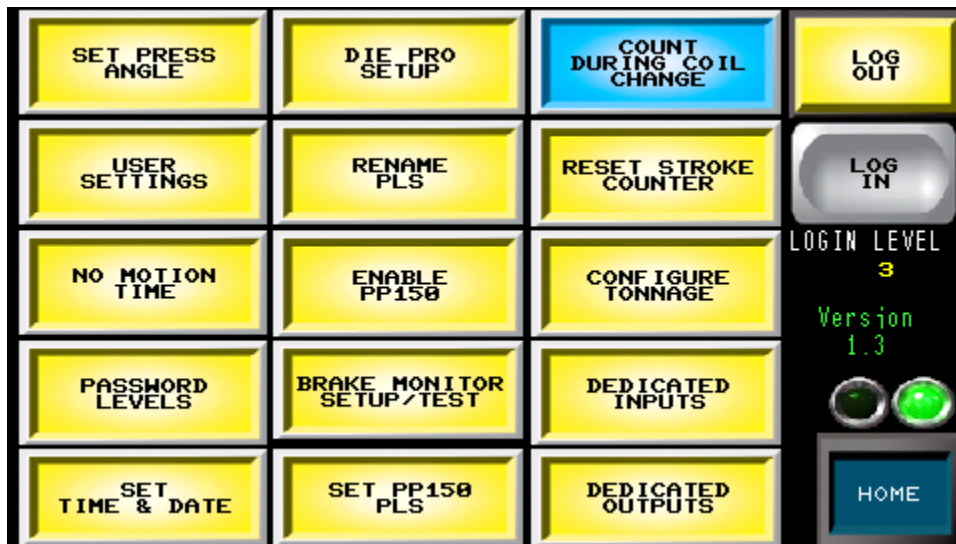
9.1 SET PRESS ANGLE

To set the press angle, touch the *<SET PRESS ANGLE>* key on the DPPlus Setup Screen.

```
          PRESS ANGLE SETTINGS

              DESIRED ANGLE
                                    T-CAM OFF
                  0
                                       0


          DPPLUS ANGLE      PP150 ANGLE
             350                0          RETURN
```
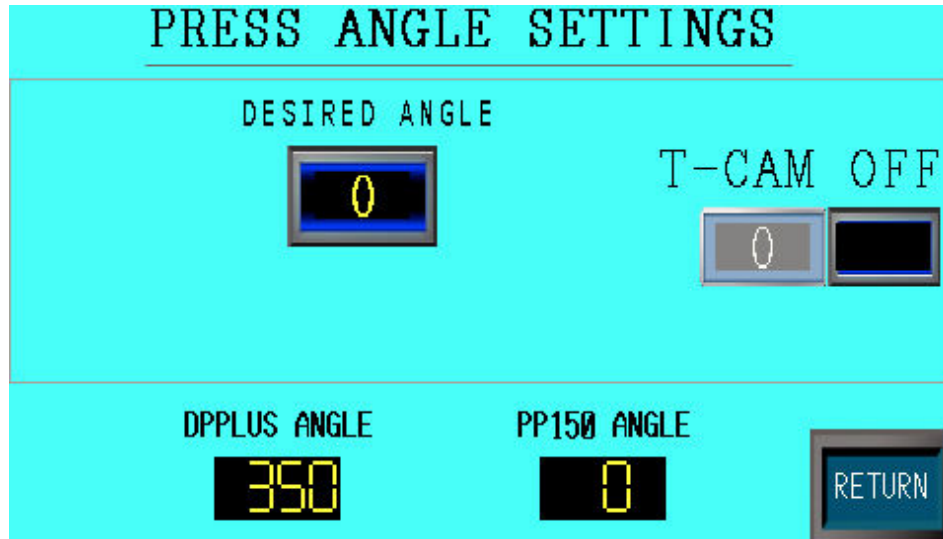
Touch the numeric display below DESIRED ANGLE, and a keypad will pop up. Use that keypad to enter the desired press angle. There are two situations to be aware of:

1) **If using a resolver** enter current press position to change resolver angle. *Note: touching "Enter" will change the angle immediately.*
2) **If using an encoder** enter current press position to change encoder angle. *Note: touching "Enter" will not change the angle immediately. You must stroke press 1 revolution in inch mode to save encoder position.*

The T-CAM OFF is the angle in which the PP150 will release the clutch and engage the brake. Touch the numeric display below T-CAM OFF, and a keypad will pop up. Use that keypad to enter the desired T-Cam Off angle. Entering a zero will bypass the screen's setting and use what is set in the PP150.

9.2 USER SETTINGS

To change user level and password, touch the *<USER SETTINGS>* key on the DPPlus Setup Screen.
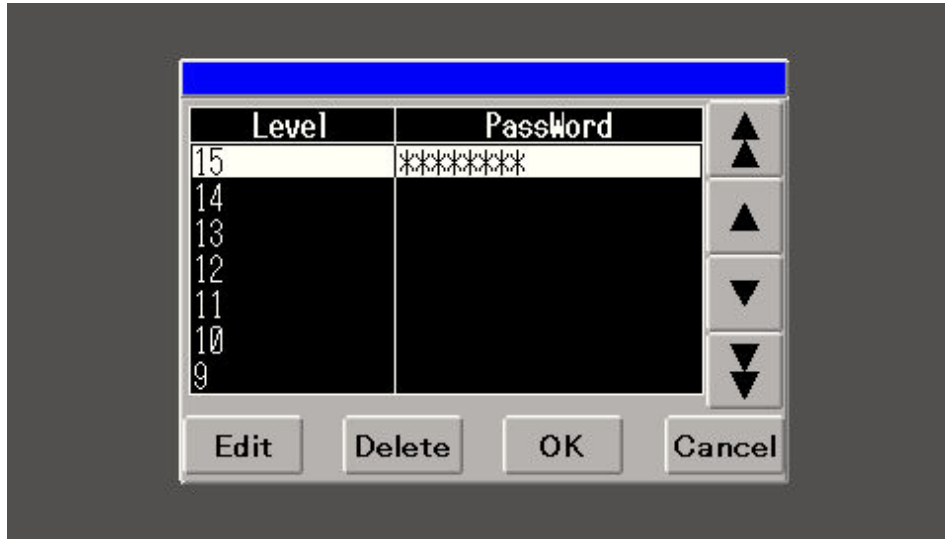
To change the password for an access level, scroll to the desired Level and touch the *<Edit>* key. A keyboard will pop-up, use this keyboard to enter the new password. Touch the *<OK>* key and the DPPLUS SETUP screen will appear. To erase the password assigned to an access level, scroll to that level and touch the *<Delete>* key.

9.3 RENAME PLS

To rename a PLS, touch the *<RENAME PLS>* key on the DPPlus Setup Screen. Touch the name of the PLS that is to be changed. Use the keyboard that pops up to enter the new name.
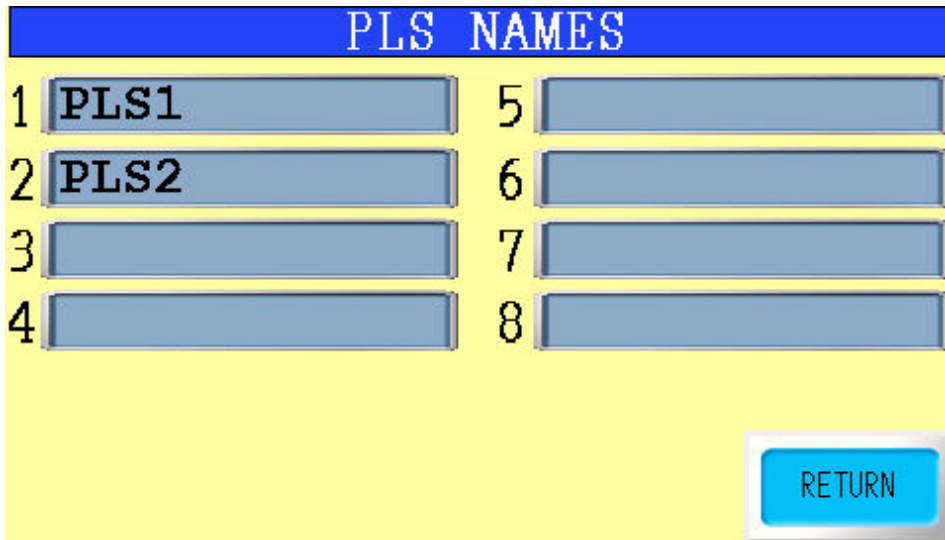
9.4 DEDICATED OUTPUTS

To rename either dedicated output and adjust the settings, touch the *<DEDICATED OUTPUTS>* key on the DPPlus Setup Screen.
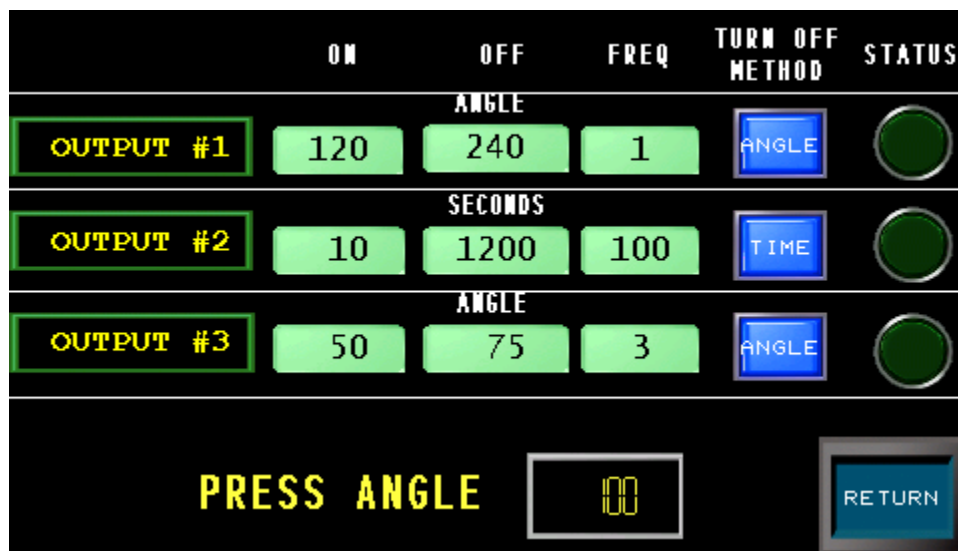
The dedicated outputs are set once and will not change with the job. They can be set up to turn on and off with an angle or set to turn on with an angle and off after a time has elapsed.

