OPERATING INSTRUCTIONS

DIGACOM 2000™ DCX2 DIGITAL PROCESS METER

Introduction

Please read carefully! No liability can be accepted for damage caused by improper use or installation of the DigaCom 2000 Universal Process Display.

DigaCom 2000™ Universal Display is a field mount process display that provides bright, 6-digit LED indication, internal AC/DC power supply, 24VDC for transmitter power, 4-20mA Output, and advanced communications. DigaCom 2000 features digital push button configuration, simple programming interface, RS485 Modbus™ and Ethernet communication. This device is well suited for a variety of process applications.

The DigaCom 2000 is sealed against industrial contamination by a NEMA 4X (IP 65) rated enclosure and is available for either level monitoring, analytical measurements, distance monitoring, pressure monitoring, weight/volume monitoring, and temperature monitoring.

⚠ Safety Precautions

If you are unsure of the suitability of a DigaCom 2000 display for your installation, please consult your FLO-CORP representative or FLO-CORP directly for further information.

Electrical Shock Hazard

It is possible to contact components that carry high voltage, causing serious injury or death. All power to the DigaCom 2000 and (where applicable) the relay circuit it controls should be turned OFF prior to working on the DigaCom 2000. If it is necessary to make adjustments during powered operation, use extreme caution and use only insulated tools. Making terminal block adjustments or installation adjustments to a powered DigaCom 2000 is not recommended by Flow Line Options Corporation.

Flammable or Explosive Applications

FLO-CORP manufactures several different display models with different mounting and internal configurations. It is the user's responsibility to select a controller model that is appropriate for the application, install it properly, perform tests on the installed system, and maintain all components.

ATTENTION

DigaCom 2000 products are compatible with supply voltage of 90-265 VAC or 12-28 VDC. Please respect the polarity of the power terminals as indicated in this user's manual and on the instrument itself. Flow Line Options assumes no responsibility for incorrect wiring of the DigaCom 2000 or any instrument connected to it. DigaCom 2000 Universal Displays are not recommended for life support applications or applications where malfunctioning could result in personal injury or property loss. Anyone using this product for these types of applications should do so at his or her own risk. Flow Line Options Corporation will not be held liable for damages resulting from such improper use.

Disclaimer

The information contained in this document is subject to change without notice. Flow Line Options Corporation makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for a particular purpose.

Incorrect Wiring

Flow Line Options Corporation assumes no responsibility for users incorrectly wiring their DigaCom 2000 (including but not limited to): Supply Voltage, Transmitter Power Supply, 4-20mA Input and Output, 0-5V and 0-10V Input, ModBus™ RS485, and Ethernet connection. Please refer to the wiring diagrams for correct wiring of the DigaCom 2000 Display.

Limited Warranty

Flow Line Options Corporation warrants this product against defects in material or workmanship for the specified period under "Specifications" from the date of shipment from the factory. Flow Line Options Corporation liability under this limited warranty shall not exceed the purchase value, repair, or replacement of the defective unit.
Please see Warranty Section for warranty details.

Registered Trademarks

All trademarks mentioned in this document are the property of Flow Line Options Corporation.

Specifications

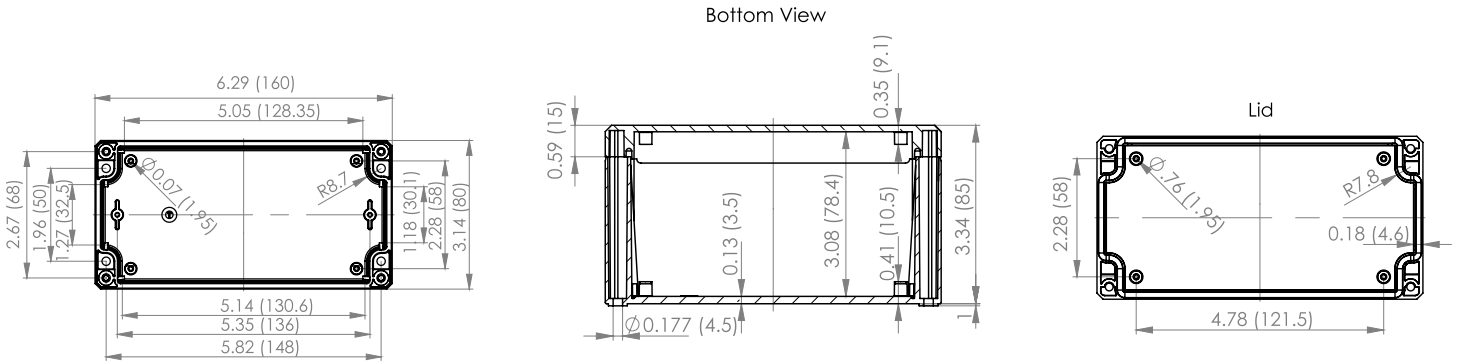|	
Display Type	6-digit, Red LED Display
Display Units	Engineering
Decimal Point	Up to 5 places
Display Output	-99999 to 999999
Display Height	0.6" (15 mm)
Status Indicators	(1) Totalizer, Yellow LED Relay (4) Red LED Relay Indicators
Over Range	Display flashes O-Range when Full value is acheived
User Interface	4 Internal Push Buttons or DigaLink™ PC Software Interface
Password	Programmable, restricts modification of settings
Operating Temperature	F: -40° to 149° C: -40° to 65°
Storage Temperature	F: -40° to 185° C: -40° to 85°
Relative Humidity	0 to 90%, non-condensing
Accuracy	± 0.1% of calibrated span ±1 count
Temperature Drift	0.005% of calibrated span/°C max from 0 to 65°C ambient; 0.01% of calibrated span/°C max from -40 to 0° ambient
Supply Voltage	AC Model: 90-265 VAC @ 50-60 Hz, 15W Max. DC Model: 12-28 VDC @ 0.5A (Fuse protected via 0.5A slow blow)

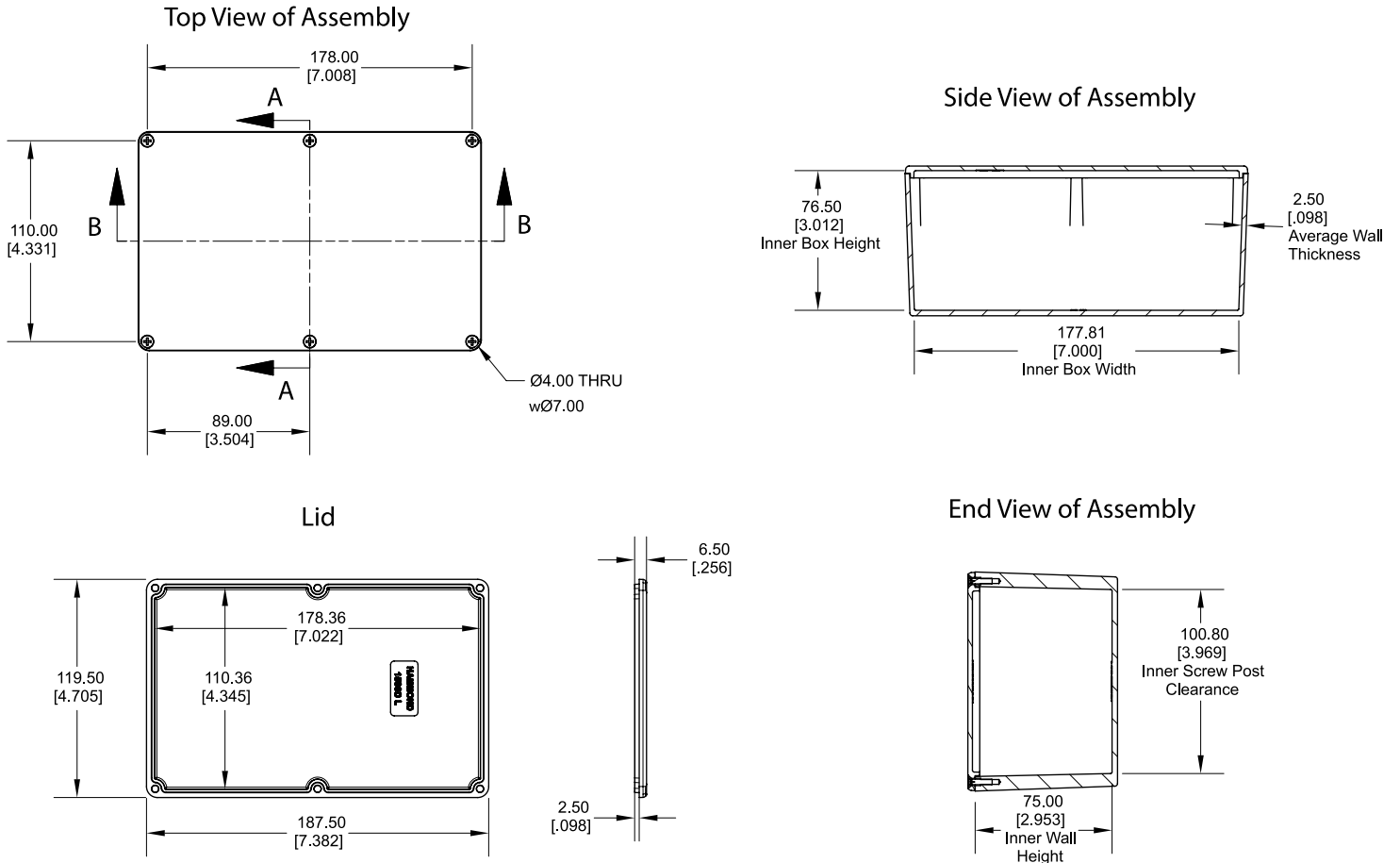|	
Transmitter Power	120 mA @ 24 VDC 24 VDC for AC powered units; For DC powered units, supply voltage equals the DC input voltage
Display Refresh Rate	One Per Second (1/s)
Analog Input	4-20mA current loop
Analog Output	Isolated, scalable 4-20mA
Connection	Removable Screw Terminal; Accepts 12-22 AWG Wire
Enclosure Type	Field Mount
Enclosure Rating	NEMA 4X (IP65), NEMA 7, Aluminum
Enclosure Material	Polycarbonate
Classification	General Purpose
Communications	
Serial Port	RS-485, Screw Terminal ModBus®
Ethernet Port	10/100 Base-T (RJ-45)

Note: Please Consult Factory for Special Requirements

Dimensions

NEMA 4X Enclosure Dimensions

Bottom View

Lid

Epoxy Coated Aluminum Enclosure Dimensions

Top View of Assembly

178.00 [7.008]

A

B   B

110.00 [4.331]

A

89.00 [3.504]

Ø4.00 THRU wØ7.00

Side View of Assembly

76.50 [3.012] Inner Box Height

2.50 [.098] Average Wall Thickness

177.81 [7.000] Inner Box Width

Lid

119.50 [4.705]

178.36 [7.022]

110.36 [4.345]

6.50 [.256]

2.50 [.098]

187.50 [7.382]

End View of Assembly

100.80 [3.969] Inner Screw Post Clearance

75.00 [2.953] Inner Wall Height

Installation and Setup

Unpacking:
Remove the meter from the box and its packing. Inspect the packaging and contents for damage. If damage is noticed, report to the carrier. The DigaCom 2000 is packaged complete, one piece, with instruction manual. If additional copies of this instruction manual is desired it can be downloaded with URL address:

http://www.flowlineoptions.com/download/display/universal_process_displays/dcx2/DCX2_M.pdf

Installation and Setup:

1. Disconnect electrical power from the target system before making or changing any transmitter connections.

2. Remove the meter cover. The base of the meter does not ship with any cable entry holes as manufacture cannot anticipate entry location, size of entry hole to match size of conduit system and so-on. Therefore, it is recommended to remove the DigaCom 2000 electronics board before drilling or punching new entry holes. To remove board, unscrew the (2) phillips head screws, (1) on each side of the board, from the lower housing. Once cable entry holes are complete, re-install board using the (2) philips head screws.

3. Mount the lower housing into place. The lower housing is intended for flat surface mounting like a wall, plate or panel. Install appropriate mounting screws (user supplied) through the four corners of the lower housing. Suggested size 8 or 0.168 diameter, min. 1 inch length.

4. Terminate cable shield connection at earth ground.

5. Make sure if using conduit system that the cable entry is water tight. Any amount of water accumulating in the electronics enclosure will damage the meter.

