Wiring Installation Rules

⚠ **IMPORTANT:** Not following Part 1 voids the warranty.

Part 1: Wiring Requirements

- For communication wiring over 200 feet in length, fiber optic cable must be used.
- For communication wiring under 200 feet in length, use only shielded Cat 5 or higher quality industrial cables. Conair part #26715201.
- Never run communication cables parallel to, or tied to power or material conveying lines. Interference can occur from that will disrupt communication between the control and the devices. Avoid static and electrical interference.
- Keep communication lines and device cables separated from all power lines by a distance of at least three feet, except where they enter the control enclosure.
- Do not daisy chain between receivers. Run lines to each receiver individually.
- Do not exceed the cable length recommendations to each receiver.
- Use a dedicated 120VAC power source. After installation, remove the power line plug and wire directly to the power supply. Do not use this power source for any other tools/devices.

Part 2: Best Practices

- Measure all voltages; 115VAC and 24VDC in the FLX and remote at the receivers.
- Make sure the wiring in the FLX box(es) is correct and the wiring to/from the power line filter is isolated from other wiring.
- Make sure the 24VDC and common going to the receiver is from the same box as the I/O signal(s).
- Use solid grounding practices per all local and national electric codes at the FLX-128 Plus control. Make sure all components, including receivers, are properly grounded.
- Ground all shields at only one point. Additional grounding points actually add interference to the line.
- Disconnect all unused Ethernet lines. Open ends can become coated with dust or affected by static, causing interference.
- Keep control panels and cabinets closed when not servicing.

✎ **NOTE:** Failure to follow these rules can result in a system that does not work, or equipment damage.

15 Conductor Cable/Drop Cable -Typical Wire Colors/Connections

The loader drop cable is what connects to the UTB (Universal Terminal Box). The UTB is at the base of the Conair receiver.

The 15 conductor cable is then run to a junction box.

Typically, a 10 conductor cable is used to finish the run to the FLX-128 Plus panel.

TYPICAL WIRE COLORS

Devices		Pumps	
Sensor Power:	Orange	Sensor Power:	Orange
Sensor Common:	Pink	Overload Input:	Blue
Demand Input:	Yellow	Pump Run:	Black
Fill Sensor Input:	Red/Black	Output Common:	White
Output Power:	Red	Ground:	Green
Output Common:	White		
Ground:	Green		
Load Output:	Black		
Ratio Output:	Brown		
Discharge Output:	Red/Yellow		
Purge Output:	Red/Green		

Using the Setup Wizard

The FLX-128 Plus control has a built-in Setup Wizard, which can help you with the wiring process.

1. **Mount the control box in the intended location.**
2. **Thoroughly clean the inside of the box.**
3. **Supply dedicated 115 VAC power to the control box.**
4. **Turn on the control.** The control will power on, and the software will load. Wait for the home screen to appear before pressing any buttons.
5. **Press the touch screen to make sure that the control is ready to use.** The screen will react to your touch.
6. **Press the Setup button.** The Setup screen will appear.

7. **On the Setup screen, press the Advanced Setup button.** The Advanced Setup screen will appear.

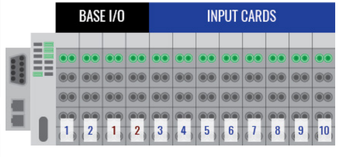
8. **Press the Setup Wizard button.** The Setup Wizard will open.

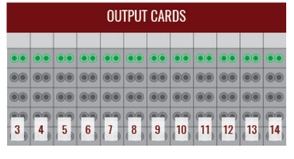
9. **Follow the process step-by-step, as indicated through the Wizard.**

Input and Output Configuration

Input Card 1	1 & 2	Pump overloads		Blue	wire # 100 - 101
Input Card 2	1-8	Demand		Yellow	wires # 110 - 117
Input Card 3	3-10	Pump overloads		Blue	wires # 140 - 147
Input Card 4	9-16	Demand		Yellow	wires # 150 - 157
Input Card 5	17-24	Demand		Yellow	wires # 160 - 167
Input Card 6	25-32	Demand		Yellow	wires # 170 - 177
Input Card 7	1-8	Fill		Gray	wires # 180 - 187
Input Card 8	9-16	Fill		Gray	wires # 190 - 197
Input Card 9	17-24	Fill		Gray	wires # 200 - 207
Input Card 10	25-32	Fill		Gray	wires # 210 - 217