Examples from above screen:

OUTPUT #1 is set to turn on at 120 degrees and turn off at 240 degrees every stroke.

OUTPUT #2 is set to turn on at 10 degrees and stay on for 1200 seconds every 100 strokes. The stroke counter will start counting again after the timer times out.

OUTPUT #3 is set to turn on at 50 degrees and turn of at 75 degrees every third stroke.

Touch the name of the Dedicated Output that is to be changed. Use the keyboard that pops up to enter the new name.

Touch the display of the ON and/or OFF angle that is to be changed. Use the keyboard that pops up to enter the new angle.
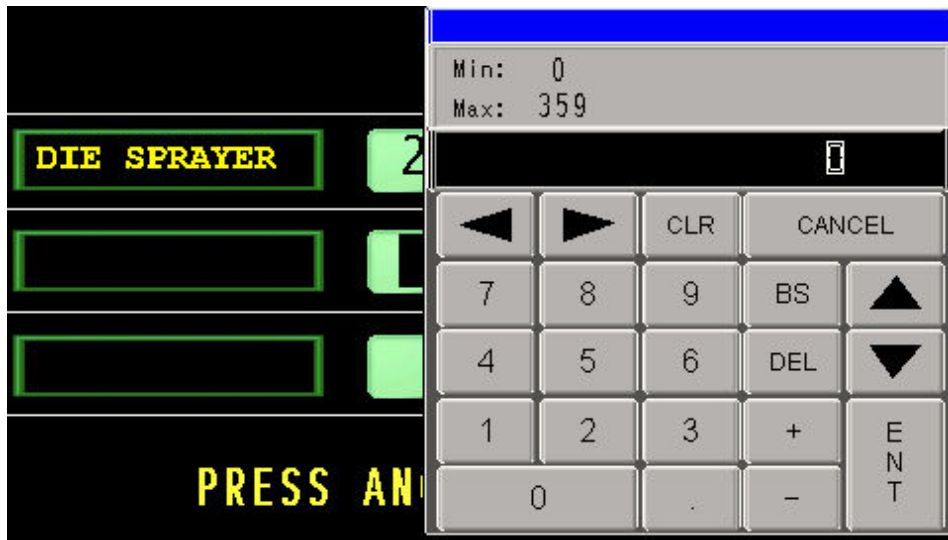
9.5 DIE PROTECTION SETUP

This screen allows you to enter in the Safe stop degree and choose 8 or 16 Die Protection Stations.

Touch the display of the angle, and use the keyboard that pops up to enter the new angle.

To change the number of Die Protections stations, select the number of stations purchased.

9.6 NO MOTION TIMER

To change the allowable time for a No Motion Fault, touch the *<NO MOTION TIME>* key on the DPPlus Setup Screen.

Touch the display of the time and use the keyboard that pops up to enter the new time.

Note: The time entered uses milliseconds as units.

9.7 BRAKE MONITOR SETTINGS

To change the Brake Monitor Settings, touch the *<BRAKE MONITOR SETUP/TEST>* key on the DPPlus Setup Screen.
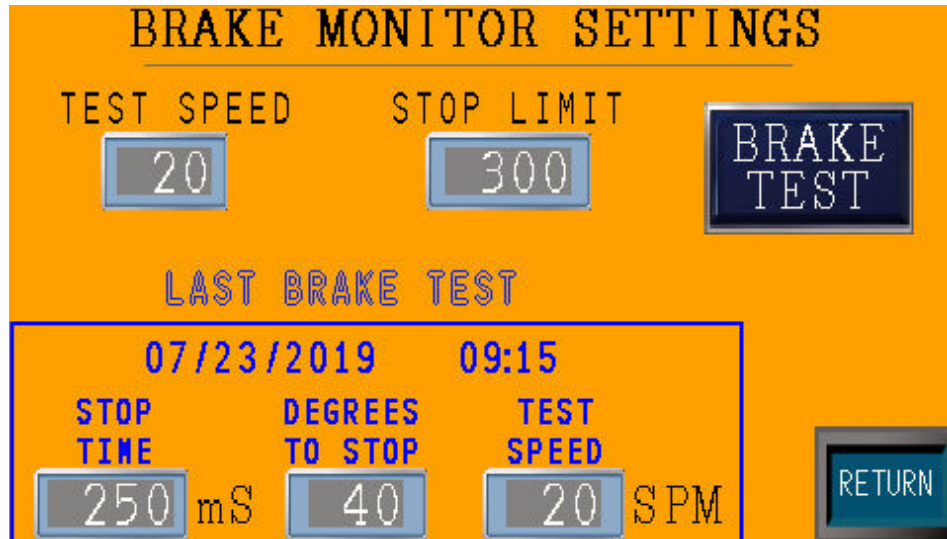
9.7a TEST SPEED

The Test Speed is the minimum speed the press needs to exceed during a 90 degree brake test. The units for this parameter are strokes per minute (SPM).

9.7b STOP LIMIT

The Stop Limit is the maximum duration of time, in milliseconds (mS), that can occur for the press to stop. Anytime the time duration for the press to stop exceeds the Stop Limit, a fault will occur.

9.7c BRAKE TEST

Touch the *<BRAKE TEST>* key to begin a 90 degree brake test. This test will release the clutch and engage the press brake at 90 degrees if the SPM is greater than the Test Speed. The Stop Time, Degrees To Stop, and Test Speed will be monitored and recorded to the Last Brake Test section.

9.8 TIME & DATE

This screen is accessed by touching the *<SET TIME & TIME>* button on the calibration screen. To alter a parameter, tap it and hit enter when the desired value is set. Touch the *<APPLY>* button to save the changes.
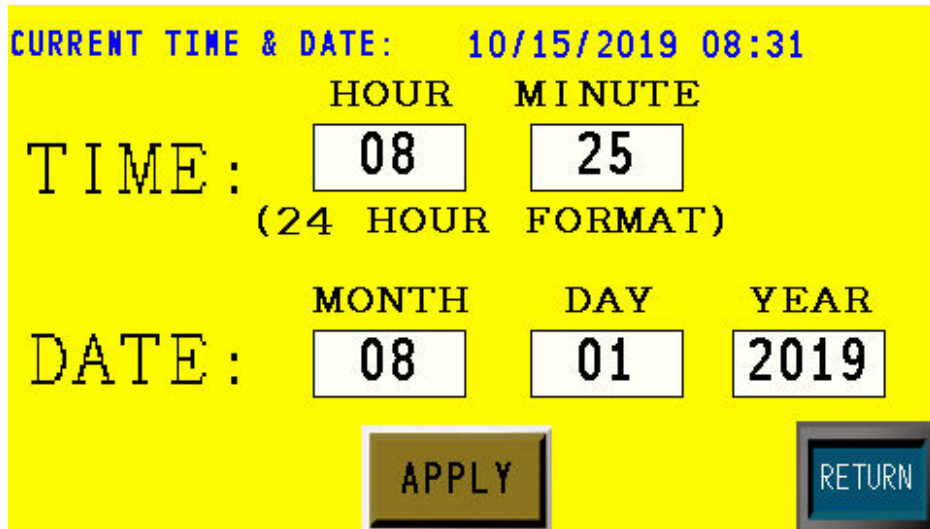
9.9 PASSWORD LEVELS

To change password levels for screens, touch the *<PASSWORD LEVELS>* key on the DPPlus Setup Screen.
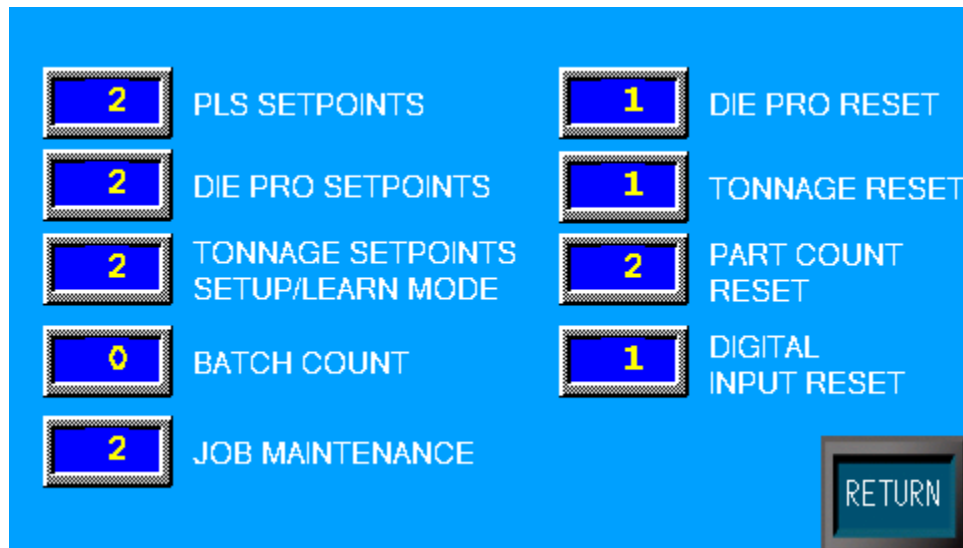
The DPPlus has 4 levels of password protection (0-3). Level 3 is the highest level of password protection and is required to access most screens on the DPPlus Setup Screen.