6. Install DigaCom 2000 meter cover making sure the o-ring seal is properly sealed into the lower housing.

Wiring Diagrams

FLO-CORP assumes no responsibility for users incorrectly wiring their display (including but not limited to): Supply Voltage, Transmitter Power Supply, 4-20mA Input, ModBus RS485, or Ethernet connection. Please refer to the wiring diagrams for correct wiring of the display.
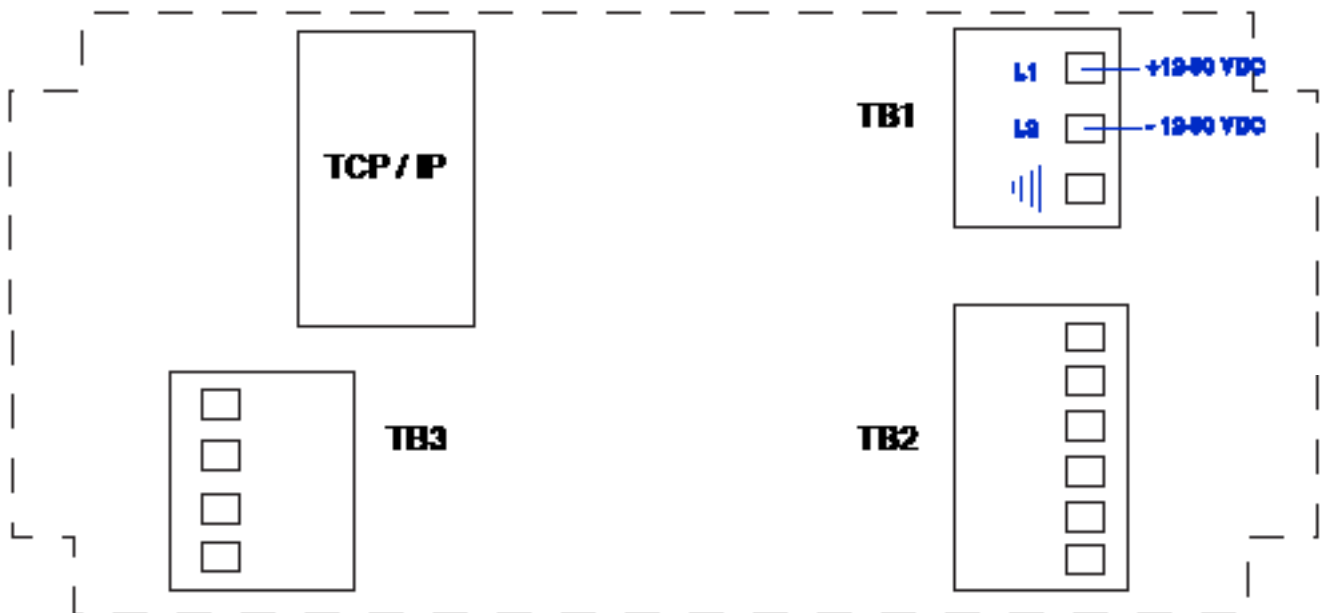
Display can be ordered with 1 of 2 power connection options. The AC power option will only work when connected to a 90 to 265 VAC, min. 0.5 amp power circuit. AC mains must be connected as illustrated below with ground terminal.

The DC power option will only work when connected to a 12 to 28 VDC, min. 0.5 amp power circuit. DC mains must be connected as illustrated below.
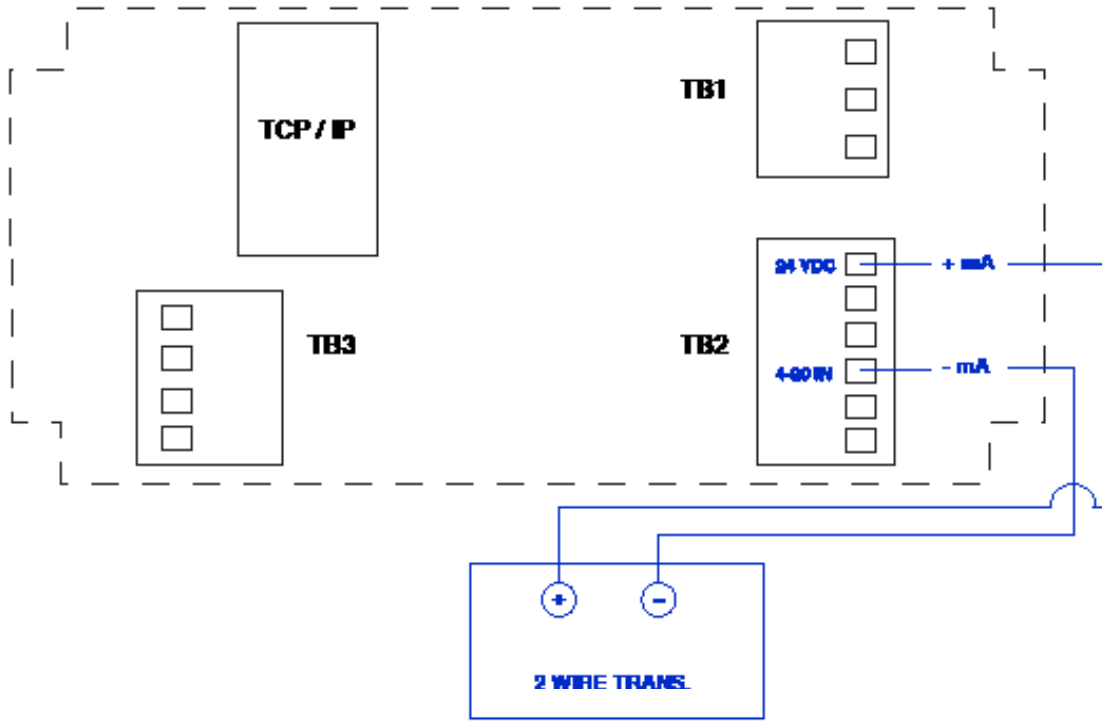
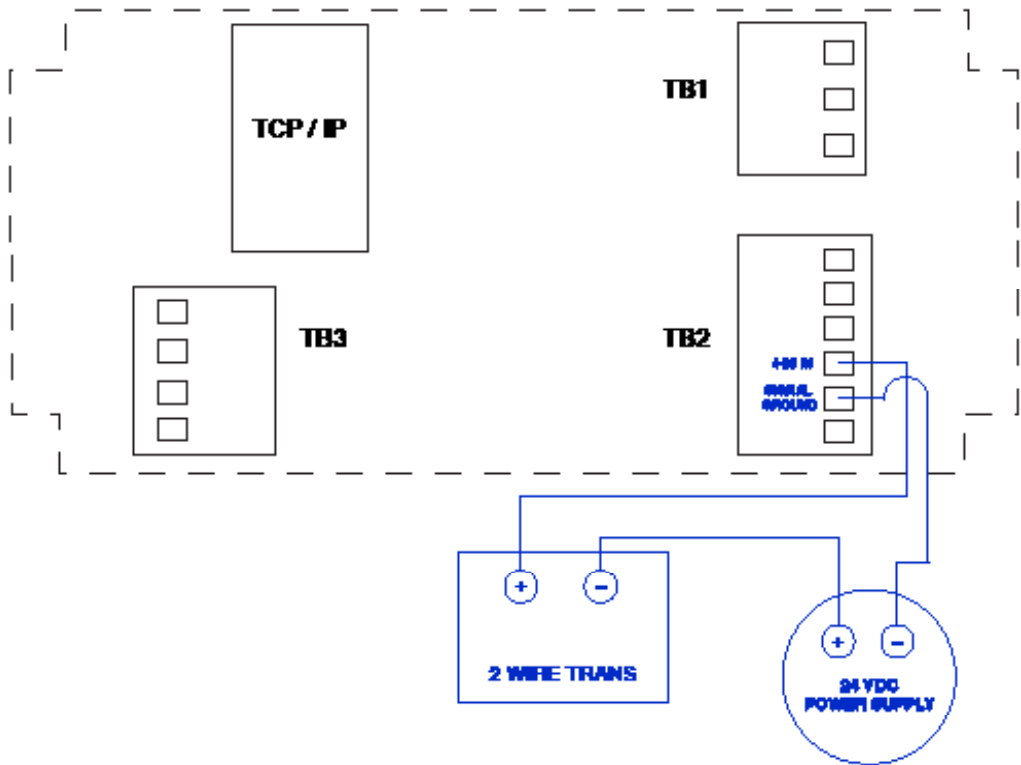**AC Power Option 90-265 VAC 50/60 Hz**

TCP / IP

TB1
L1 — 90-265 VAC
L2 — Neutral

TB3

TB2
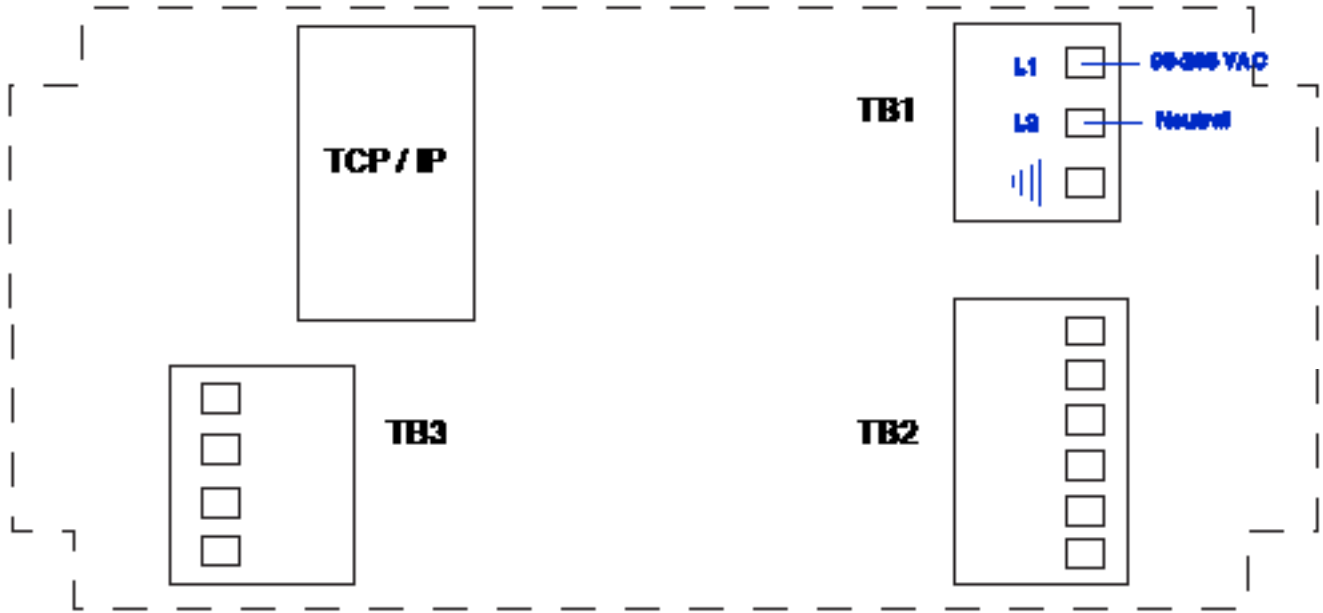
DC Power Option 12-28 VDC +/- 10%, 15W