Output Card 1		Pumps 1 & 2 Run		Black	wire # 120 - 121
Output Card 2		1 - 8 Load		Black	wires # 130 - 137
Output Card 3		3 - 10 Pump Run		Black	wires # 220 - 227
Output Card 4		9 - 16 Load		Black	wires # 230 - 237
Output Card 5		17 - 24 Load		Black	wires # 240 - 247
Output Card 6		25 - 32 Load		Black	wires # 250 - 257
Output Card 7		1 - 8 Output	Option 1		wires # 260 - 267
Output Card 8		9 - 16 Output	Option 1		wires # 270 - 277
Output Card 9		17 - 24 Output	Option 1		wires # 280 - 287
Output Card 10		25 - 32 Output	Option 1		wires # 290 - 297
Output Card 11		1 - 8 Output	Option 2		wires # 300 - 307
Output Card 12		9 - 16 Output	Option 2		wires # 310 - 317
Output Card 13		17 - 24 Output	Option 2		wires # 320 - 327
Output Card 14		25 - 32 Output	Option 2		wires # 330 - 337





WIRING AND SETUP
Quick Card | QCC301-1219

FLX-128 Plus
CENTRAL LOADING CONTROL

Connecting a Receiver

✎**NOTE:** DuraLoad™ receiver shown in sample pictures.

Connecting the sequencing valve

The vacuum sequencing valve is located inside the loader lid on the DuraLoad (external to the lid on an Access Receiver). The loader lid wiring contains one black wire and one white wire. The black wire gets landed on the output card. The white wire gets landed on terminal #7.

1-8 load	Black wires #130-137
9-16 load	Black wires #230-237
17-24 load	Black wires #240-247
25-32 load	Black wires #250-257

The 15 conductor cable plugs into the UTB box.

Connecting the demand sensor

The demand sensor uses a yellow wire and an orange wire. The yellow wire is connected to the input card. The orange wire gets landed on terminal #8.

Device 1-8	wires #110-117
Device 9-16	wires #150-157
Device 17-24	wires #160-167
Device 25-32	wires #170-177

The material discharge flapper sends the signal to the control. When the flapper is in the up position, material is needed. When the flapper is in the down position, no material is needed.

Corporate Office: 724.584.5500
Instant Access 24/7 (Parts and Service): 800.458.1960
International: 814.437.6861 | www.conairgroup.com

⚠ **WARNING:** This card provides only basic installation information. Users must be familiar with all safety information and procedures described in the FLX-128 Plus User Guide.

10 Conductor to 15 Conductor Junction Box Wiring

Loader Junction Box (J-Box)			
15 conductor cable	**10 conductor cable**	**Function**	**Connection in PLC**
Orange	Orange	Sensor power	8
Pink	Blue	Sensor common	7
Yellow	Yellow	Demand	110-117, 150-157, 160-167, 170-177
Red/Black	Gray	Fill sensor	180-187, 190-197, 200-207, 210-217
Red	Red	24VDC+	14
White	White	24VDC-	7
Green	Green	Ground	Ground terminal
Black	Black	Load	130-137, 230-237, 240-247, 250-257
Brown	Brown	Ratio valve	260-267, 270-277, 280-287, 290-297
Red/Green	Violet	Purge	300-307, 310-317, 320-327, 330-337
Shield	NA	Static shield - connect at PLC end only.	Ground terminal
Red/Yellow	NA	Air discharge	NA
Blue	NA	NA	NA
Violet	NA	NA	NA
Grey	NA	NA	NA
Tan	NA	NA	NA

✎ **NOTE:** Depending on what receivers and cable you use, these colors may not correspond with your system. In a Conair system, with all Conair components, this color-coding system is followed.

✎ **NOTE:** For more detail reference Conair drawing: DWG 2016_JBOX-STD.

Wire Color Conversions Between Drop Cable and 8 or 10 Conductor Cables

Function	Drop Cable*** Color (pin)	8 conductor cable Color (wire)	10 conductor cable Color (wire)
Sensor power	Orange (11)	Orange (5)	Orange (5)
Demand	Yellow (9)	Yellow (8)	Yellow (8)
Output power	Red (13)	Red (2)	Red (2)
Output common	White (14)	White (3)**	White (3)
Ground	Green (15)	Green (4)	Green (4)
Load	Black (1)	Black (1)	Black (1)
Ratio	Brown (2)	Brown (7)*	Brown (7)
Sensor common	Pink (10)	White (3)**	White (3)
Fill	Red/Black (7)	Blue (6)	Blue (6)
Air Discharge	Red/Yellow (3)	Brown (7)*	Gray (10)
Purge	Red/Green (4)	Brown (7)*	Purple (9)

✎ **NOTES:**

* When 8 conductor cable is used only one Output option will be available.