SECTION 10 COIL CHANGE

While loading the stations in a progressive die, some of the sensors may not make, causing nuisance faults. Also it may not be desirable to count parts during this time. To compensate for this, a Coil Change feature has been incorporated into the DPPlus unit.

The Coil Change feature can bypass Die Protection sensors (if selected to do so) and stop the counters (if selected to do so). The Coil Change feature can be enabled by turning on the Coil Change input.

The Coil Change will remain on while the input is on, and will turn off when the input turns off. An example of this would be to wire to the inch mode selector switch of the press control.

Note: This input is 24VDC sinking.

SECTION 11 DEDICATED INPUT
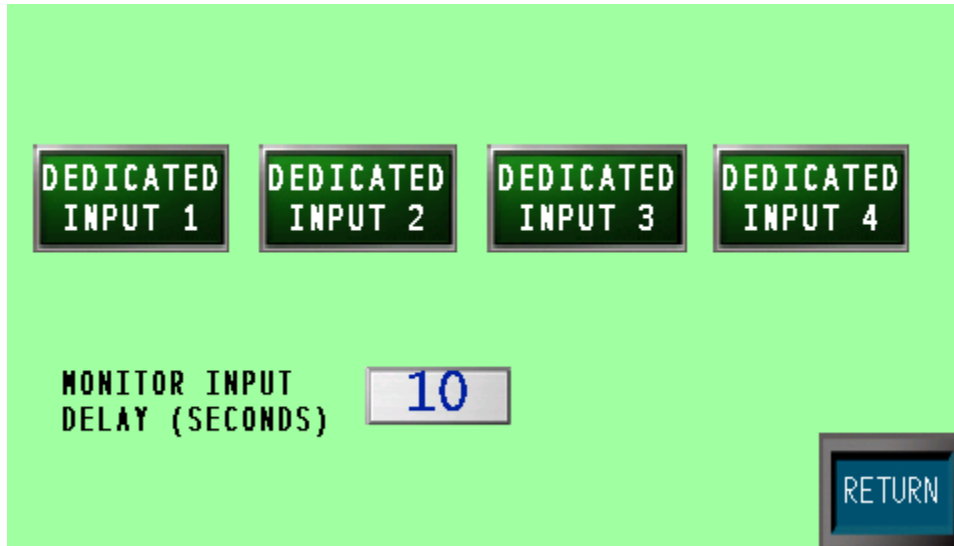
To access the Dedicated Inputs Screen, touch the *<DEDICATED INPUTS>* key on the DPPlus Setup Screen.

11.1 MONITOR INPUT DELAY
This is the amount of time that the system waits after the Monitor Input comes on before evaluating the dedicated input. The Monitor Input Delay only functions if the Input Delay box is checked on a dedicated input.

11.2 DEDICATED INPUT SELECTION
The operator may choose the desired dedicated input by touching the name of the dedicated input.

11.3 DEDICATED INPUT NAME
To change the name of the Dedicated Input, touch the display in the center and at the top of the screen. Use the pop-up keyboard to enter the desired name for the Dedicated Input and touch the *<ENT>* key.

11.4 ACTIVATE
Touch this box to either activate or deactivate this input. If the station is inactive, all other boxes will disappear.

11.5 TIED TO MONITOR INPUT
If this box is checked, the dedicated input will not be monitored until the monitor input is on. If this box is not checked, the cyclic and input delay fields will not be visible.

11.6 STATIC
If this box is checked, the dedicated input will monitor for a static state and will fault if not in the proper state. This depends on whether the Fault If Off box is checked or the Fault If On box is checked at the bottom of the screen.

11.7 CYCLIC
If this box is checked, the unit will monitor the dedicated input to make sure that it is
cycling enough times as set by Minimum Cycles Per Second at the bottom of the screen.

11.8 TOP STOP / IMMEDIATE STOP
If the press is faulted, it will stop. The type of stop depends on whether Top Stop box is
checked or Immediate Stop box is checked.

11.9 INPUT DELAY
If this box is checked, the system will not evaluate this input for the amount of time
specified in the Monitor Input Delay. (See Section 11.1)

11.10 MIN. CYCLES PER SECOND
This is the amount of cycles of the input that must be seen in the amount of seconds
specified or a fault will occur. This setting only appears if the Cyclic box is checked.

11.11 MONITOR
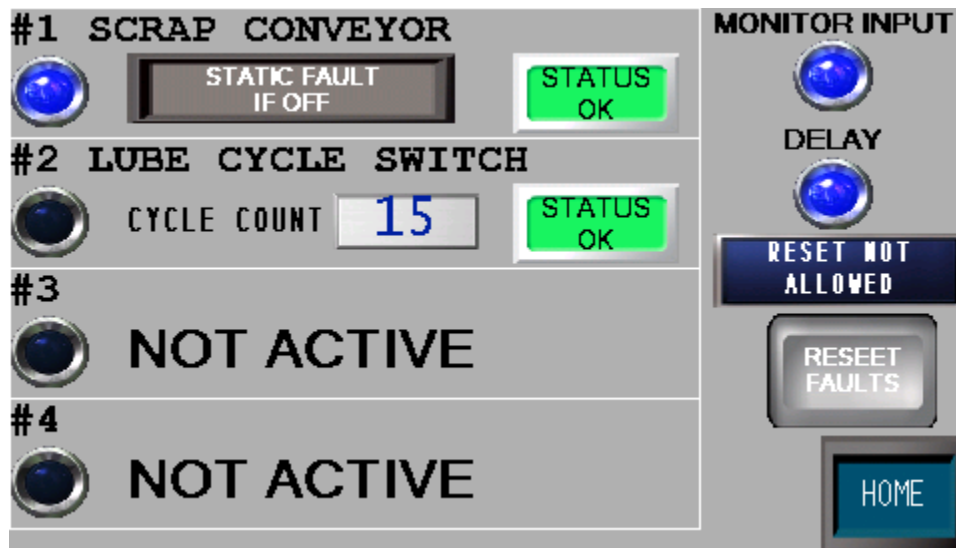
To access the Dedicated Inputs Monitor Screen, touch the *<DED INPUT>* key on the
Home Screen. This screen shows the status of all the dedicated inputs as well as the
monitor input and monitor input delay. The faults can also be reset from this screen.

SECTION 12 TONNAGE MONITOR OPTIONAL
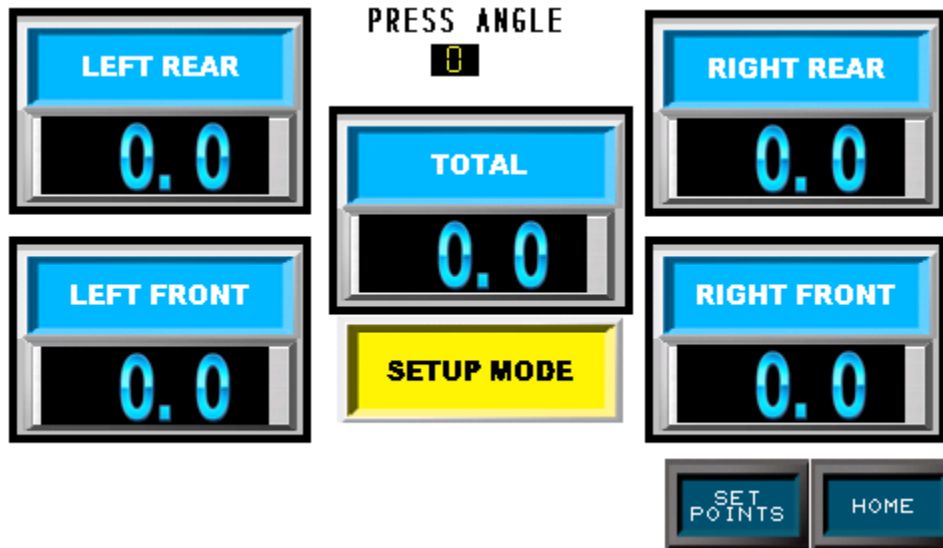
To access the Tonnage Monitor Screen, touch the *<TONNAGE>* key on the Home Screen.