TCP / IP

TB1
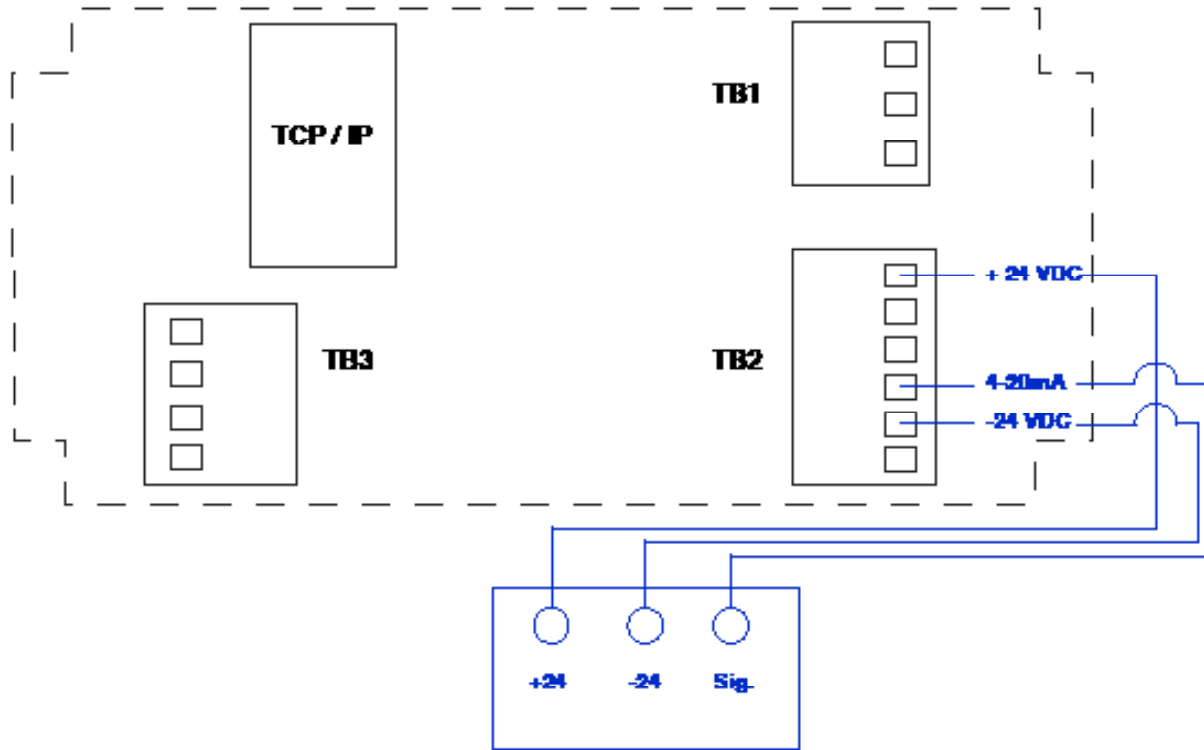L1 — +12-50 VDC
L2 — -12-50 VDC

TB3

TB2

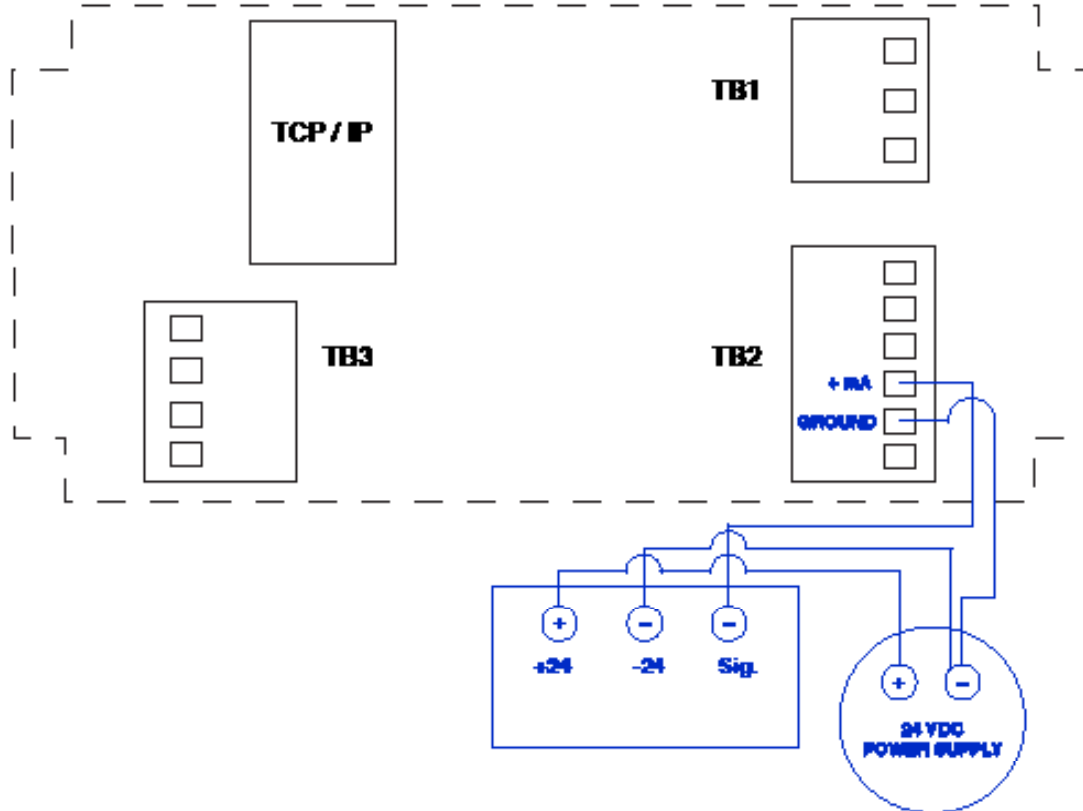**Two-Wire 4-20mA Input - Internal Power**

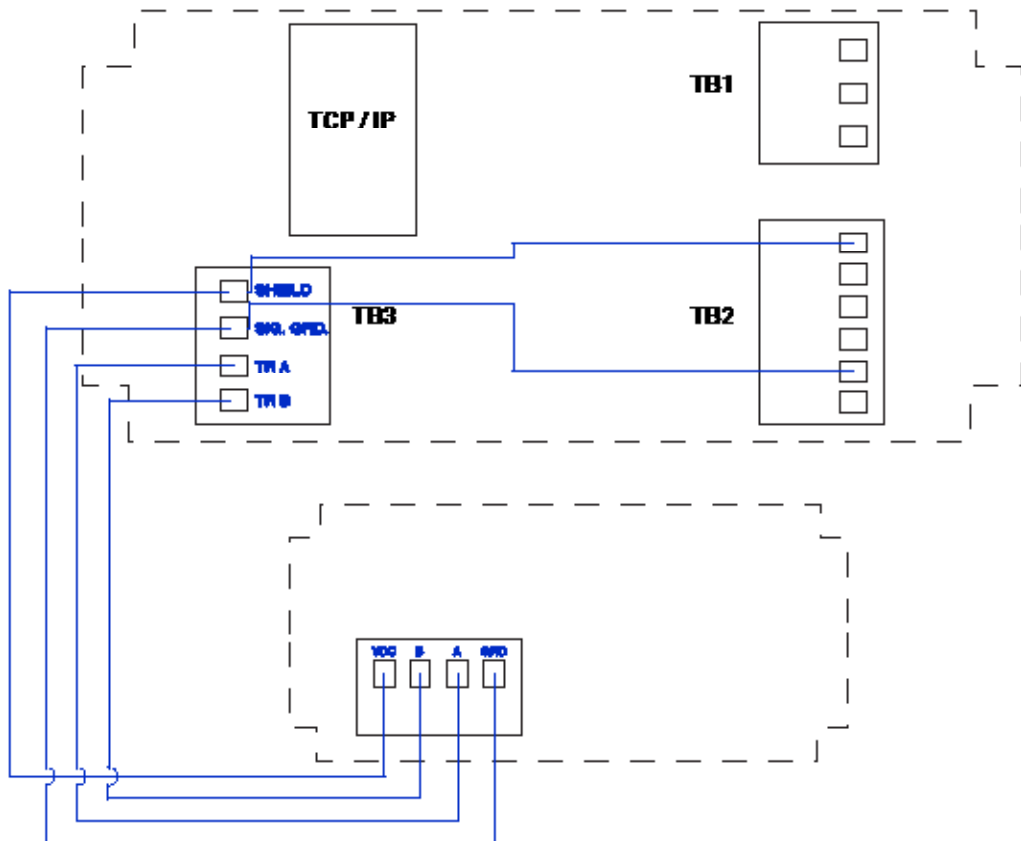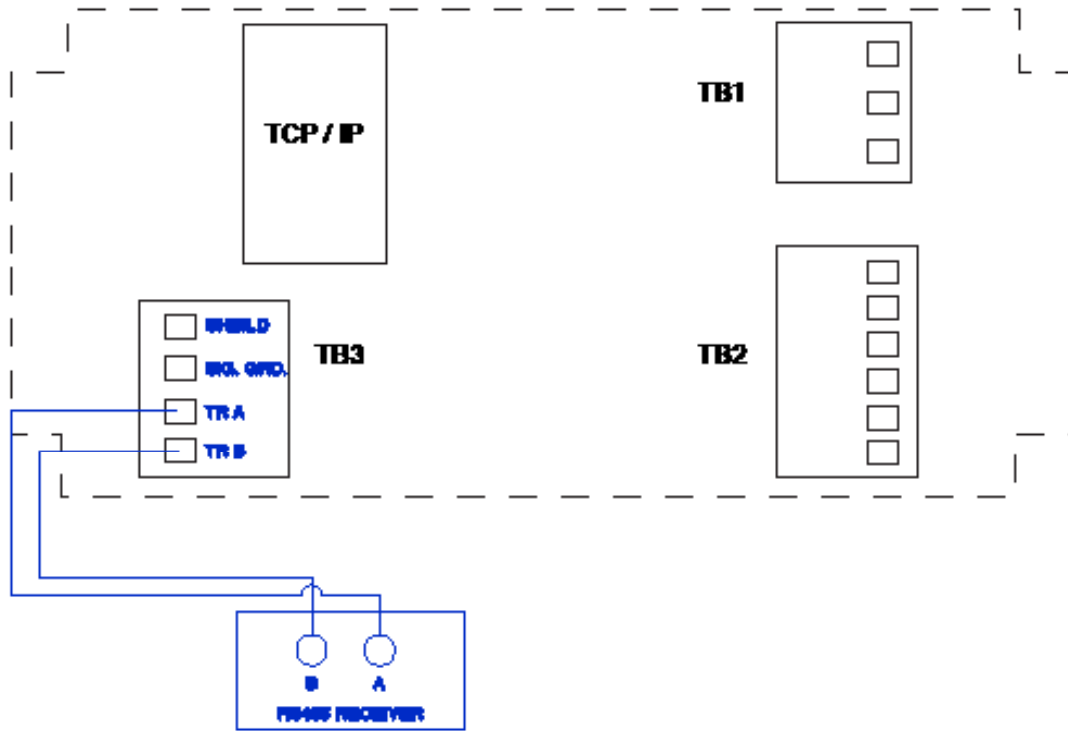**Two-Wire 4-20mA Input - External Power**

Three Wire 4-20mA Input-Interal Power

Three Wire 4-20mA Input-External Power

RS485 Connections - Serial communications is made by wired terminal connections. The same terminal (TB3) is used for interfacing with the eXmod relay module, RS-485 USB modem and any host or slave RS485 communications device.
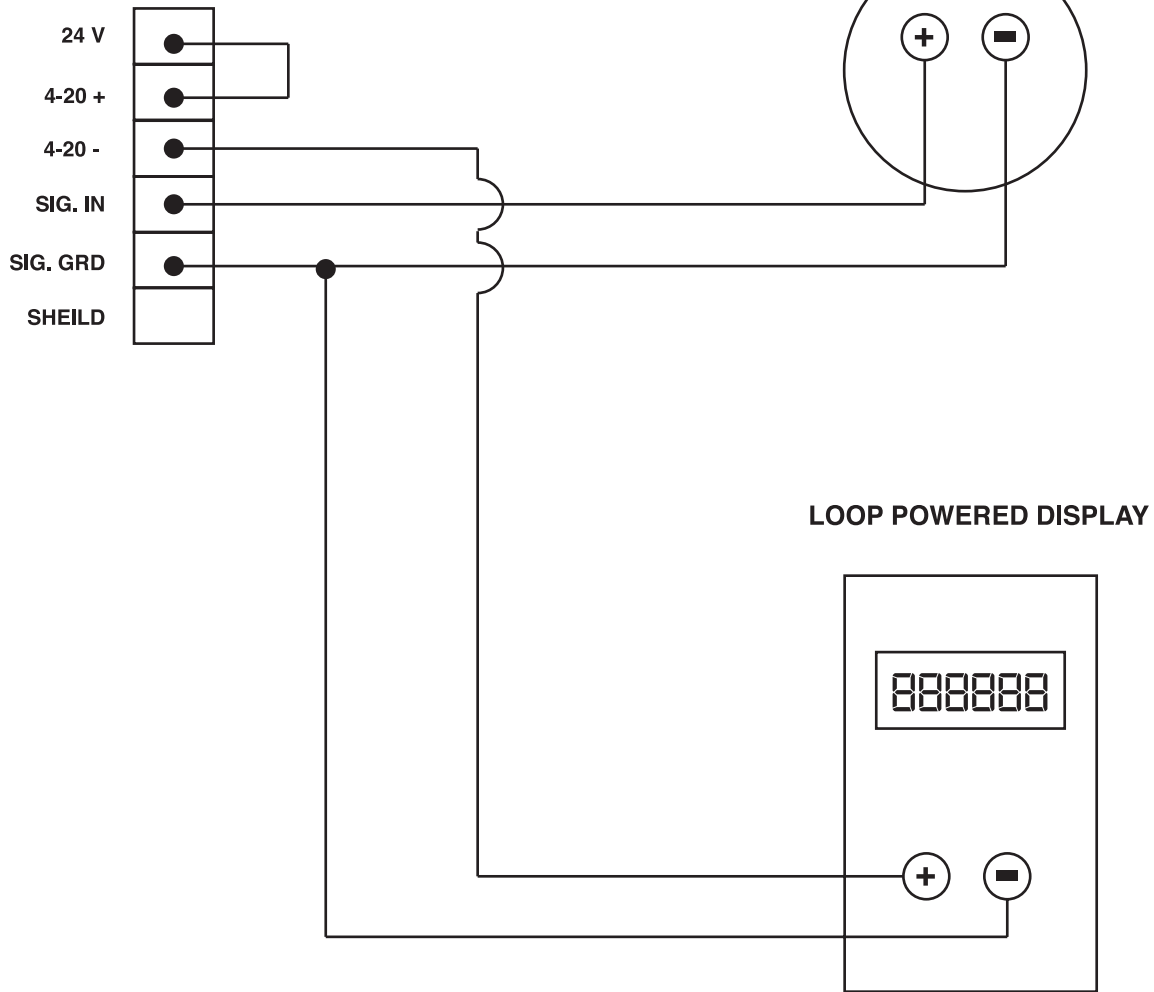
WIRING EXAMPLES