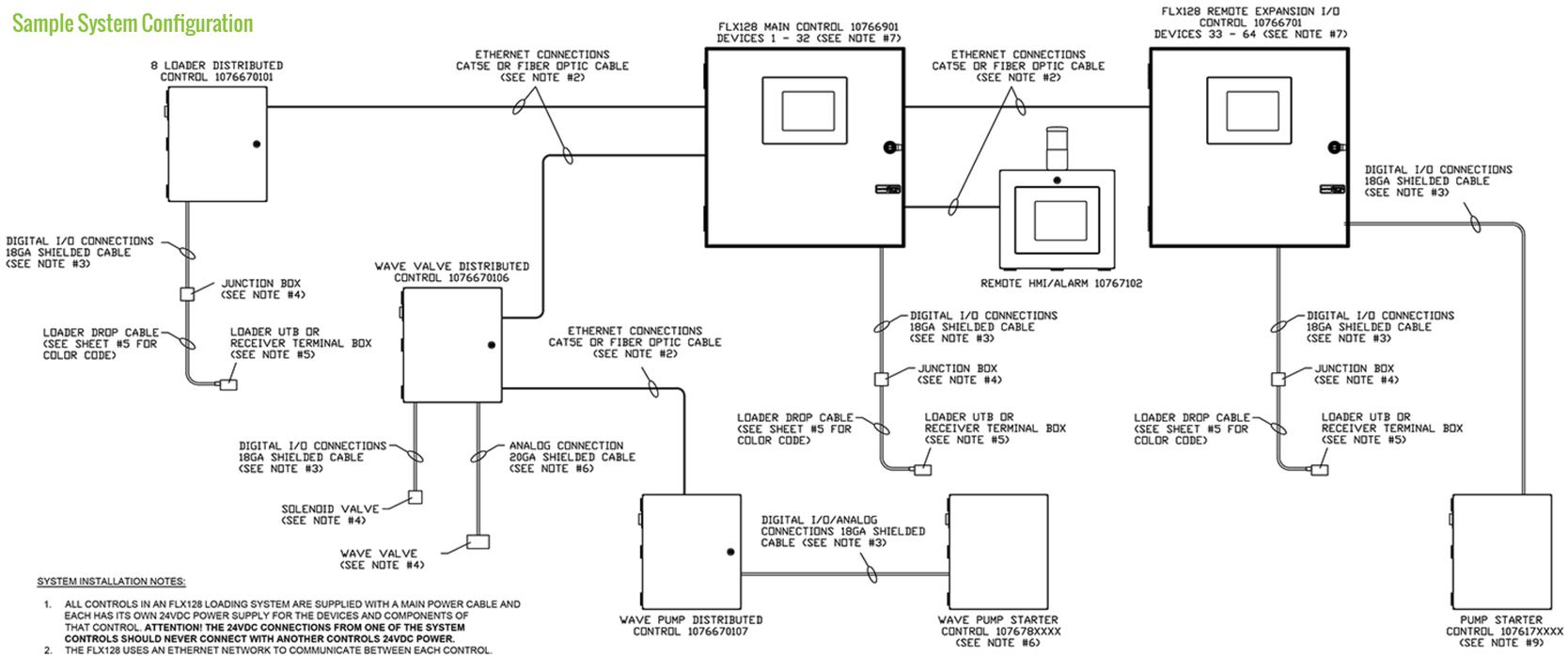
** Output Common & Sensor Common can be combined in junction box for 24VDC application. For multi-voltage applications, you will need to sacrifice an Output Option to separate the commons.

*** Blowback: Blue [5], Alarm: Purple [6], Bin Level: Gray [8] are wired to the pins but not used in Central applications.

Pins 12, 16, 18, & 19 are not wired through but used as discriminator pins for correct output voltage as follows: 24VAC - 12, 16, 18, not 19. 120VAC - 12, 16, 19, not 18. 220VAC - 12, 18, 19, not 16. 24VDC - 16, 18, 19 not 12.

The mating receptacle would only have the missing pin from the Drop cable plug.