12.1 DESCRIPTION

The tonnage monitor shows the peak tonnage seen by each corner of the press during the stroke. It can be set up to recognize high and low limits for each corner and the total. It will react to these limits by alarming and stopping the press.

If an alarm does occur, the corner or corners that are alarmed will turn red and display the reason for the alarm (over capacity, over high limit or under low limit).

12.2 RESET ALARMS

To reset an alarm, touch the corner that is alarmed. After resetting, the corner will stop flashing. If no corners are alarmed, the press is allowed to run.

CAUTION: **Before resetting any alarm, the cause for the alarm should be investigated and corrected.**

12.3 CHANGE MODE

The display below TOTAL tells you which mode the tonnage monitor is currently in. It can be is used to place the tonnage monitor in either **SETUP** mode or **LEARNING NEW BENCHMARK (RUN)** mode by touching it.

SETUP

While the tonnage monitor is in **SETUP** mode, it will only alarm and stop the press if press capacity limits are exceeded. Put in **"SETUP"** mode until you can repeat good parts.

RUN

After a die is set and ready to run production, the tonnage monitor should be put into **RUN** mode. This will activate your high and low limits. The display directly below the total display will read **"LEARNING NEW BENCHMARK".** This means that the tonnage monitor is taking an average of the next eight (8) hits and will recalculate high and low limits according to the percentages entered in the setpoints screen. When this is done, the display will the read RUN mode.

CAUTION: **Leaving the monitor in setup mode during a production run could result in damage to the die.**

12.4 HOME

The *<HOME>* key will bring up the home screen.

12.5 SETPOINTS

The *<SET POINTS>* key will bring up the setpoints screen.

12.6 SETPOINTS SCREEN

	L.R.	R.R.	L.F.	R.F.
CALCULATE NEW	**EDITS ALLOWED**			**RETURN**
CAPACITY	0.0	0.0	0.0	0.0
HIGH SETPOINT	0.0	0.0	0.0	0.0
BENCHMARK	0.0	0.0	0.0	0.0
LOW SETPOINT	0.0	0.0	0.0	0.0
HI PERCENT	0	0	0	0
LOW PERCENT	0	0	0	0

The setpoints screen displays capacity of the press, high setpoint, benchmark, low setpoint and the percentages above and below the benchmark used to calculate the high and low setpoints for each channel.

12.7 CAPACITY

This display shows the capacity of the press for each channel and the total. These are set during calibration and cannot be changed from this screen. While the tonnage monitor is in **SETUP** mode, the capacity is the only setpoint that is active.

12.8 HIGH SETPOINT

This display shows the high setpoint. If this is exceeded, the tonnage monitor will alarm and stop the press. These values are calculated automatically when the tonnage monitor is put into **RUN** mode. These values can be changed by pressing the desired display to activate the display keypad. Simply key in the new value on keypad and press **ENTER**.

12.9 BENCHMARK

This display shows the benchmark tonnage which was used to calculate the high and low limits. These values cannot be changed. As discussed in section 12.3, the benchmark is obtained by taking an average of the first eight press cycles while the unit is in **RUN**.

12.10 LOW SETPOINT

This display shows the low setpoint. If the tonnage falls below this value, the tonnage monitor will alarm and stop the press. These values are calculated automatically when the tonnage monitor is put into **RUN** mode. They can be changed by touching the desired display. Then simply key in the new value on keypad and press **ENTER**.

12.11 % ABOVE BENCHMARK

This display shows the percentage above the benchmark that the tonnage monitor uses to calculate its high limits. The range is from 0% to 99% (0 = press capacity). They can be changed by touching the desired display. Then simply key in the new value on keypad and press **ENTER**. Once all the percentages are correct, touch the *<CALCULATE NEW>* key to calculate the new high limits. *Due to press/machine characteristics, we suggest that you set the limits to 20% at first. After you see the normal tonnage fluctuations you can refine it closer. This will prevent unwanted shutdowns.*

12.12 % BELOW BENCHMARK

This display shows the percentage below the benchmark that the tonnage monitor uses to calculate its low limits. The range is from 0% to 99% (0 = no low alarm). They can be changed by touching the desired display. Then simply key in the new value on keypad and press **ENTER** Once all the percentages are correct, touch the *<CALCULATE NEW>* key to calculate the new low limits. *Due to press/machine characteristics, we suggest that you set the limits to 20% at first. After you see the normal tonnage fluctuations you can refine it closer. This will prevent unwanted shutdowns.*

12.13 RETURN

The *<RETURN>* key will bring up the tonnage monitor screen.

12.14 CONFIGURE TONNAGE

From the DPPlus Setup screen, touch the *<CONFIGURE TONNAGE>* key. Select the option purchased.

12.15 CALIBRATE TONNAGE

The *<CALIBRATE TONNAGE>* key will bring up the Tonnage Calibration screen.

12.16 CALIBRATION

	L.R.	R.R.	L.F.	R.F.
TOUCH FOR CAL MODE		TONNAGE CALIBRATION	RETURN	
CAPACITY	20.0	20.0	20.0	20.0
PEAK TONS	12.2	14.9	11.9	15.3
LOAD CELLS	19.6	19.2	20.0	18.5
POINTS/TON	54.2	51.7	60.3	58.4
ANALOG VOLTS	0.09	0.15	0.03	0.12
PEAK VOLTS	5.49	5.86	5.27	6.16

From this screen, the tonnage can be calibrated by following the listed steps.

STEPS

1) Touch the *<CALIBRATE TONNAGE>* key on the configure tonnage screen. It is assumed that the resolver is already set. 180 degrees should be at the bottom dead center.

2) Go to the calibration screen.

3) Move dipswitches on the ZT-4 unit to zero each channel:

```
OFF  [O ]  AZ
OFF  [O ]  PRB
TRK  [O ]  PEAK
ZRO  [O ]  GAIN
```

4) Zero each channel by turning the "Zero" pot on the ZT-4 and watching the output voltage of the channel using a digital voltmeter or by reading the **ANALOG VOLTS** on the calibration screen.

5) Move the dipswitches on the ZT-4 unit to adjust gain:

```
OFF [●□] AZ
OFF [●□] PRB
TRK [●□] PEAK
ZRO [□●] GAIN
```

6) Turn the "Span" pot for each channel on the ZT-4 until the "Zero/Span Voltage" values read approximately 2.5 volts on the voltmeter or by reading the **ANALOG VOLTS** on the calibration screen.

7) Move the dipswitches on the ZT-4 unit back to capture peak:

```
OFF [●□] AZ
OFF [□●] PRB
TRK [□●] PEAK
ZRO [●□] GAIN
```

8) Return to the calibration screen.

9) Enter the capacity of each channel by touching the desired channel. Key in new value and press enter. Repeat for each channel. Each channel will represent a column or a side of the press. For example: An 800-ton straight side press with a sensor on each corner should have a 200 entered for each corner. A 250-ton c-frame should have 125 tons in both channels.

10) Now, while the die is out of the press, inch the slide to the bottom dead center and measure the distance from the ram to the bed. Make sure the load cells will have safe clearance. Carefully place the load cells in the bed of the press. *You may have to use solid steel spacers to take up the gap.* Cycle the press carefully without making contact with the load cells. Continue to cycle the press after lowering the slide around .005 inches each time. You will begin to increase the tonnage. Increase the tonnage up to the capacity of the load cells or the capacity of the press. *(The load cells may be lower than the press capacity.)* You will probably have to shim to make the load cells read even tonnage. One sheet of paper should equal around one ton reading on the load cell.

11) Touch the *<TOUCH FOR CAL MODE>* key.

12) Make another press cycle while you are at the capacity of the press.

13) Under the **"LOAD CELLS"** heading enter in the reading of each channel's

tonnage from the load cells. To enter the desired tonnage, touch the desired channel. Key in the value from the load cell and press Enter. Repeat for each channel.

Note: You will not have to adjust the span to make the tonnage reading change as in other types of tonnage monitors. After entering the desired tonnage, the software will automatically do this.

14) Touch the *<ACCEPT CAL>* key. The system will then automatically come out of **Cal** Mode.

15) Roll the press over and record the "Actual" values. Test the linearity by raising the slide adjust and watching the "Actual Tonnage" displayed versus the load cells tonnage displayed. Record these values at different shut heights to confirm the accuracy through the whole range. This information is valuable if questions arise over accuracy at the lower tonnage ranges.

16) Return to Calibration screen and record **POINTS/TON**.

17) Calibration is complete.

NOTE: **Check the "PEAK VOLTS" while at capacity. The ZT-4 will saturate at 10 volts. It is a good practice to allow room for the tonnage to display above capacity. If your peak volts at capacity is too close to 10 volts, you may need to decrease gain values and recalibrate. We suggest that your PEAK VOLTS at capacity should be between 4.0 to 6.0 volts.**

USER NOTES

USER NOTES

REVISION HISTORY

9/2019   REV 1.0   Initial Release

7/2020   REV 1.1   Added Tonnage, Password Levels, Die Protection On/Off, and Dedicated Inputs

12/1/2021   REV 1.2   Made Static W/ Window non resettable until sensor in correct state

12/14/2021 REV 1.2   Changed to Unconditional Start In Run so if battery dies, it will still go into run. Will need to load job at startup

3/21/2022   REV 1.2   Fixed bug for Die Protection #8 (window not turning on).