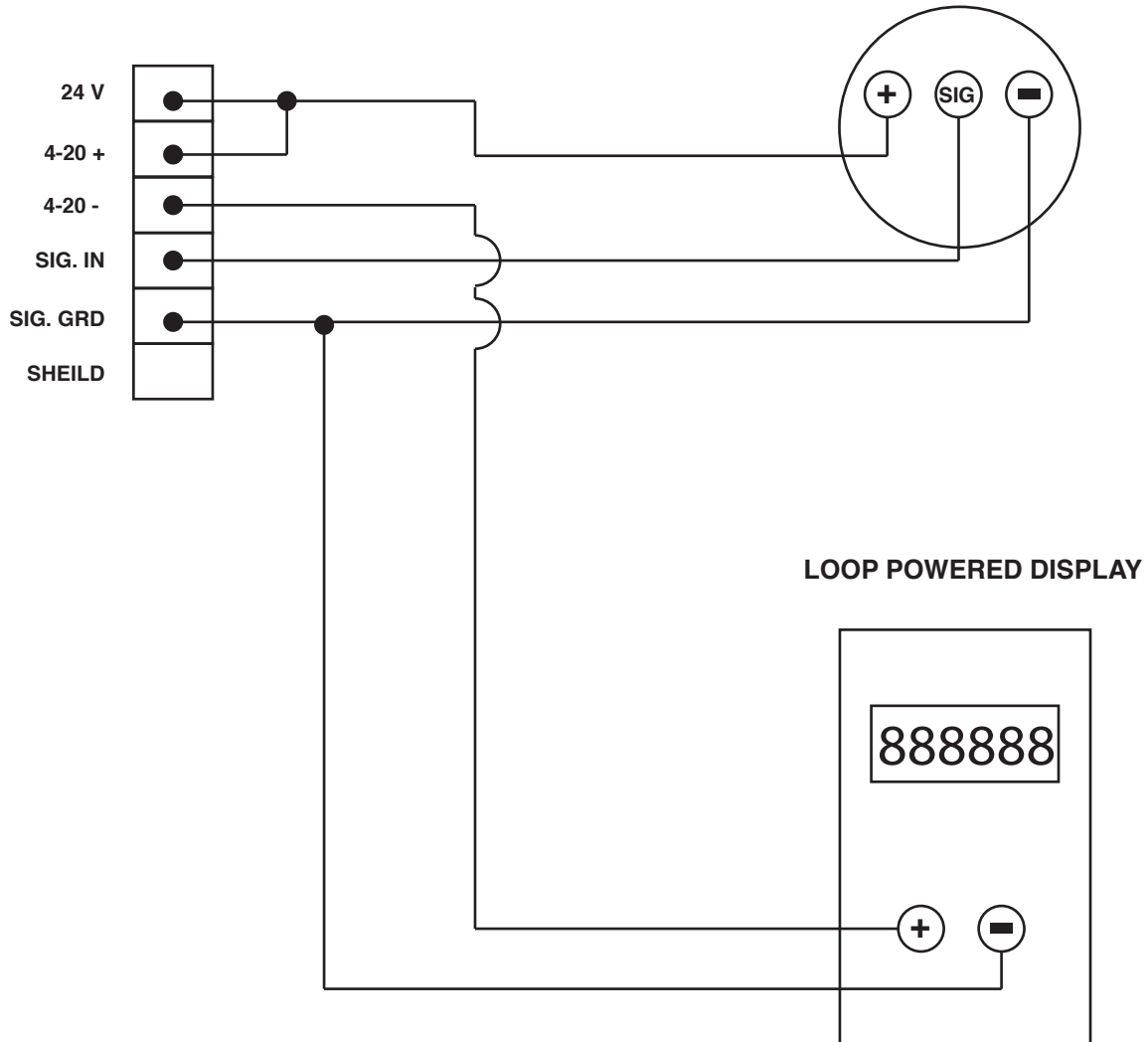## mA Input & Output Wiring Example

DIGACOM 2000 LEVEL MONITOR

2-WIRE TRANSMITTER

24 V

4-20 +

4-20 -

SIG. IN

SIG. GRD

SHEILD

LOOP POWERED DISPLAY

888888

DIGACOM 2000 mA INPUT & OUTPUT WIRING EXAMPLES

DIGACOM 2000 LEVEL MONITOR

3-WIRE TRANSMITTER

24 V

4-20 +

4-20 -

SIG. IN

SIG. GRD

SHEILD

+ SIG −

LOOP POWERED DISPLAY

888888

+ −

mA Input & Output Wiring Example

RECORDER OR PLC

mA Input - Souorcing from Recorder or PLC

DIGACOM 2000 LEVEL MONITOR

2-WIRE TRANSMITTER

24 V

4-20 +

4-20 -

SIG. IN

SIG. GRD

SHEILD
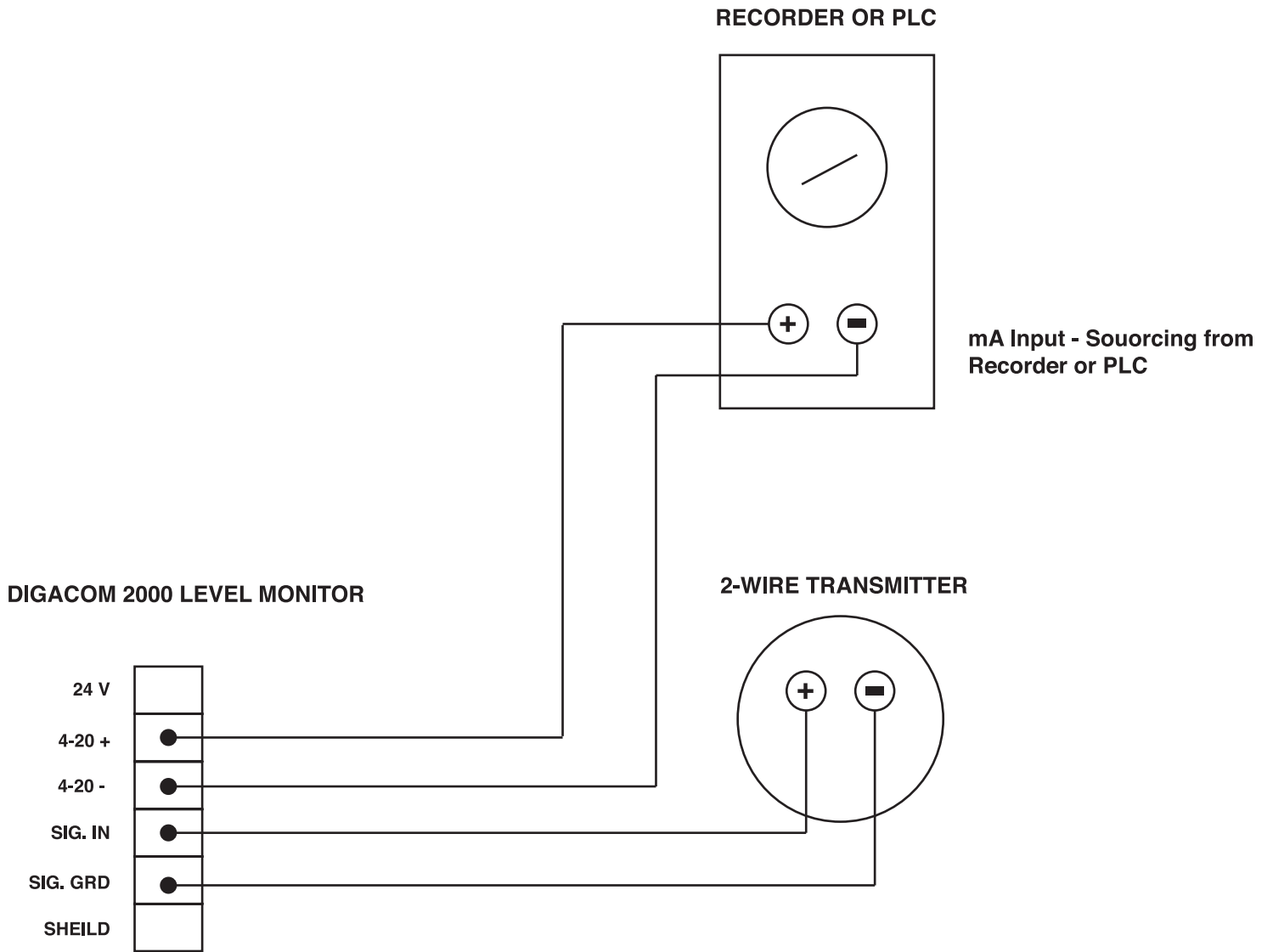
DigaCom 2000™ with Tracer 1000™ 2G Wiring Example

115 AC

DIGACOM 2000™ PROCESS DISPLAY

1 2 3 4 5 6 7 8

**TRACER 1000™ 2G
GWR LEVEL TRANSMITTER**

+24

mA
in

GRD

TRA   **TRB**

RS-485
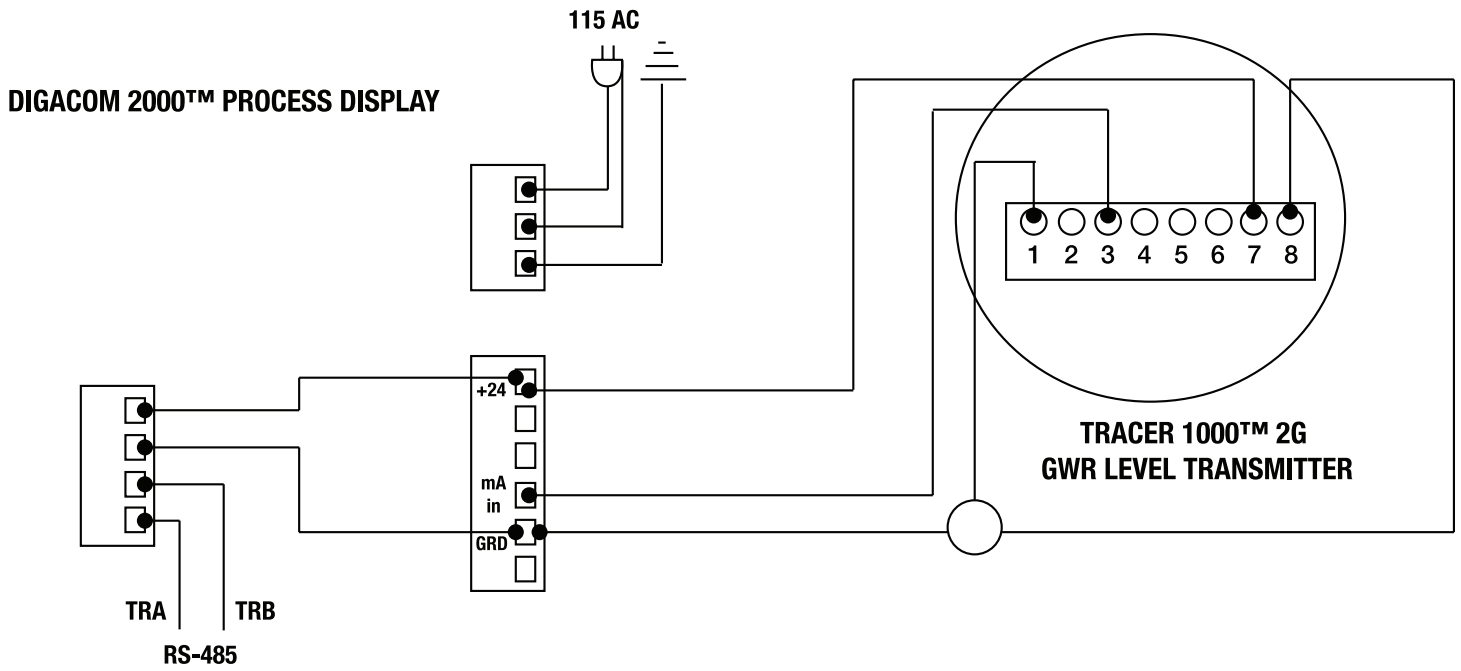
Programming and Calibration

Remove the display cover by unscrewing the 4 Phillips Head Screws located at each of the four corners to reveal the 4 internal push buttons located on the CPU board (bottom board). The buttons from left to right are functions:
Menu - From the Run mode pressing enters the Menu mode. If in the Menu mode when pressed will escape from the Menu mode and enter into the Run mode.
UP - Advances Up through the Menu mode or Up through value (depending on position in the programing mode.)
DOWN - Advances Down through the Menu mode or Down through value (depending on position in the programing mode.)
ENTER - Enters into the Programing functions and Programing Values. Once functions and/or values are entered in, the program auto advances to next function. To quite programing, push the MENU button twice, display will read STORE and automatically advance to the Run mode.

Programming of Relays

Configuration of the relays will activate the relays LED located above the 6 digit, 7 segment display screen. When the relay set point has been reached or exceeded, the LED will light acknowledging the relay activation. The LED will extinguish once the relay has returned to its normal state. The relays are mounted in the eXmod™ relay module and is connected by the RS485 communication terminal (TB3) located on the lower left hand corner of the display CPU board. For additional information on the eXmod relay module, please refer to the eXmod data sheet.

1. Press: Menu
    1.1   Display will read: rELAy

2. Press: Enter
    2.1   Display will read: rELAy1 - If relay #1 is the relay to be configured, press enter. Other wise press the DOWN button to advance to relay # 2 and so on.

3. Press: Enter
    3.1   Display will read: Act - The actuation of the relay should be selected.

4. Press: Enter
    4.1   Display will read: OFF - This is the factory default. The relay is turned off and relay display LED will not illuminate and relay will not actuate until relay is turned to one of five actuation options.

5. Press: Enter
    5.1   Display will read: AtorSt -   This is how the relay should act: choose between AtorST Auto Reset - The relay will automatically change back to normal state once the set point is NOT exceeded. Press enter to choose Auto Reset or Down to select ManrSt (Manual Reset - this is a non-latching relay action that when the set point is reached, the relay will trip and stay tripped until the reset push button has been actuated either locally or remotely (DigaLink) regardless if the process value is normal or has been reached or exceeded the set point value. The LED is always off unless the set point value has been reached or exceeded.   The LED will stay on until the set point has been manually reset. Press enter to choose Manual Reset or Down to select LtchCL. Latching with Clear is a latching relay action that when the set point is reached, the relay will trip and stay tripod until the reset push button has been actuated. Manually resetting the relay will not occur if the process value is at or exceeded the set point value. The relay can only be reset after the alarm condition has cleared. The LED is always off unless the set point value has been reached or exceeded. The LED will stay on until the alarm condition has cleared and the reset button has been pushed. Press enter to select Latching with Clear or down to select ALtnAt. Pump Alternation: For pump control applications where two or more similar pumps are used to control the level of a tank or a sump, it is desirable to have all the pumps operate alternately to prevent excessive wear on the pumps.

Example of pump alternation operation:

Relay (pump 1) #1 is programmed to turn on when level reaches 50.00, when level drops below 10.00 relay (pump 1) #1 turns off.

The next time level reaches 50.00 relay #2 (pump 2) turns on, when level drops below 10.00 relay #2 (pump 2) turns off.

This is how the relay set points will be programmed: Relay # 1 set point on = 50.00   off = 10.00
Relay # 2 set point on = 55.00   off = 5.00

If pump #1 cannot keep the level below 55.00 pump # 2 will turn on at 55.00, then as the level drops to 10.00 pump #1 will turn off, pump # 2 will not turn off until level drops below 5.00

The next time level reaches 50.00 relay #2 (pump 2) turns on, when level exceeds 55.00 relay #1 (pump 1) will turn on until level drops below 10.00, then relay # 2 will turn off and relay # 1 will turn off when level drops below 5.00 - alternately

        Press enter to select Pump Alternation or press down to select rAttot. Rate or Total allows you to select if you choose to program the relay to actuate on the rate value or the total value. Select Rate if you want the relay to actuate on a level application or flow rate limit application or any application when a rate will be exceeded. Select Total if you would like the relay to act as a batch controller. By programming total limits you can turn a pump on/off at defined Batch Amounts or Volume.