Sample System Configuration



SYSTEM INSTALLATION NOTES:

1. ALL CONTROLS IN AN FLX128 LOADING SYSTEM ARE SUPPLIED WITH A MAIN POWER CABLE AND EACH HAS ITS OWN 24VDC POWER SUPPLY FOR THE DEVICES AND COMPONENTS OF THAT CONTROL. **ATTENTION! THE 24VDC CONNECTIONS FROM ONE OF THE SYSTEM CONTROLS SHOULD NEVER CONNECT WITH ANOTHER CONTROLS 24VDC POWER.**
2. THE FLX128 USES AN ETHERNET NETWORK TO COMMUNICATE BETWEEN EACH CONTROL. **ATTENTION! THIS IS THE ONLY CONNECTION BETWEEN SYSTEM CONTROLS! THE TOTAL LINEAR DISTANCE BETWEEN CONTROLS DETERMINES THE TYPE OF CABLE REQUIRED FOR THE NETWORK CONNECTION. ANY LENGTH OVER 200 FT. REQUIRES FIBER OPTIC CABLE. SEE DRAWING 10766101 FOR ETHERNET SWITCH, CABLE, AND CONNECTOR NUMBERS FOR EACH TYPE OF NETWORK CONNECTIONS.**
3. ANY CONTROL IE FLX128 MAIN, REMOTE EXPANSION, OR ANY DISTRIBUTED CONTROL THAT HAS CAPABILITY TO OPERATE A DEVICE (LOADER, VALVE, OR PUMP STARTER) REQUIRES THE OUTPUT SIGNALS TO BE WIRED BACK TO THE SOURCE CONTROL. THAT WIRE MUST BE A MINIMUM OF 18GA. MULTI-CONDUCTOR SHIELDED CABLE. ALL OF THESE CONTROLS WILL ALSO ACCEPT THE INPUT SIGNALS FROM EITHER A SENSOR FOR DEMAND OR FILL AS WELL AS INPUTS FROM PUMP STARTERS TO INDICATE OVERLOAD TRIPS. THESE SIGNALS MUST ALSO BE WIRED BACK TO THE SOURCE CONTROL AND AGAIN THAT WIRE MUST BE A MINIMUM OF 18GA. MULTI-CONDUCTOR SHIELDED CABLE. SEE SHEET #5 FOR WIRING EXAMPLES AND CABLE RECOMMENDATIONS AS WELL AS PART AND MODEL NUMBERS.
4. SOME INSTALLATIONS WILL REQUIRE JUNCTION OR TERMINAL BOXES TO TIE THE LOADER DROP CABLE (107463XXXX) WITH THE MULTI-CONDUCTOR CABLE THAT RUNS BACK TO THE SOURCE CONTROL. SEE SHEET #5 FOR CABLE PART NUMBERS AND COLOR CODES.
5. EACH CONAIR LOADER AND OR RECEIVER HAS EITHER A UTB (UNIVERSAL TERMINAL BOX) OR A TERMINAL ENCLOSURE THAT THE COMPONENTS OF THE LOADER AND ANY OPTIONS CONNECT THROUGH. THIS IS WHAT THE LOADER DROP CABLE (107463XXXX) IS CONNECTED TO THAT CAN BE CONNECTED DIRECTLY TO THE SOURCE CONTROL OR TO A JUNCTION BOX AS DESCRIBED IN THE PREVIOUS NOTE. AGAIN SEE SHEET #5 FOR CABLE PART NUMBERS AND COLOR CODES.
6. SOME INPUTS AND OUTPUTS ARE ANALOG SIGNALS WHICH REQUIRE CABLES THAT THE PART NUMBERS ARE RECOMMENDED IN THE DRAWING SETS FOR ITS CONNECTION.
7. **SYSTEM CAN HAVE A TOTAL OF 128 DEVICES ONLY IF A MAIN CONTROL (DEVICES 1-32), A REMOTE EXPANSION CONTROL (DEVICES 33-64) AND THEN A COMBINATION OF DISTRIBUTED CONTROLS FOR THE TOTAL 128 DEVICES. WITHOUT THE REMOTE EXPANSION CONTROL (DEVICES 33-64) SYSTEM TOTAL CAN ONLY BE 96 DEVICES.**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS: ±1/32
DECIMALS MACHINING: ±0.005
DECIMALS SHEETMETAL: ±0.015
ANGLES: ±1/2 DEG.

SIZE: B | DWN BY: KEC

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