4/27/2022   REV 1.3   Added ability to have 16 die protection stations and changed dedicated outputs to have the ability to turn off with a time and also have a frequency.

APPENDIX A
DIE PROTECTION SETUP EXAMPLES

Listed are some setup examples for various common scenarios.

SHORT FEED
The short feed sensor senses when the material is advanced to the proper feed length by the feeder. If the feeder was set to feed from 220-300, then set the ON window to 220. This assures the unit is looking for the sensor to make as soon as the feeder starts to feed. Set the Off window so that if the material isn't sensed, the machine can stop in time. It could be set at any degree past 300. The contact type would typically be NO, and the Look would be Maintained. Setting the Look to Maintained ensures that the unit will fault if the material "drops back". The stop type would be up to the individual user, but if the Off Window is in the downstroke, E-Stop would be a recommended stop type. Coil Change bypass would be set to Yes. Prove Sensor Rst can be set either way based on the customer's preference.

BUCKLE DETECT
A buckle detect sensor senses when the material buckles up. This sensor will tell the unit to fault if it ever touches the material. To set this up, set the Look to Static. The On and Off windows are ignored as the window is the entire stroke. The contact would be NC. The Stop type could be either Top or E-Stop. The Coil Change bypass would be set to Yes. Prove Sensor Rst can be set either way based on the customer's preference.

PART OUT
A part out sensor senses when a part has passed by. The ON and OFF window would be set so that the part turns the sensor on while the window is on. The contact type would typically be NO, and the Look would be Momentary. The stop type would be up to the individual user, but if the Off Window is in the downstroke, E-Stop would be a recommended stop type. Coil Change bypass would be set to Yes. Prove Sensor Rst can be set either way based on the customer's preference.

CAMS WITHIN THE DIE
With some dies, there are sensors within the die which must be on during a certain window. These are sometimes cams within the die. To set up for this, the On and OFF window would be set to the window that the cam is supposed to be engaged. The contact type would typically be NO, and the Look would be Static W/ Window. The stop type would be up to the individual user, but if the Off Window is in the downstroke, E-Stop would be a recommended stop type. Coil Change bypass would be set to No. Prove Sensor Rst can be set either way based on the customer's preference.

APPENDIX A
PLS SETUP EXAMPLES

Listed are some setup examples for various common scenarios.

FEED INITIATE
One use of the PLS switches can be to trigger a feeder to feed instead of using a hard cam. Let's assume that the feeder is supposed to feed from 220-300. The ON 1 would be set at 220. The OFF 1 would be set at 300. The ON 2 and OFF 2 would both be set at 0 as the second window is not needed. The Freq will be 1, and the Time will be 0. Speed comp would be set if the press ran fast enough and the feeder required it.

DIE LUBE
Another use of the PLS switches can be to trigger die lube. Let's assume that it is to be lubed 2 times per stroke. The windows in this example are 90-110 and 300-10. To eliminate the possibility of the press stopping in the window and spraying lube all over the place, we will also enter in a time value. The ON 1 would be 90 and the OFF 1 would be 110. The ON 2 would be 300 and the OFF 2 would be 10. The Freq would be 1 as this is going to happen every stroke. The Time value would be some value that allows enough lube to spray while the press is running, but won't puddle the die with lube if the press stops in one of the windows. Anywhere from 500mS to 1000ms would be a good starting point. The speed comp could be either on or off depending on how crucial the angle to spray really is versus the speed.

APPENDIX A
DEDICATED INPUT SETUP EXAMPLES

Listed are some setup examples for various common scenarios.

SCRAP CONVEYOR

This shows an example of a static input. In this case, if the scrap conveyor is not running, the press will be given a top stop command.

LUBE CYCLE SWITCH

This shows an example of a cyclic input. In this case, the prox. on the lube cycle block would need to see 20 cycles per every 60 seconds. It is tied to the monitor input which would be wired to the lube starter. The unit would start monitoring the input for cycles after the delay programmed on the previous page (Dedicated Inputs Screen). If it does not achieve enough cycles, the press will be given a top stop command.

APPENDIX B
DRAWINGS
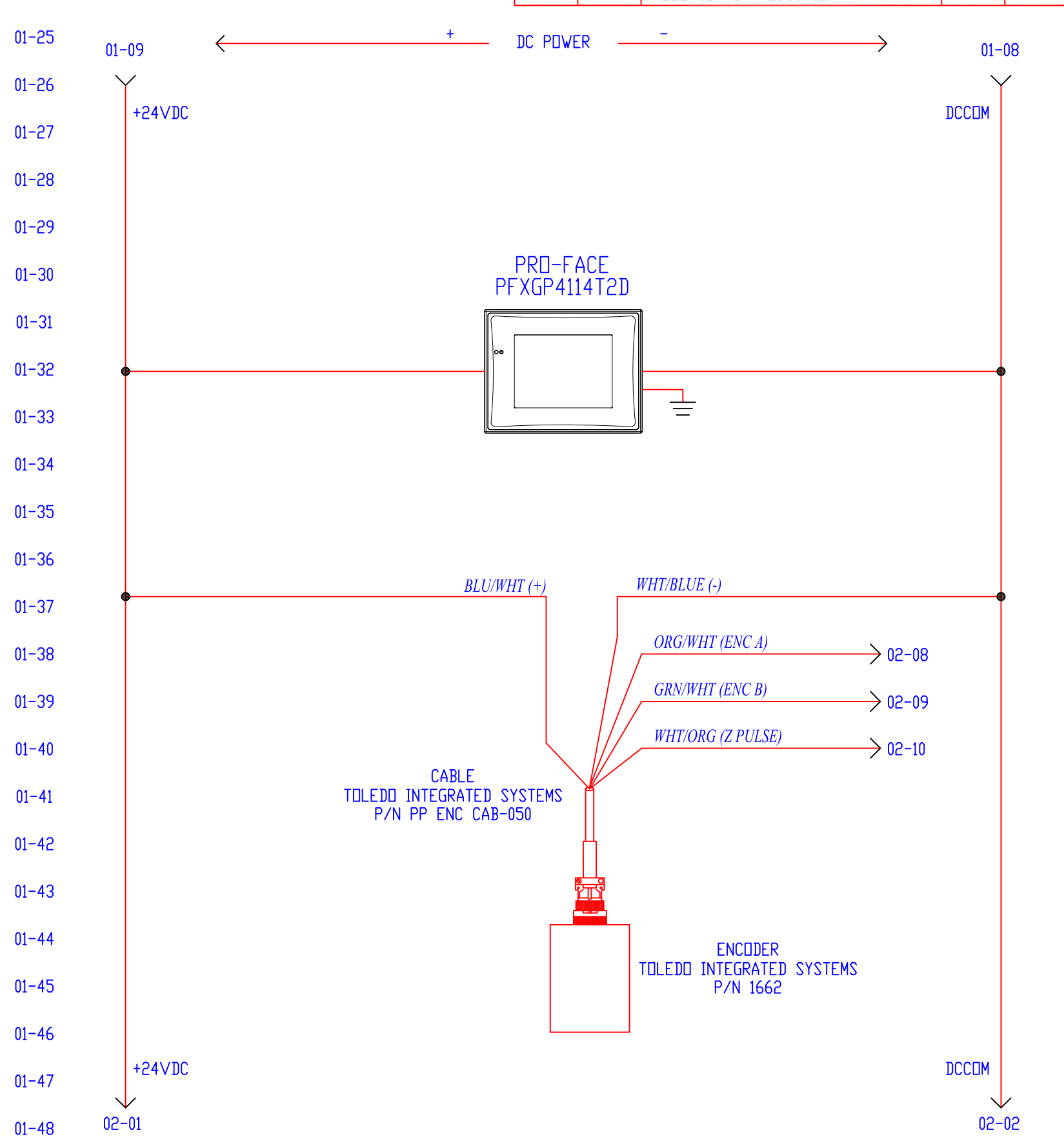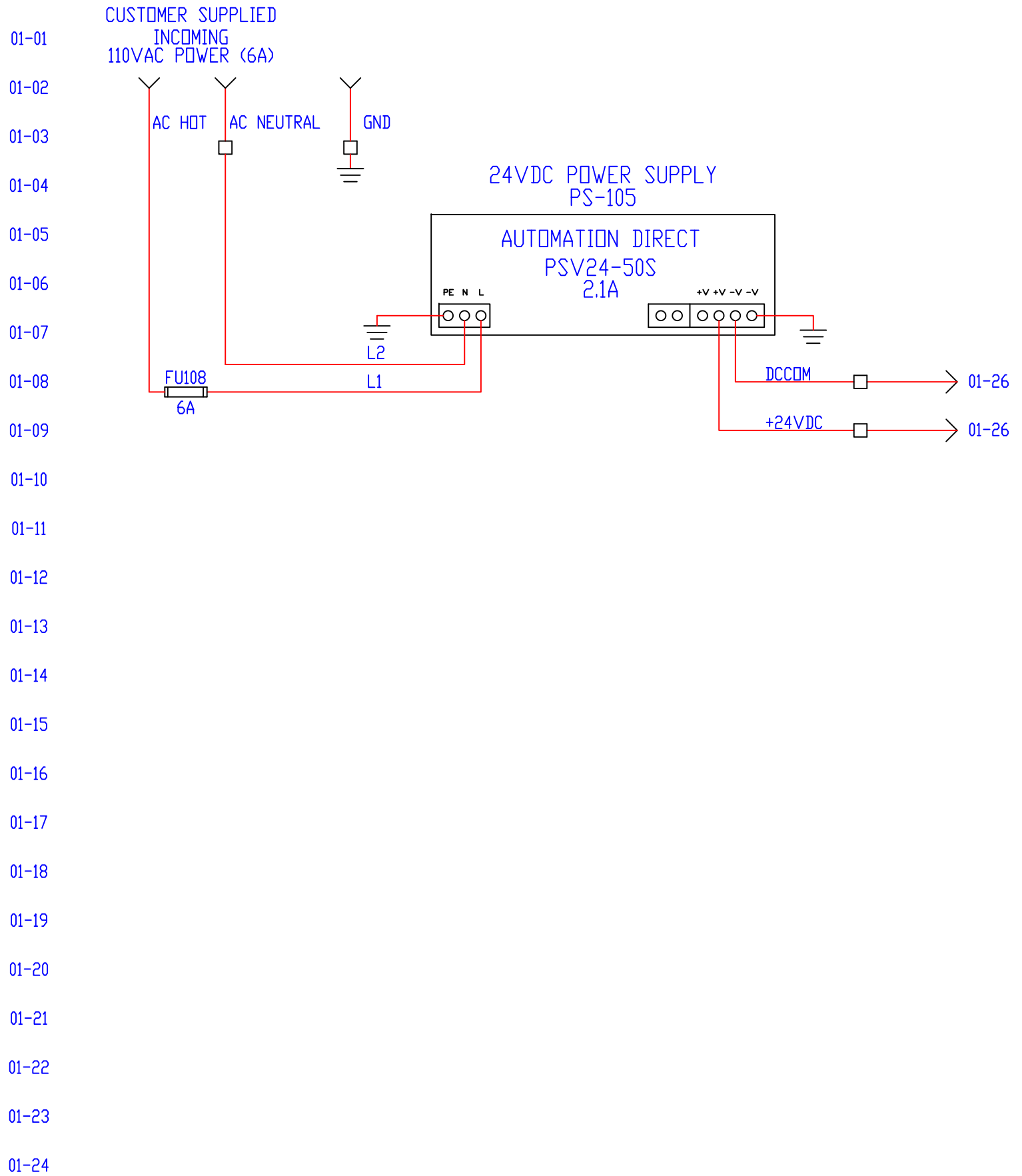
01-01
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01-24