6. Press: Enter
    6.1 Display will read: FLSAFE - Fail Safe is the state you want the relay in if the power is lost to the control system.

7. Press Enter
    7.1 Display will read: OFF - With fail safe off the relay will change to its normally open when no power is applied.

8. Press: Enter
    8.1 Display will read: Relay # (Relay 1 or Relay 2 etc.) ON - Press enter to enter in the programmed value that the relay should turn on. OR - Press down to program the relay off value.

9. Press: Enter
    9.1 Display will read: The next relay number after the relay that was just programmed. Follow the instructions above for each of the four relays.

Once the selected relays have been programmed to satisfaction, press the MENU button to go back to the main menu selection in the programming mode. The display should read RELAY. By pressing the DOWN button you can advance to the ConFig (Configuration) menu. Press Enter to continue.

Note 1.: When communicating to the eXmod relay module, program the RS-485 to the relay setting. See programming instructions Programming RS-485 section on page 9.

Configuration of Display
The display can be configured to display Rate, Total, or both Rate and Total. To configure these settings follow the instruction set below.

1. Press: Menu
    1.1 Display will read: ConFig (Configure)

2. Press: Enter
    2.1 Display will read: diSPLA (Display)

3. Press: Enter
   3.1 Display will read: rATE (Rate)

4. Press: Enter to select Rate to display or Press: Down to scroll between: Rate, Total, or Both (Both Rate and Total to display).

5. Once desired Display setting is indicated Press: Enter
   5.1 Display will read: totUnt (Total Units)

6. Press: Enter
   6.1 Display will read: dAy - Press enter to select the DAY unit or press Down to select Hour or press Down to select Min (Minute) or press Down to select SEC (Seconds)

7. Press: Enter
   7.1 Display will read: 9-tot (Grand Total) - The DigaCom 2000 can display a grand total which is an accumulated total in addition to the standard totalizer in step number 4.

8. Press: Enter
   8.1 Display will read: 9t OFF - Press enter to turn the Grand Total off or press down button to turn the Grand Total on. If Grand Total is selected, CLr 9t (Clear Grand Total) will be displayed.
   8.2 Press Enter: Display will read no for not clearing Grand Total data. Press Down button: Display will read yES Press Enter to clear Grand Total data.

9. Press: Enter
   9.1 Display will read: CUTOFF - Low Flow Cutoff is used for flow applications mostly. Most flow meters reach a flow rate at the very bottom of their flow range that is very unstable. CUTOFF provides a numeric value that can be programmed in to cut this unstable reading out so the display will read 0.00.
   • Press Enter - The Display will read 00000.0 - Press the numeric value in at the point of low cut off. If 0.0 is desired.

10. Press Enter:
    10.1 Display will read: FACtor -(Exponential Factor) - The display can be configured with a Totalizer Multiplier of 1, 10, 100, 1000 or .01 and .1. To implement a Totalizer Multiplier follow the instruction set below. Example: If user would like the display value of 100 on the rate display equal the count of 100 on the totalizer, enter in Totalizer Multiplier of 1. If user would like the display of 100 on the rate display to equal the count of 10 on the totalizer, enter in Totalizer Multiplier of 10.

11. Press Enter: Display will read ConFig.

12. Press: Menu to exit Configuration and enter Run mode OR Press Down button to advance to the Scale section of the program menu.

Totalizer Reset
To reset the Totalizer on the display follow the instruction set below.

1. While in Run Mode: Simultaneously Press: both Menu and Enter at the same time
   1.1 Display will read: t-rSEt (Totalizer Reset)

2. The Totalizer is now reset

Reset of the Grand Totalizer
To reset the Grand Totalizer follow the instruction set below.

1. Press: Menu
   1.1 Display will read: ConFig (Configure)

2. Press: Enter
   2.1 Display will read: diSPLA (Display)

3. Press: Down
   3.1 Display will read: g-tot (Grand Total)

4. Press: Down
   4.1 Display will read: CLr gt (Clear Grand Total)

5. Press: Enter
   5.1 Display will read: no

6. Press: Up
   6.1 Display will read: YES

7. Press: Enter
   7.1 Display will read: FACtor (Exponential Factor)

8. Press: Menu to exit Reset Grand Total Menu
   8.1 Display will read: Config (Configure)

9. Press: Menu to exit Configuration Menu and enter into Run mode.

Programming SCALE Settings
The display can be programmed so the 4-20 mA signal will equal a desired engineering unit. To Scale the display follow the instruction set below.

1. Press: Menu
   1.1 Display will read: Relay

2. Press: Down
   2.1 Display will read: ConFig

3. Press: Down
   3.1 Display will read: SCALE

4. Press: Enter
   4.1 Display will read: dEc Pt (Decimal Point)

5. Press: Enter
   5.1 Display will read: 000000
   5.2 Decimal point can be programed using the Up or Down buttons to read up to 5 full numbers to the right of the decimal point. example: 0.00000

6. Press: Enter
   6.1 Display will read n-PntS (Number of Linearization Points - 16 maximum)

7. Press: Enter
   7.1 Display will read: 02

8. Press: Up to adjust the first numerals value

9. Press: Down to scroll to the next numeral

10. Press: Enter once desired number of points is indicated
    10.1 Display will read: InPt 1

11. Press: Enter
    11.1 Display will read: 4.00 (4mA)

12. Press: Down to scroll to the desired numeral that needs adjusted

13. Press: Up to adjust the numerals value

14. Press: Enter once desired low input analog signal is indicated
    14.1 Display will read: dSP 1 - Display 1 - enter the value that should correspond with the low analog input. EX: 4mA = 0   (0 is factory default. If another number is indicated, display has been previously programed with a display variable to equal the 4 mA input)

15. Press: Enter
    15.1 Display will read: 000000

16. Press: Up to adjust the first numerals value

17. Press: Down to scroll to the next numeral

18. Repeat steps 14 and 15 until desired Display 1 Value is indicated

19. Press: Enter once desired Display 1 Value is indicated
    19.1 Display will read: InPt 2 (Input 2)

20. Press: Enter
    20.1 Display will read: 020.00 (20mA)

21. Press: Up to adjust the first numerals value

22. Press: Down to scroll to the next numeral

23. Press: Enter once desired Input 2 Value is indicated
    23.1 Display will read: dSP 2 (Display 2)

24. Press: Enter
    24.1 Display will read: 20 (20 is factory default. If another number is indicated, display has been previously programed with a display variable to equal the 20 mA input)

25. Press: Up to adjust the first numerals value

26. Press: Down to scroll to the next numeral

27. Press: Enter once desired Display 2 Value is indicated

28. Press: Menu to exit Scale Configuration
    28.1 Display will read: SCALE

29. Press: Menu to exit Configuration and enter into Run Mode

*Note 1: Display will read: SCALE if sufficient 4-20mA Span is captured. If insufficient span is configured the display will read Error.

* Note 2: Minimum Scale setting is 0.1 mA input

Configuration 4-20mA Output

The DigaCom Universal Process Display can output specific values preconfigured with a specific mA input rating. These parameters are used to span the 4-20mA output with respect to the displayed rate or tank level values.

For example: If you want the 4-20mA output to output 4mA at 0 flow or level, and 20 mA at 1000 flow or level, enter 0 for the 4mA parameter, and 1000 for the 20mA parameter.

1. Press: Menu
        DigaCom will read: DigaTouch will read: ConFig (Configure)
2. Press: Down
        DigaCom will read: SCALE
3. Press: Down
        DigaCom will read: OutPut (4-20mA Output) *fig. 20*
4. Press: Enter
        DigaCom will read: 4 Out (4mA Output) *fig. 21*
5. Press: Enter
        DigaCom will read: 0000.00
6. Enter the displayed rate or level that corresponds to an output current of 4mA. Press:
   Up to adjust the numerals value.
        Press: Down to scroll to the next numeral.
7. Repeat step six until desired 4mA Output value is configured
8. Press: Enter
        DigaCom will read: 20 Out (20mA Output Value) *fig. 22*
9. Press: Enter
        DigaCom will read 0000.00
10. Enter the displayed rate or level that corresponds to an output current of 20mA.
        Press: Up to adjust the first numerals value. Press: Down to scroll to the next numeral.
11. Press: Enter once desired 20mA Output value is indicated on the DigaCom.

Configuration of DigaCom 2000 4-20mA INPUT Calibration
The display can be calibrated to display the process variable in engineering units by applying the maximum mA signal that equals the calibrated mA input. Input calibration requires the use of a known calibrated mA generator. The display has been calibrated from the factory with a calibrated 4-20 mA signal generator.

1. Press: Menu
     1.1   Display will read: rELAy

2. Press: Down

2.1   Display will read: ConFig

3. Press: Down
    3.1   Display will read: SCALE

4. Press: Down
    4.1   Display will read: USEr

5. Press: Enter
    5.1   Display will read PASS

6. Press: Down
    6.1   Display will read: rS-485 if display is programmed to communicate via RS-485 (See Configuration of Serial Output)

7. Press: Down
    7.1   Display will read: AddrES

8. Press: Down
    8.1   Display will read: dEFALt

9. Press: Down
    9.1   Display will read: CALib (Calibrate)

10. Press: Enter
    10.1 Display will read: PASS ? (Password)

11. Press: Enter
    11.1 Display will read: 0000 - The first numeral to the left will be flashing. Press the UP button once - the display will read 1000 - Press the Down button - the second digit from the left will flash. Press the UP button so the digit reads 9. Press the Down button - the third digit from the left will flash. Press the Up button so the digit reads 8. Press the Down button - the forth digit from the left will flash. Press the Up button so the digit reads 9. The factory default password is 1989.

12. Press: Enter
    12.1 Display will read: CAP-4 - Input 4ma into the display with a calibrated input signal generator.

13. Press: Enter
    13.1 Display will read: Numeric value representing current input. (value should be around 780 - 800)

14. Press: Enter
    14.1 Display will read: CAP-20
    14.2 Input 20mA into the display with a calibrated input signal generator.

15. Press: Enter
    15.1 Display will read: Numeric calue representing current input. (value should be around 3500-3800)

16. Press: Enter
    16.1 Display will read: USEr

17. Press Menu to exit - Display will read: Store - briefly and return automatically to the run mode.

Configuration of Password Protection

1. Press: Menu
    1.1   Display will read: rELAy

2. Press: Down
    2.1   Display will read: ConFig

3. Press: Down
    3.1   Display will read: SCALE

4. Press: Down
    4.1   Display will read: USEr (User)

5. Press: Enter
    5.1   Display will read: PASS (Password)

6. Press: Enter
    6.1   Display will read: 0000

7. Press: Up to adjust the first numerals value

8. Press: Down to scroll to the next numeral

9. Repeat steps 7 and 8 until desired Password is indicated

10. Press: Enter
    10.1 Display will read: AddrES (Modbus Address)

11. Press: Menu
    11.1 Display will read: USEr (User)

12. Press: Menu to exit Configuration and enter into Run Mode

Programming RS-485 Serial Communications Output
The DigaCom 2000 RS-485 serial communications output uses Modbus™ communications protocol and can be programmed to communicate as a HOST device or RELAY. To assign how the display will communicate follow the instruction set below.

1. Press: Enter
    1.1   Display will read: ConFig

2. Press: Down
    2.1   Display will read: SCALE

3. Press: Down
    3.1   Display will read: USEr

4. Press: Enter
   4.1 Display will read: PASS

5. Press: Down
   5.1 Display will read: RS-485 (Factory default)

6. Press: Enter to select rELAy
   6.1 Display will read: rELAy

7. Press: Enter

8. To exit program mode and enter into run mode press: Menu twice.

Configuration of Modbus Address

1. Press: Menu
        DigaCom will read Config (Configure)
 2. Press: Up
        DigaCom will read USEr (User)
3. Press: Enter
        DigaCom will read PASS (Password Configuration)
4. Press: Down
        DigaCom will read AddrES (ModBus Address) fig. 25
5. Press: Enter
        DigaCom will read: 001
6. Press: Up to configure the first numeral (0)
7. Press: Down to scroll to the next numeral
8. Press: Up to configure the second numeral (0)
9. Press: Down to scroll to the next numeral (1)

Opcode 03 - Read Holding Register

Request

Function Code	1 Byte	0x03
Starting Address	2 Bytes	0x0000 to 0xFFFF
Number of Registers	2 Bytes	1 or 2

Response

Function Code	1 Byte	0x03
Byte Count	1 Bytes	2 x Number of Registers
Register Value	2 or 4 Bytes	

Error

Function Code	1 Byte	0x83
Exception code	1 Bytes	01, 02, 03 or 04

Starting Address	Description	Allowable Values
[00][00]	Select Input	0 = 4-20 1 = 0-5 2 = 0-10 3 = FREQ 4 = PULSE
[00][01]	Sample Period	0 to 60 seconds
[00][02]	Display Mode	0 = Rate 1 = Total 2 = Both
[00][03]	Grand Total	0 = Disabled 1 = Enabled
[00][04]	Total Display format	0 = 0.01 1 = 0.1 2 = 1 3 = \10 4 = \100 5 = \1000
[00][05]	Password	0000 to 9999
[00][06]	Modbus Address	0 to 127
[00][07]	DAC Value @4mA	0 to 4095
[00][08]	DAC Value @ 20mA	0 to 4095
[00][09]	Display Decimal Point Position	0 to 5
[00][0A]	Number of Calibration Points	1 to 16
[00][0B]	Password	0000 to 9999
[00][30]	Low Flow Cutoff	0.0 to 99999.0
[00][32]	Displayed Value at 4mA	0.0 to 9999.99
[00][34]	Displayed Value at 20mA	0.0 to 999999
[00][36]	Setpoint 1	0.0 to 999999
[00][38]	Setpoint 2	0.0 to 999999
[00][3A]	Setpoint 3	0.0 to 999999
[00][3C]	Setpoint 4	0.0 to 999999
[00][50]	Cal Point Input 1	0.0 to 999999
[00][52]	Span at Cal Point 1	0.0 to 999999
[00][54]	Cal Point Input 2	0.0 to 999999
[00][56]	Span at Cal Point 2	0.0 to 999999
[00][58]	Cal Point Input 3	0.0 to 999999
[00][5A]	Span at Cal Point 3	0.0 to 999999
[00][5C]	Cal Point Input 4	0.0 to 999999
[00][5E]	Span at Cal Point 4	0.0 to 999999
[00][60]	Cal Point Input 5	0.0 to 999999
[00][62]	Span at Cal Point 5	0.0 to 999999
[00][64]	Cal Point Input 6	0.0 to 999999
[00][66]	Span at Cal Point 6	0.0 to 999999
[00][68]	Cal Point Input 7	0.0 to 999999
[00][6A]	Span at Cal Point 7	0.0 to 999999
[00][6C]	Cal Point Input 8	0.0 to 999999
[00][6E]	Span at Cal Point 8	0.0 to 999999
[00][70]	Cal Point Input 9	0.0 to 999999
[00][72]	Span at Cal Point 9	0.0 to 999999
[00][74]	Cal Point Input 10	0.0 to 999999
[00][76]	Span at Cal Point 10	0.0 to 999999
[00][78]	Cal Point Input 11	0.0 to 999999
[00][7A]	Span at Cal Point 11	0.0 to 999999
[00][7C]	Cal Point Input 12	0.0 to 999999
[00][7E]	Span at Cal Point 12	0.0 to 999999
[00][80]	Cal Point Input 13	0.0 to 999999
[00][82]	Span at Cal Point 13	0.0 to 999999
[00][84]	Cal Point Input 14	0.0 to 999999
[00][86]	Span at Cal Point 14	0.0 to 999999
[00][88]	Cal Point Input 15	0.0 to 999999
[00][8A]	Span at Cal Point 15	0.0 to 999999
[00][8C]	Cal Point Input 16	0.0 to 999999
[00][8E]	Span at Cal Point 16	0.0 to 999999
[01][00] Thru [01][0F]	User ID Field #1	Next 15 registers = total 30 bytes
[01][10] Thru [01][1F]	User ID Field #2	Next 15 registers = total 30 bytes

Opcode 04 - Read Input Registers

Request

Function Code	1 Byte	0x04
Starting Address	2 Bytes	0x0000 to 0xFFFF
Number of Registers	2 Bytes	1 or 2

Response

Function Code	1 Byte	0x04
Byte Count	1 Bytes	2 x Number of Registers
Register Value	2 or 4 Bytes	

Error

Function Code	1 Byte	0x84
Exception code	1 Bytes	01, 02, 03 or 04

Starting Address	Description	Return Values
[00][00]	Device ID	0x0001 for DigaCom 0x0002 for DigaTouch 0x0003 for DigaCom-S 0x0004 for DigaCom-T
[00][01]	Software Version	0x0100 for Version 1.00 0x0121 for Version 1.21
[00][02]	Displayed Level/Rate fp – MSB	
[00][03]	Displayed Level/Rate fp – LSB	
[00][04]	Total fp – MSB	
[00][05]	Total fp – LSB	
[00][06]	Grand Total fp – MSB	
[00][07]	Grand Total fp – LSB	
[00][08]		
[00][09]		
[00][0A] [00][0F]	Spares	

The flow rate is sent in single precision (4 byte) floating point format. The first register is the first 16 bits. The second register is the last 16 bits.

Command: [addr][04][00][02][00][02][crc-16]
Reply: [addr][04][02][data HI][data LO][crc-16]

Opcode 05 - Write Single Coil

Request

Function Code	1 Byte	0x05
Output Address	2 Bytes	0x0000 to 0xFFFF
Output Value	2 Bytes	0x0000 or 0xFF00

Response

Function Code	1 Byte	0x05
Output Address	2 Bytes	0x0000 to 0xFFFF
Output Value	2 Bytes	0x0000 or 0xFF00

Error

Function Code	1 Byte	0x85
Exception code	1 Bytes	01, 02, 03 or 04

Coil Address	Description
[00][00]	Reset Total
[00][01]	Reset Grand total
[00][02] to [00][0F]	Spare
[00][10]	Capture 4mA Input
[00][11]	Capture 20mA Input
[00][12]	Capture 1V Input
[00][13]	Capture 5V Input
[00][14]	Capture 10V Input
[00][15]	Store Factory Defaults
[00][16]	Restore Factory Defaults
[00][17]	Write System Config to Flash
[00][18] and up	Spare

Setting the coil to 1 will initiate the command. Bit is automatically cleared after execution of command.

Command: [addr][05][00][01][FF][00][crc-16]
Reply: [addr][05][00][01][FF][00][crc-16]

Opcode 16 - Write Multiple Registers

Request

Function Code	1 Byte	0x06
Starting Address	2 Bytes	0x0000 to 0xFFFF
Number of Registers	2 Bytes	1 or 2
Number of Bytes	1 Byte	2 or 4
Register Value	2 or 4 bytes	Data Value

Response

Function Code	1 Byte	0x06
Byte Count	1 Bytes	2 x Number of Registers
Number of Registers	2 Bytes	1 or 2

Error

Function Code	1 Byte	0x96
Exception code	1 Bytes	01, 02, 03 or 04

Starting Address	Description	Allowable Values
[00][00]	Select Input	0 = 4-20 1 = 0-5 2 = 0-10 3 = FREQ 4 = PULSE
[00][01]	Sample Period	0 to 60 seconds
[00][02]	Display Mode	0 = Rate 1 = Total 2 = Both
[00][03]	Grand Total	0 = Disabled 1 = Enabled
[00][04]	Total Display format	0 = 0.01 1 = 0.1 2 = 1 3 = \10 4 = \100 5 = \1000
[00][05]	Password	0000 to 9999
[00][06]	Modbus Address	0 to 127
[00][07]	DAC Value @4mA	0 to 4095
[00][08]	DAC Value @ 20mA	0 to 4095
[00][09]	Display Decimal Point Position	0 to 5
[00][0A]	Number of Calibration Points	1 to 16
[00][0B]	Password	0000 to 9999
[00][30]	Low Flow Cutoff	0.0 to 99999.0
[00][32]	Displayed Value at 4mA	0.0 to 9999.99
[00][34]	Displayed Value at 20mA	0.0 to 999999
[00][36]	Setpoint 1	0.0 to 999999
[00][38]	Setpoint 2	0.0 to 999999
[00][3A]	Setpoint 3	0.0 to 999999
[00][3C]	Setpoint 4	0.0 to 999999

[00][50]	Cal Point Input 1	0.0 to 999999
[00][52]	Span at Cal Point 1	0.0 to 999999
[00][54]	Cal Point Input 2	0.0 to 999999
[00][56]	Span at Cal Point 2	0.0 to 999999
[00][58]	Cal Point Input 3	0.0 to 999999
[00][5A]	Span at Cal Point 3	0.0 to 999999
[00][5C]	Cal Point Input 4	0.0 to 999999
[00][5E]	Span at Cal Point 4	0.0 to 999999
[00][60]	Cal Point Input 5	0.0 to 999999
[00][62]	Span at Cal Point 5	0.0 to 999999
[00][64]	Cal Point Input 6	0.0 to 999999
[00][66]	Span at Cal Point 6	0.0 to 999999
[00][68]	Cal Point Input 7	0.0 to 999999
[00][6A]	Span at Cal Point 7	0.0 to 999999
[00][6C]	Cal Point Input 8	0.0 to 999999
[00][6E]	Span at Cal Point 8	0.0 to 999999
[00][70]	Cal Point Input 9	0.0 to 999999
[00][72]	Span at Cal Point 9	0.0 to 999999
[00][74]	Cal Point Input 10	0.0 to 999999
[00][76]	Span at Cal Point 10	0.0 to 999999
[00][78]	Cal Point Input 11	0.0 to 999999
[00][7A]	Span at Cal Point 11	0.0 to 999999
[00][7C]	Cal Point Input 12	0.0 to 999999
[00][7E]	Span at Cal Point 12	0.0 to 999999
[00][80]	Cal Point Input 13	0.0 to 999999
[00][82]	Span at Cal Point 13	0.0 to 999999
[00][84]	Cal Point Input 14	0.0 to 999999
[00][86]	Span at Cal Point 14	0.0 to 999999
[00][88]	Cal Point Input 15	0.0 to 999999
[00][8A]	Span at Cal Point 15	0.0 to 999999
[00][8C]	Cal Point Input 16	0.0 to 999999
[00][8E]	Span at Cal Point 16	0.0 to 999999
[01][00]	User ID Field #1	Next 15 registers = total 30 bytes
Thru		
[01][0F]		
[01][10]	User ID Field #2	Next 15 registers = total 30 bytes
Thru		
[01][1F]		

DigaLink™ 3.0 PC Based Interactive Software

ATTENTION: Flow Line Option Corporation is in no way responsible for configuring the end users network. FLO-Corp cannot anticipate Network Security, FIrewalls, Anti-Virus Software, or any other network configurations that may not allow DigaTouch and DigaLink products to communicate properly. Please consult with your IT department if you are experiencing problems.

Introduction

DigaLink™ 3.0 Interactive Software enables users to remotely configure DigaCom™ and/or DigaTouch™ Universal Process Displays through RS485 or Ethernet TCP/IP connections. DigaLink also allows users to remotely monitor numerical data from a PC. The software locates, connects, monitors, and allows configuration of all DigaCom and DigaTouch devices found on the local Ethernet and RS485 network providing a current meter reading for each device. Both DigaCom and DigaTouch devices can be configured to continually store numerical data at varying date and time intervals.

Installation & Setup

Software Installation
1. In your internet browser go to http://flowlineoptions.com/digacorp/dldownload.php and follow the onscreen installation instructions

Setting up your Universal Process Display for remote monitoring
1. To open the software program go to the Start Menu > All Programs > Flow Line Options > DigaLink
2. The DigaLink screen appears and automatically beings searching for DigaCom and DigaTouch devices
3. When a DigaCom or DigaTouch device is located, an image of the device with its current meter reading is displayed in the top portion of the screen under the Devices tab and the device information (status, name, IP address, value) is listed and highlighted in the bottom portion of the screen with the selected device highlighted and its image and current meter reading displayed in the top portion of the screen
4. Select the "Discover Devices" button to search for devices

Status Indicators
Status indicators provide the current status of each device by displaying either a green, red, orange or gray circle in the status column. The status indicators are as follows:
Green - Indicates the device is available and meter readings are current
Orange - Indicates that the device is in the process of aquiring network connectivity
Red - Indicates the device is unavailable and meter readings are not current. This occurs when network connectivity is lost or the device is turned off.
Grey - Indicates the device is unavailable and meter readings are not current. This occurs when the device is unavailable at the time the software is opened.

Display, Datalog & Configure
DigaLink has three primary functions:
1. Display: Display: Used to remotely monitor your application
2. Data Log: Used to record application data
3. Configure: Used to remotely interface and configure directly with the device

These three tabs (Display, DataLog and Configure) are located in the top left corner of the DigaLink screen
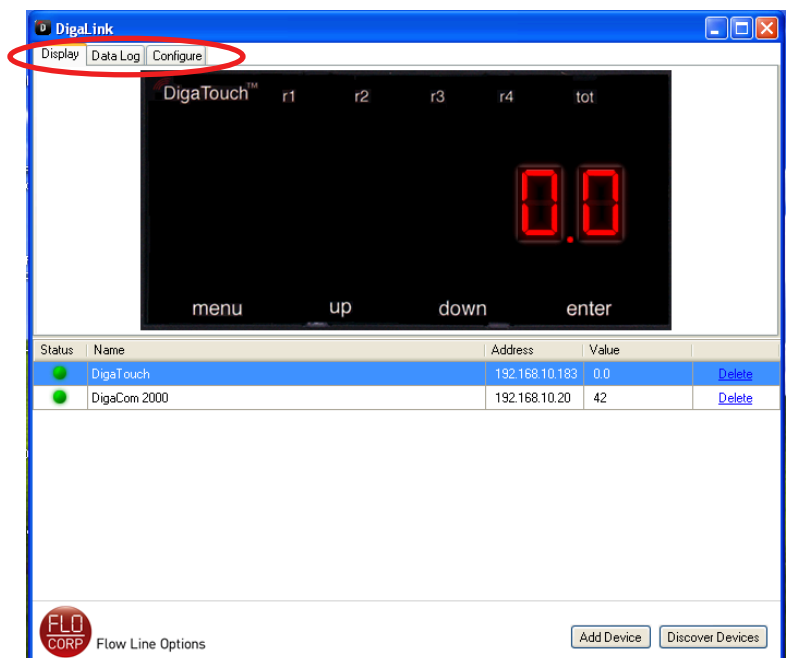
Remote Configuration of Devices

Select the "Configure" tab located at the top left portion of the DigaLink screen (The Configure DevicevSettings will appear)