CUSTOMER SUPPLIED
INCOMING
110VAC POWER (6A)

AC HOT   AC NEUTRAL   GND

24VDC POWER SUPPLY
PS-105

AUTOMATION DIRECT
PSV24-50S
2.1A

PE N L

+V +V −V −V

L2

L1

FU108
6A

DCCOM   01-26

+24VDC   01-26

01-25
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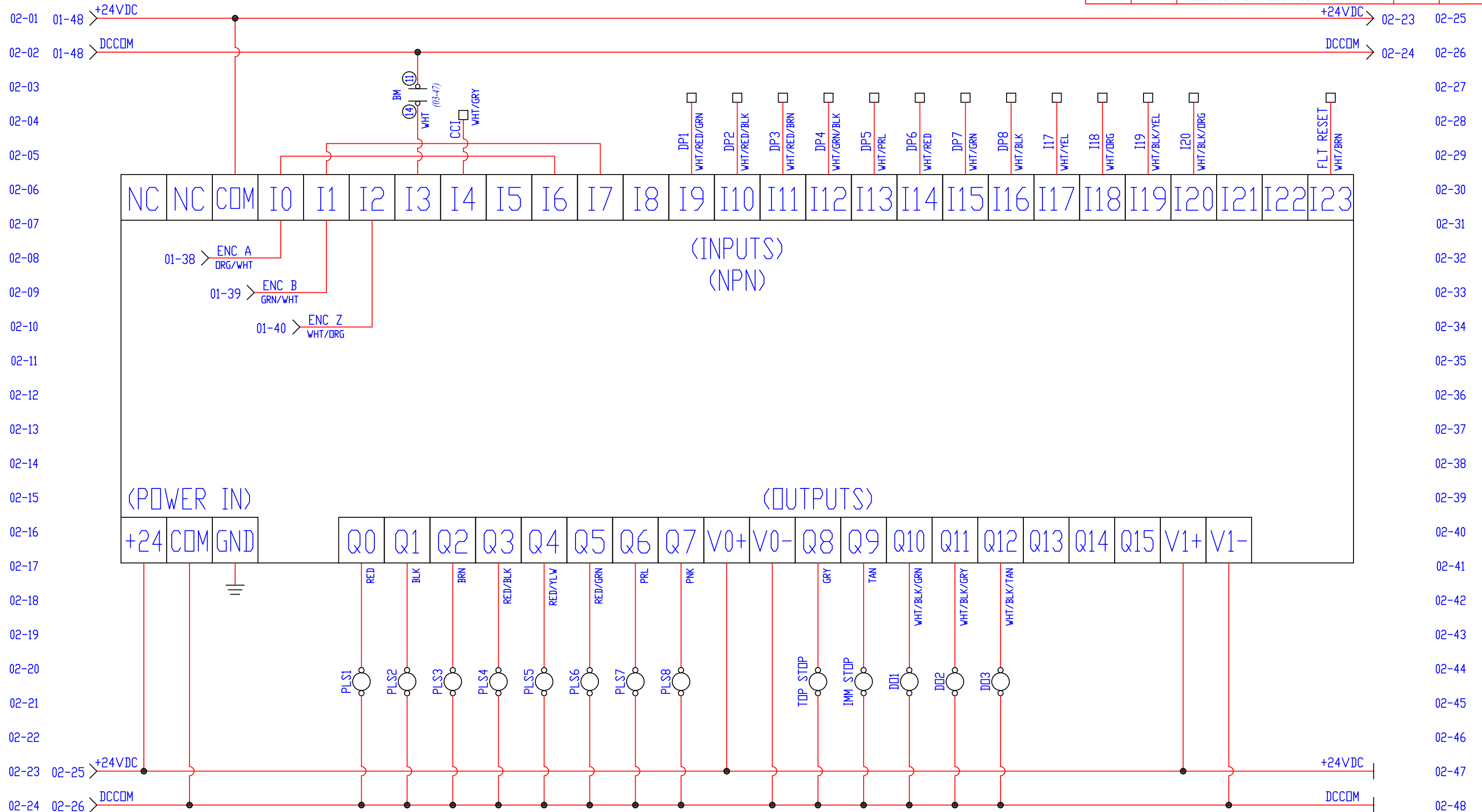01-47
01-48

01-09   +   DC POWER   −   01-08

+24VDC   DCCOM

PRO-FACE
PFXGP4114T2D

BLU/WHT (+)   WHT/BLUE (-)

ORG/WHT (ENC A)   02-08

GRN/WHT (ENC B)   02-09

WHT/ORG (Z PULSE)   02-10

CABLE
TOLEDO INTEGRATED SYSTEMS
P/N PP ENC CAB-050

ENCODER
TOLEDO INTEGRATED SYSTEMS
P/N 1662

+24VDC   DCCOM

02-01   02-02

ALL AC AND DC WIRING MUST BE RUN IN SEPARATE CONDUIT

TOLEDO INTEGRATED SYSTEMS

Designed By: BENJAMIN HOTZ	Date: 6/3/2019	DPPLUS 2.0 POWER DISTRIBUTION
Drawn By: BENJAMIN HOTZ	Date: 6/3/2019	Dwg Index: DPPLUS_2.0 / File Name: Electrical-01.DWG
Modified By: Bob Camp	Date: 10/11/2019	Dwg.Size: B / Dwg.Type: ELEC. / Page 1 of 8 / Doc No: Electrical-01

02-01 01-48 +24VDC ──────────────────────────── +24VDC 02-23 02-25
02-02 01-48 DCCOM ──────────────────────────── DCCOM 02-24 02-26

BM
(11)
(14)
WHT (03-47)
CCI WHT/GRY

(INPUTS)
(NPN)

| NC | NC | COM | I0 | I1 | I2 | I3 | I4 | I5 | I6 | I7 | I8 | I9 | I10 | I11 | I12 | I13 | I14 | I15 | I16 | I17 | I18 | I19 | I20 | I21 | I22 | I23 |

DP1 WHT/RED/GRN
DP2 WHT/RED/BLK
DP3 WHT/RED/BRN
DP4 WHT/GRN/BLK
DP5 WHT/PRL
DP6 WHT/RED
DP7 WHT/GRN
DP8 WHT/BLK
I17 WHT/YEL
I18 WHT/ORG
I19 WHT/BLK/YEL
I20 WHT/BLK/ORG
FLT RESET WHT/BRN