Note: The device must be highlighted in the device screen to allow configuration
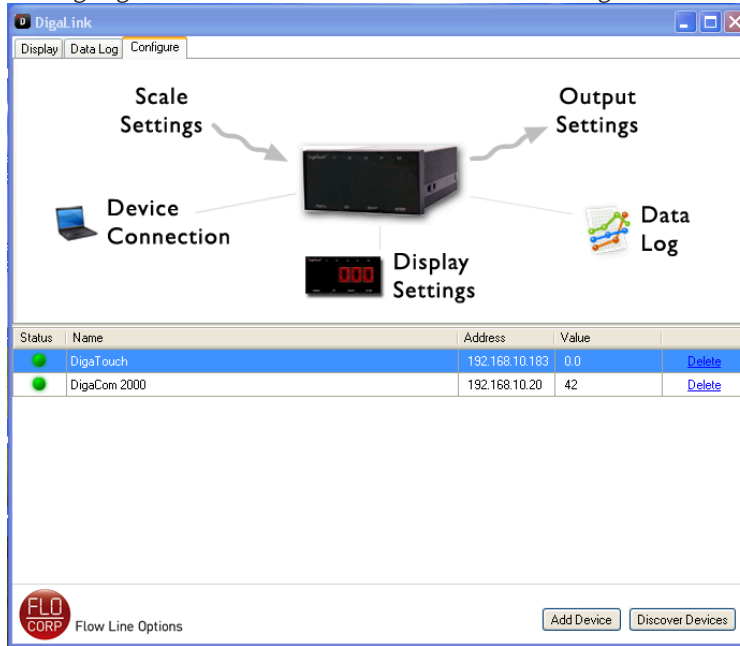
Configuration of Password, Input, Scale & Linearization Points

DigaLink will allow users to configure the password, input, scale and linearization points. To configure these settings, click on "Scale Settings" located under the configure tab

Password

To configure a DigaCom 2000 or DigaTouch lockout password for both the display and DigaLink Software, select the "Change Password" link
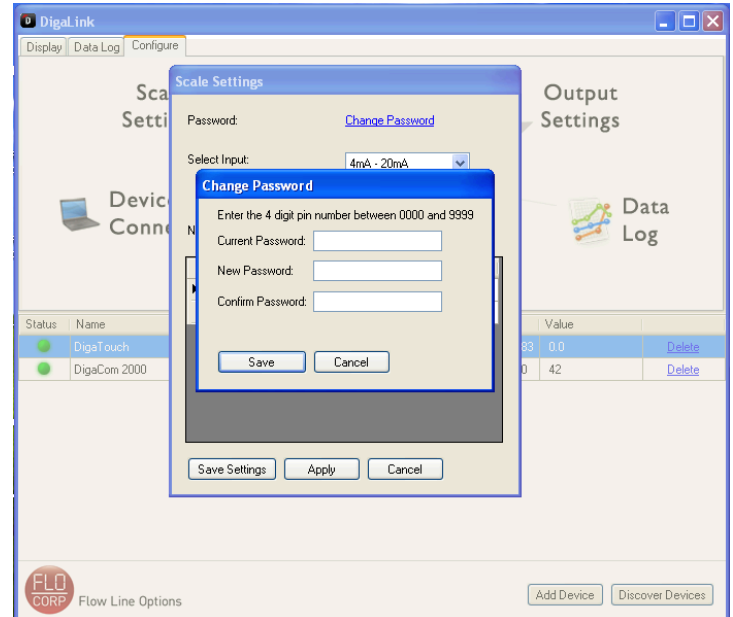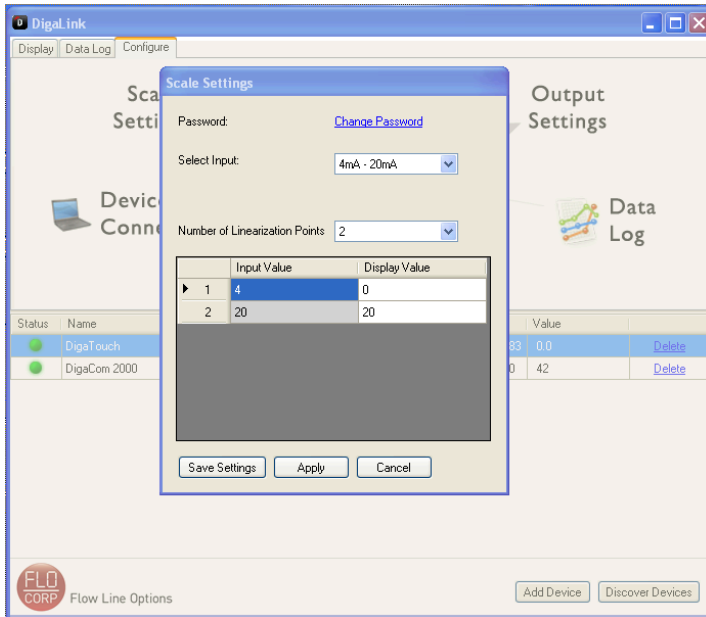
Select Input **(DigaTouch Model Only)**

With the DigaTouch Universal Process Display, DigaLink will allow you to configure the appropriate input for your application. This can be done in the Scale Settings Menu under the Select Input drop down menu. Once the menu is exposed, the user can select: 4mA-20mA, 0V-5V, 0V-10V, Frequency or Pulse.
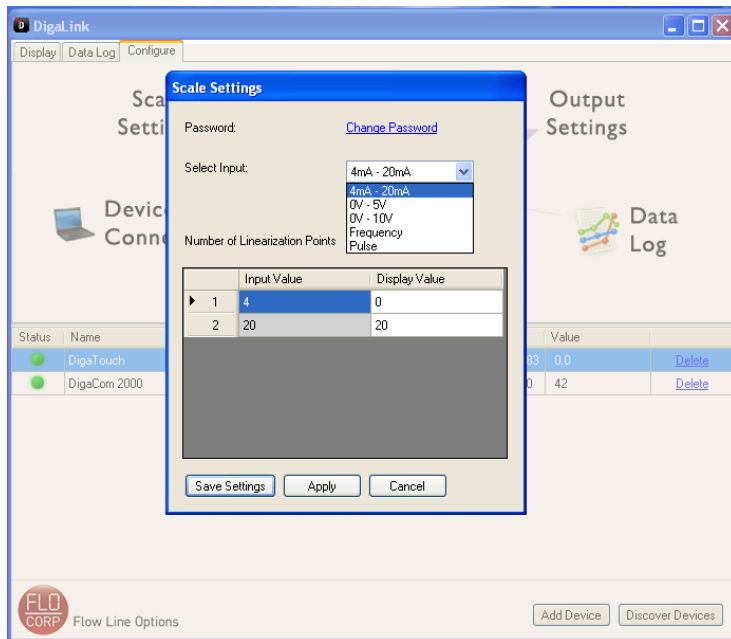
Linearization Point Configuration

The DigaCom 2000 and DigaTouch can be calibrated to display the process variable in engineering units by applying the maximum signal that equals the maximum process variable.

Example: 4MA = 0 & 20MA = 2890
Example: 20MA = 0 & 4 MA = 2890
Example: 0V = 0 & 5V = 2890
Example: 5V = 0 & 0V = 2890
Example: 0V = 0 & 10V = 2890
Example: 10V = 0 & 0V = 2890

To Configure Linearization Points (16 total possible) select first the Number of Linearization Points through the Drop Down Menu. Once the number of points is selected, the Input Value and Display Value Chart (located below the Number of Linearization Points Drop Down Menu) will expand or contract based on the number of points selected.

Enter the Display Value with the corresponding Input Value.

Once configured, select Apply and then Save Settings. Once saved, DigaLink will return to the Configure screen.
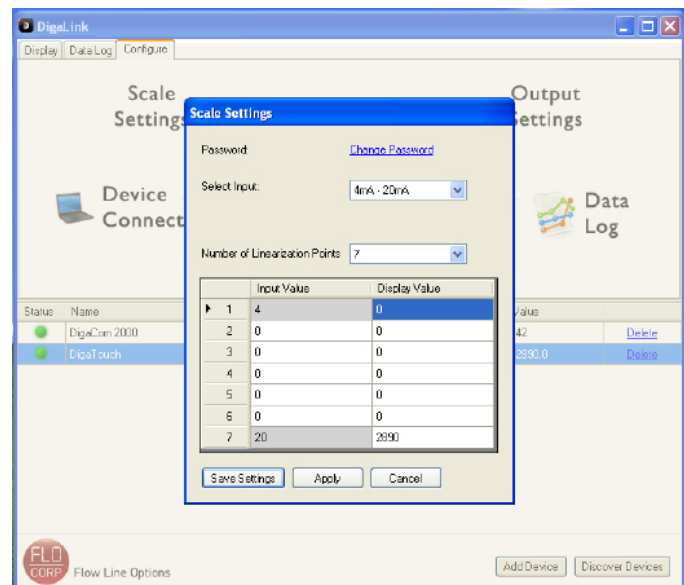
For **Pulse** Input (DigaTouch Only), select the sample period that corresponds with your application (Configurable from 1 to 60 Samples per Second). Once configured, select Apply and then Save Settings. Once saved, DigaLink will return to the Configure Screen. *Note: Input values 4mA, 20mA, 0V, 5V, 10V, 0 and 30000 Frequency Values, 0 and 3500 Pulse Input Values are un-configurable.*
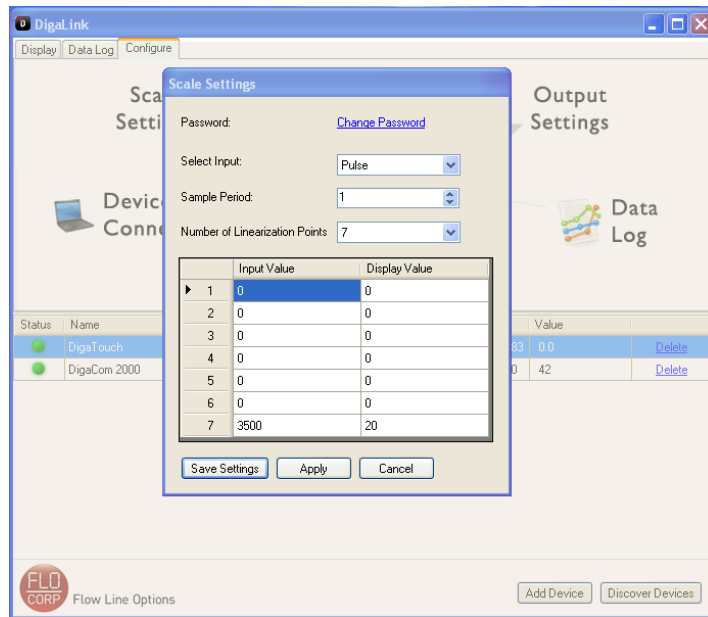
Device Connection
Select Device Connection to apply unique names, configure the DigaLink refresh interval, configure Device Communication and ModBus address on DigaCom 2000 and DigaTouch Process Displays.

Assigning a unique name to the devices
Select Device Connection from the Configure Tab. Through the Device Connection Menu, click in the DigaLink Device Name box and enter the desired device name. Select Apply and then select Save Settings. The new name will be applied in the Device List Screen.

DigaLink Refresh Interval
Refresh Interval – Select a time interval from the drop down list to enable the DigaCom 2000 or DigaTouch to continually update the numerical data displayed on DigaLink at the designated time interval.

Device Connection
The DigaCom 2000 and DigaTouch can communicate with DigaLink through Ethernet TCP/IP and RS488 ModBus.

RS485 Communication
When connecting through the RS485 interface of a DigaCom 2000 or DigaTouch Process Display, select the COM Port Radio Button. The COM Port Drop Down Menu becomes active.
Select the appropriate COM Port the device is connected to from the drop down list and click Apply and then Save Settings

TCP/IP Automatic Discovery
When connecting through TCP/IP Automatic Discovery (Default), DigaLink will actively go out and search for DigaCom 2000's and DigaTouch Process Displays enabled on your network. Please note that DigaLink will only do this upon opening DigaLink. Once open and the device has not yet been discovered, select the Discover Devices button located in the bottom right corner of DigaLink.
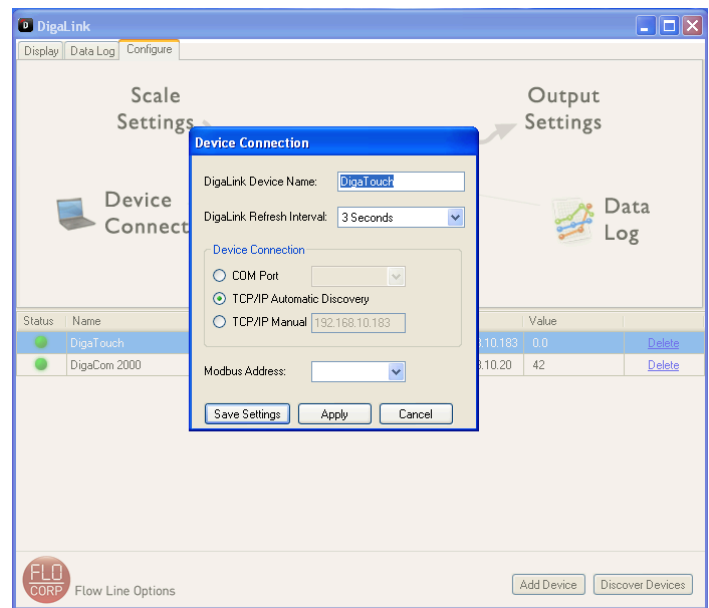
TCP/IP Manual (Assigning a Static IP)

When connecting to a device through a Static IP to a DigaCom 2000 or DigaTouch Process Display, select the TCP/IP Manual Radio Button. The IP Address text box becomes active. Enter the device IP Address in the text box then click Apply and then Save Settings.