01-38 ENC A ORG/WHT
01-39 ENC B GRN/WHT
01-40 ENC Z WHT/ORG

(POWER IN)

(OUTPUTS)

| +24 | COM | GND | Q0 | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | V0+ | V0- | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 | V1+ | V1- |

RED — PLS1
BLK — PLS2
BRN — PLS3
RED/BLK — PLS4
RED/YLW — PLS5
RED/GRN — PLS6
PRL — PLS7
PNK — PLS8
GRY — TOP STOP
TAN — IMM STOP
WHT/BLK/GRN — DO1
WHT/BLK/GRY — DO2
WHT/BLK/TAN — DO3

02-23 02-25 +24VDC ──────────────────── +24VDC 02-47
02-24 02-26 DCCOM ──────────────────── DCCOM 02-48

02-03 ... 02-22 (left margin)
02-27 ... 02-46 (right margin)

CUSTOMER PRESS CONTROL

DPPLUS

03-01 ... 03-25

TOPSTOP

TOPSTOP — USER TOP STOP CIRC — ⑭ TOP STOP ⑪ — CUSTOMER HOT (CONNECT HOT TO TERM 11 ON RELAY)

IMMEDIATE STOP

IMMEDIATE STOP — USER IMMEDIATE STOP CIRC — ⑭ IMM STOP ⑪ — CUSTOMER HOT (CONNECT HOT TO TERM 11 ON RELAY)

SINK (NPN) SIGNAL
INDICATING IN "INCH"
MODE FROM MODE S.S.

CCI

DCCOM

C1

CLUTCH ENGAGED (110VAC)

Ⓐ1 BM Ⓐ2 N.O. 02-03 — L2

(MUST TURN ON WHEN CLUTCH IS ENGAGED)
(TIS RECOMMENDS USING ONE OF THE CLUTCH WIRES FOR THIS SIGNAL)

PP150 TERMINALS

DPPLUS

04-01
04-02
04-03
04-04   DCCOM [12] ——— DCCOM ——— DC NEUTRAL ——— DCCOM — □ DCCOM
04-05
04-06   TOPSTOP [24] ——— TOPSTOP — USER TOP STOP CIRC — << — << — (14) TOP STOP (11) — □ +24VDC (CONNECT +24VDC TO TERM 11 ON RELAY)
04-07
04-08   IMMEDIATE STOP [26] ——— IMMEDIATE STOP — USER IMMEDIATE STOP CIRC — << — << — (14) IMM STOP (11) — □ +24VDC (CONNECT +24VDC TO TERM 11 ON RELAY)
04-09
04-10   ENC A [31] *ORG/WHT*   *ORG/WHT* — □ ENCA
04-11   JUMPER FOR THESE MUST BE SET IN THE SINK POSITION   USE SHIELDED CABLE
04-12   ENC B [32] *GREEN/WHT* ——— ENCODER ———   *GREEN/WHT* — □ ENCB
04-13   ENC Z [33] *WHT/ORG*   RECOMMEND BELDEN CABLE P/N 8104   *WHT/ORG* — □ ENCZ
04-14   (INCLUDED WITH INTERCONNECT KIT)
                                 (INTERCONNECT KIT TIS P/N PP150/DPPLUS KIT)
                                 (SEE PAGE 5 FOR B.O.M.)
04-15   *SHIELD* — □ GND
04-16   SINK (NPN) SIGNAL
04-17   INDICATING IN "INCH"   — □ CCI
                     MODE FROM MODE S.S.
04-18
04-19   — □ DCCOM
04-20
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04-22
04-23
04-24

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04-48

PP150/DPPLUS KIT B.O.M. (OPTIONAL)
(TIS P/N PP150/DPPLUS KIT)

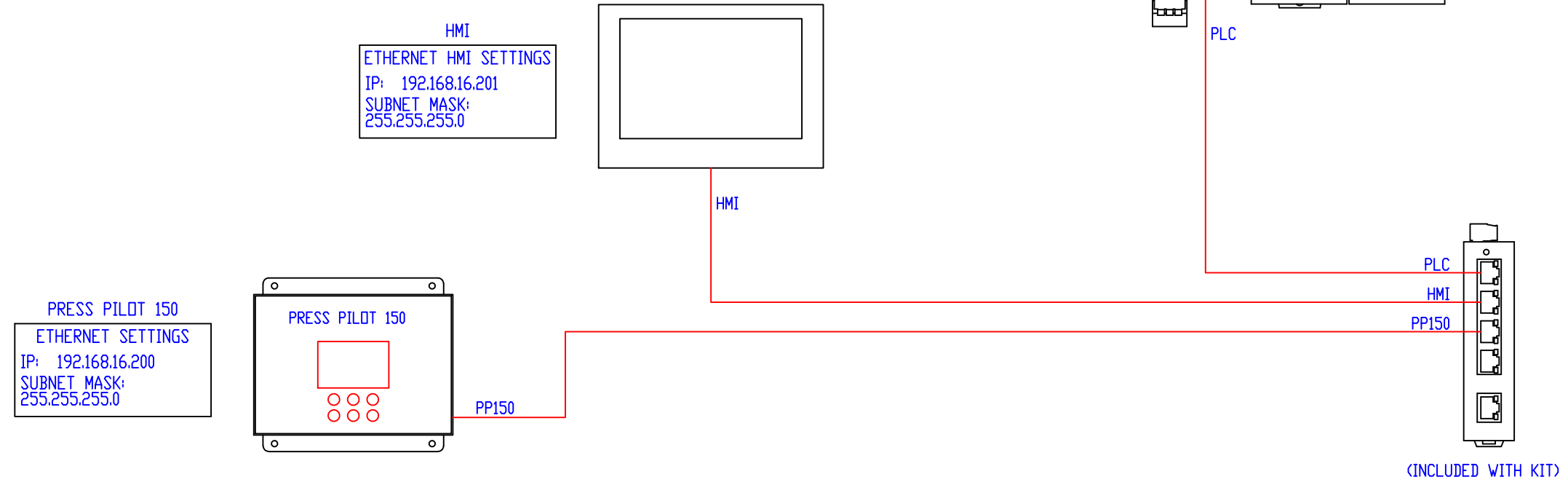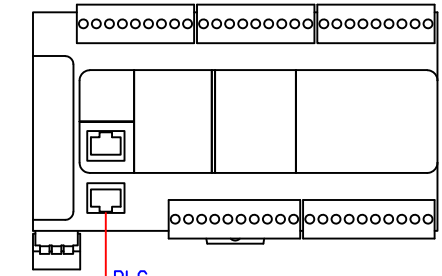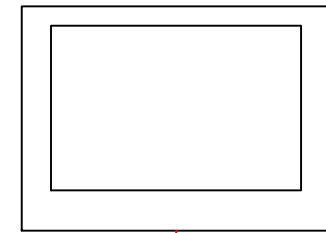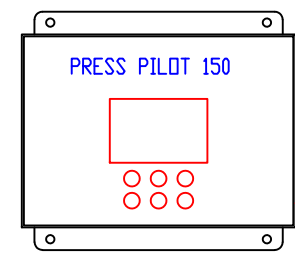| QTY	DESCRIPTION
1	7' CAT5E SHIELDED ENET CABLE
1	1' CAT5E SHIELDED ENET CABLE
10'	ENCODER INTERCONNECT CABLE
1	5 PORT UNMANAGED ETHERNET SWITCH

ETHERNET CABLE PINOUT (STRAIGHT-THROUGH)

RJ45 PIN#	WIRE COLOR	SIGNAL
1	WHITE/ORANGE	TRANSMIT+
2	ORANGE	TRANSMIT-
3	WHITE/GREEN	RECEIVE+
4	BLUE	UNUSED
5	WHITE/BLUE	UNUSED
6	GREEN	RECEIVE-
7	WHITE/BROWN	UNUSED
8	BROWN	UNUSED

87654321

PLC
ETHERNET PLC SETTINGS
IP: 192.168.16.202
SUBNET MASK:
255.255.255.0

PLC

HMI
ETHERNET HMI SETTINGS
IP: 192.168.16.201
SUBNET MASK:
255.255.255.0

HMI

IP ADDRESS	SUBNET MASK	DEVICE	SUPPLIED CABLE LENGTH
192.168.16.200	255.255.255.0	PP150	7' (INCLUDED IN KIT)
192.168.16.201	255.255.255.0	HMI	7' (INCLUDED WITH DPPLUS)
192.168.16.202	255.255.255.0	PLC	1' (INCLUDED WITH KIT)

PRESS PILOT 150
ETHERNET SETTINGS
IP: 192.168.16.200
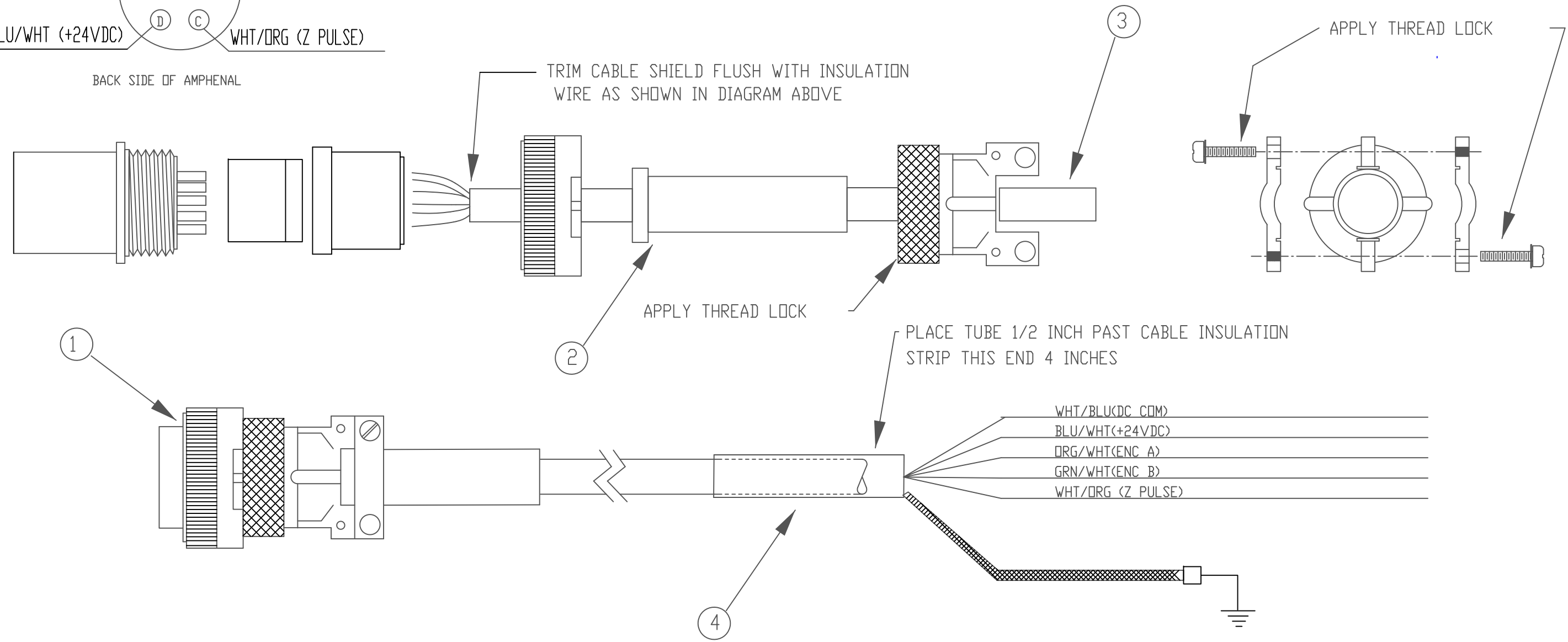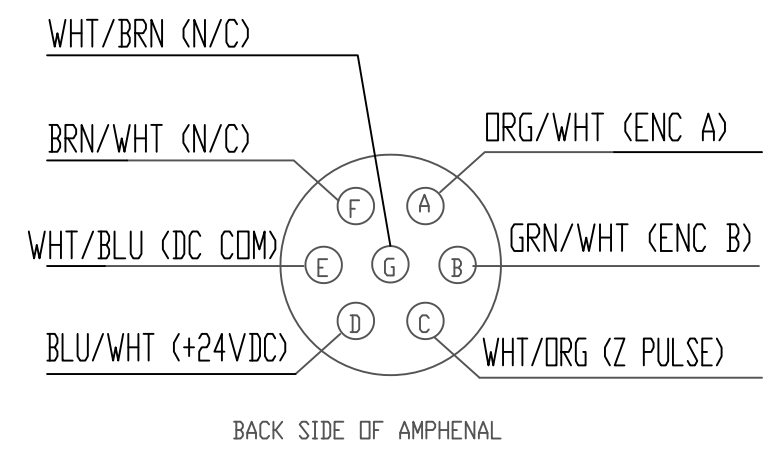SUBNET MASK:
255.255.255.0

PRESS PILOT 150

PP150

PLC
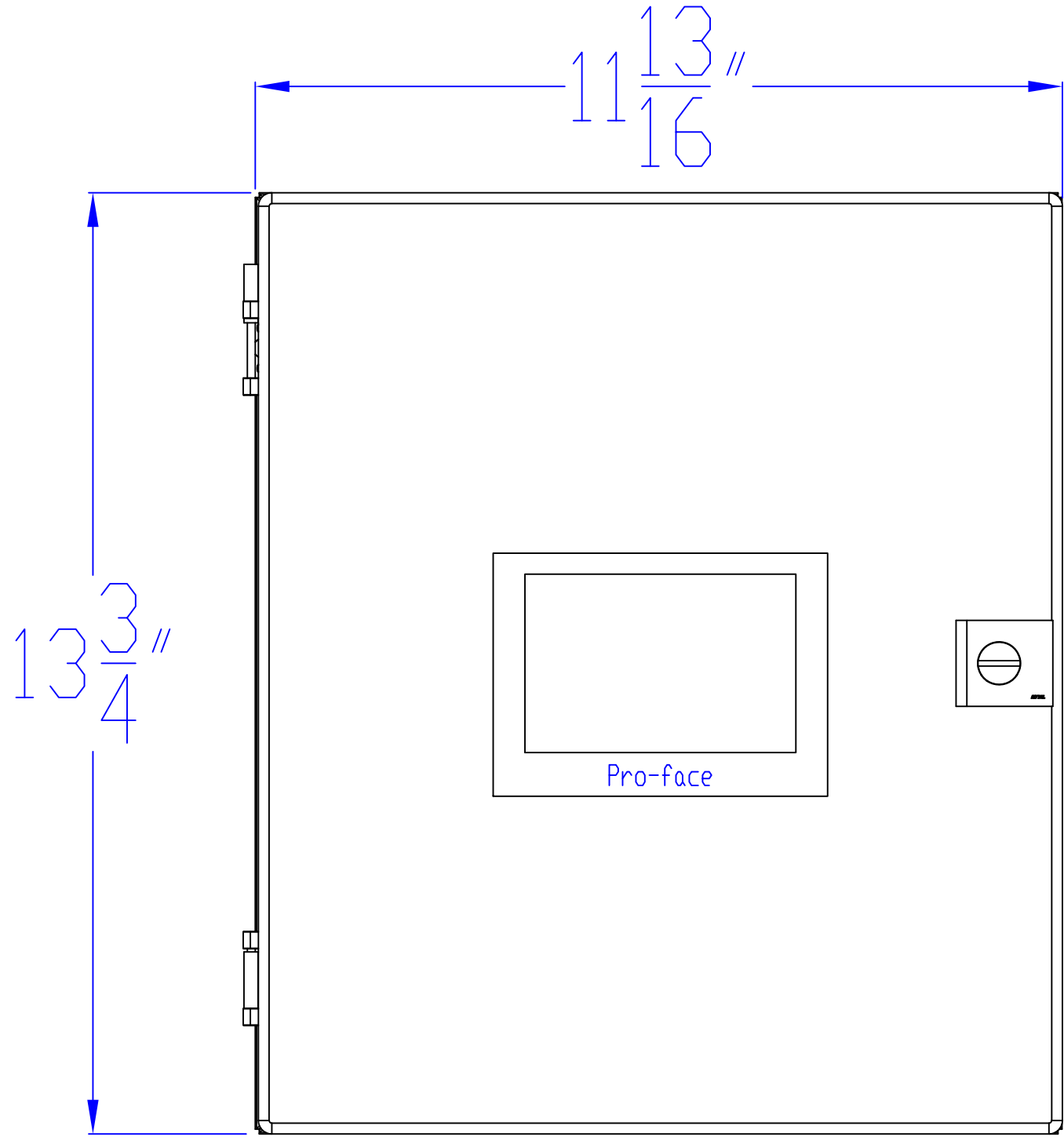HMI
PP150

(INCLUDED WITH KIT)

OBJECTS ON THIS DRAWING NOT DRAWN TO SCALE

ITEM	QTY	TOLEDO PART NUMBER	DESCRIPTION
1	1	0952-266	CON-AMP STR PLUG 7 CIR FE
2	1	0963-266	CON-AMP-RUBBER BUSHING
3	25'	2067-222	BELDEN 8104 SHIELDED CABLE
4	2"	2002-882	TUB-HEAT SHRINK

WHT/BRN (N/C)

BRN/WHT (N/C)

ORG/WHT (ENC A)

WHT/BLU (DC COM)

GRN/WHT (ENC B)

BLU/WHT (+24VDC)

WHT/ORG (Z PULSE)

F A
E G B
D C

BACK SIDE OF AMPHENAL

TRIM CABLE SHIELD FLUSH WITH INSULATION
WIRE AS SHOWN IN DIAGRAM ABOVE

③

APPLY THREAD LOCK

APPLY THREAD LOCK

②

①

PLACE TUBE 1/2 INCH PAST CABLE INSULATION
STRIP THIS END 4 INCHES

WHT/BLU(DC COM)
BLU/WHT(+24VDC)
ORG/WHT(ENC A)
GRN/WHT(ENC B)
WHT/ORG (Z PULSE)

④

$11\frac{13}{16}''$

$13\frac{3}{4}''$

Pro-face

$4\frac{7}{16}''$

$3\frac{1}{16}''$

Screen Cutout

RITTAL ENCLOSURE: JB141206HC

10.83"

13.19"