Modbus Address

The DigaCom 2000 and DigaTouch can communicate to DigaLink through RS485 or Ethernet and simultaneously communicate to other devices via ModBus protocol. To implement this feature, select the ModBus address that you want to assign to the DigaCom 2000 or DigaTouch and click Apply and then Save Settings.
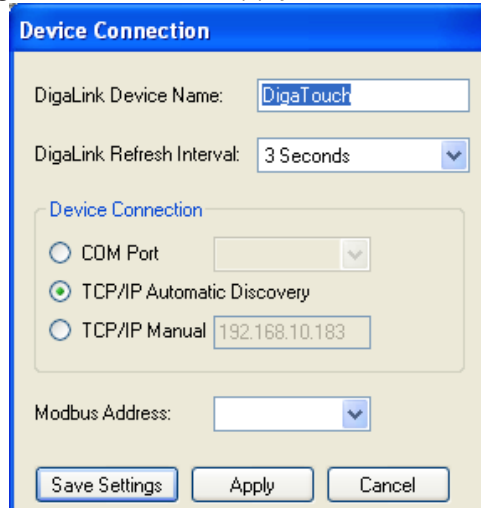
Display Settings

Through the Display Settings Menu, DigaLink users can alter their DigaCom 2000T and DigaTouch display modes between Rate, Total or Both Rate and Total. Users can adjust the Decimal Point Position, Low Flow/Level Cutoff Value, implement a
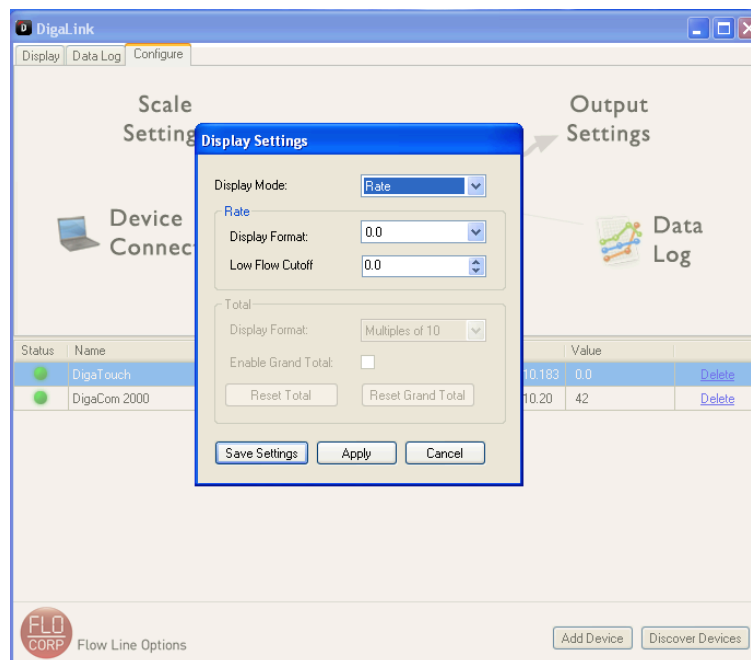
Totalizer Exponent Factor, turn ON and OFF the Grand Totalizer and reset both the Totalizer and Grand Totalizer.

Display Mode: Adjusting between Rate, Total or Both
To view the Rate, Totalizer or Both Rate and the Total of your process application, Select Display Settings from the Configure Tab. Click the drop down menu for Display Mode. Select the setting you wish to see both on the device and on DigaLink. Click Apply and then Save Settings.
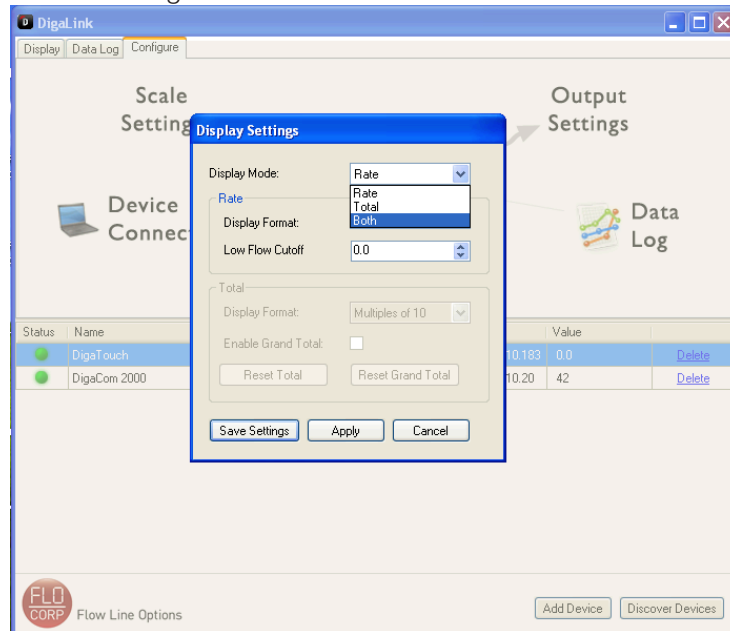
Decimanl Point Position
To adjust the Decimal Point position on the device and on DigaLink select the drop down menu located next to Display Format. Select the Decimal Point Position you wish to use for your process application.
Once configured, click Apply and then Save Settings.
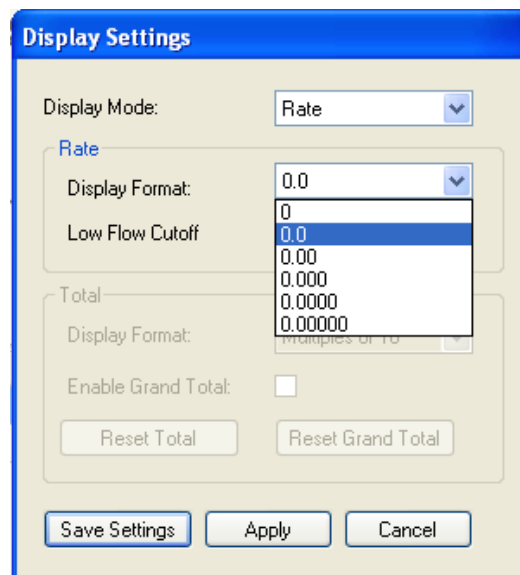
Low Flow/Level Cutoff
DigaCom 2000 & DigaTouch Process Displays can be configured to display a minimum rate. If your process application requires you to read any value over 5; values under 5 are of no importance. The device can be configured to read only values above a preset minimum value. To configure the Low Flow/Level Cutoff select the text box located next to Low Flow Cutoff. Adjust the value either by manually entering a numeric value or by adjusting the up and down arrows. Once configured, select Apply and then Save Settings.

Totalizer Exponent Factor

The Totalizer exponent factor can only be adjusted if Totalizer or Both is selected in the Display Mode. To adjust the exponent factor select the drop down menu located next to Display Format in Total Box. Once the desired exponent is selected click Apply and the Save Settings.

Grand Totalizer

To activate the Grand Totalizer, select the Enable Grand Total box located next to Enable Grand Total. Click Apply and then Save Settings.

Note: The Grand Totalizer can only be viewed on the physical DigaCom 2000 or DigaTouch device itself. You will be unable to view this on DigaLink.

Reset Total/Grand Total

To reset the Totalizer and/or Grand Totalizer click Reset Total and/or Reset Grand Total located in the Total Box. Once reset, click Apply and then Save Settings.

Data Log Settings

The DigaLink Data Log Settings allow users to adjust the Logging Interval (how often users choose to record data from their DigaCom 2000 or DigaTouch) and the user can choose when DigaLink should Delete Datalogged events. To configure these settings select Data Log from the Configure Tab.

Logging Interval

To configure the DigaLink Logging Interval select the drop down menu located next to Logging Interval. Select the desired setting and click Apply and then Save Settings.

Delete Logs Older Than

To delete logs after a specific time select the drop down menu located next to Delete Logs Older Than. Select the desired setting and click Apply and then Save Settings.

Output Settings (Only configurable with the DigaTouch)

DigaLink will allow you to configure both relay settings and output settings for the DigaTouch. To configure these settings select Output from the Configure Tab.

Relay Setpoint's 1-4

To configure relay setpoint's select one text box located next to Setpoint 1, 2, 3 or 4. Alter the value by manually entering a value or by adjustment of the up and down arrows. Once configured, select Apply and then Save Settings.

4-20mA Output

To adjust the Output at 4mA select the text box located next to Output at 4mA. Either manually enter a numeric value or use the up and down arrows to adjust. Once configured select Apply and repeat steps for Output at 20mA. Click Save Settings to finish.
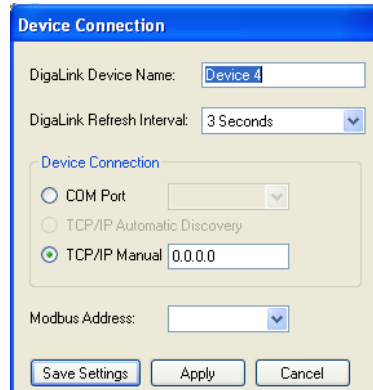
Manually Adding Devices

When a device is not found automatically on the local Ethernet network, select the Add Device button (located in the bottom right corner) to manually connect to a device. The Configure Device Settings screen appears with the options to enter a Device Name and select a Refresh Interval and Logging Interval.
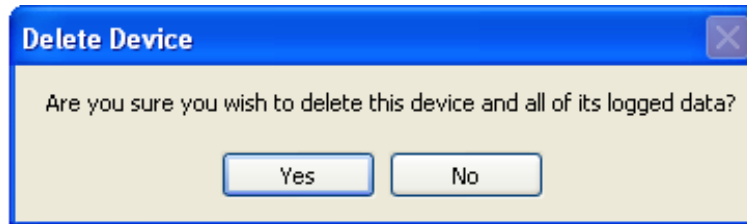

Deleting Devices

To delete a device, click on the device and select the delete button located in the Device List Screen. The following screen will appear:

Select Yes to delete the device or select No to keep the device.

Data Log Tab

Select the Data Log tab to access the logged numerical data from each device.

Filter From/To – Select the Filter From checkbox and To checkbox to change the date and time intervals displayed at the bottom of the history chart. The logged numerical data in the history chart is filtered according to the specified date and time range.

Chart Min/Max – Adjust the numbers in the Min and Max boxes to change the minimum and maximum amounts appearing on the right side of the history chart. The minimum and maximum amounts can be set at different intervals for each device and will be saved.
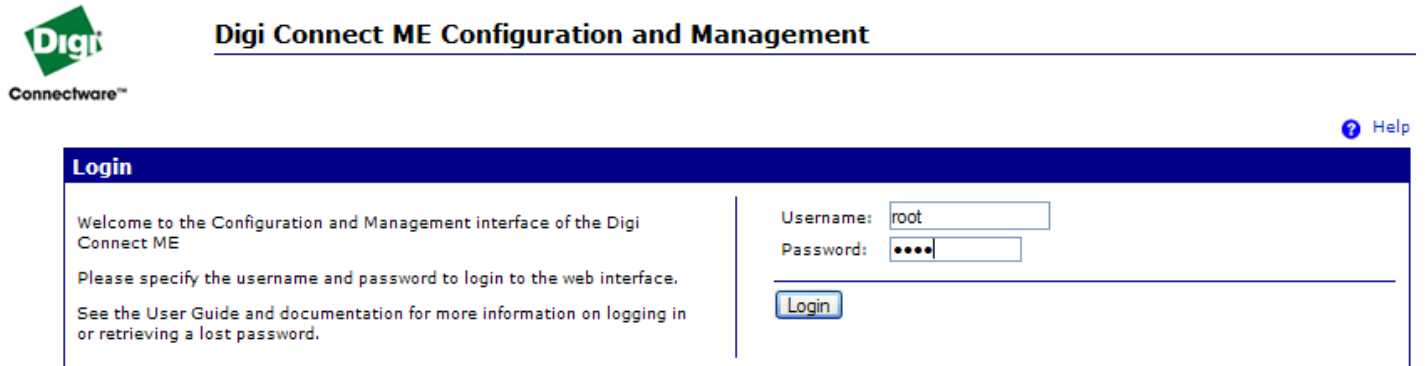
Export – Select the Export button to export and save the logged numerical data appearing on the history chart as a Comma
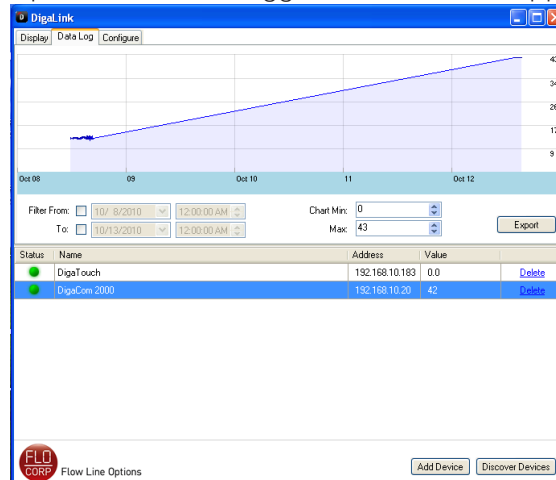
Separated Value (CSV) file. If Microsoft Office is installed on the computer, the file can be opened with Microsoft Excel.

Static IP Address and Gateway Configuration
1. Locate and write down the IP address from DigaLink. Leave DigaLink open.
2. Enter the IP address into your web browser address window in this format: http://xxx.xxx.xxx -with xxx.xxx.xxx as the IP address and NO .com at the end.
3. Press enter
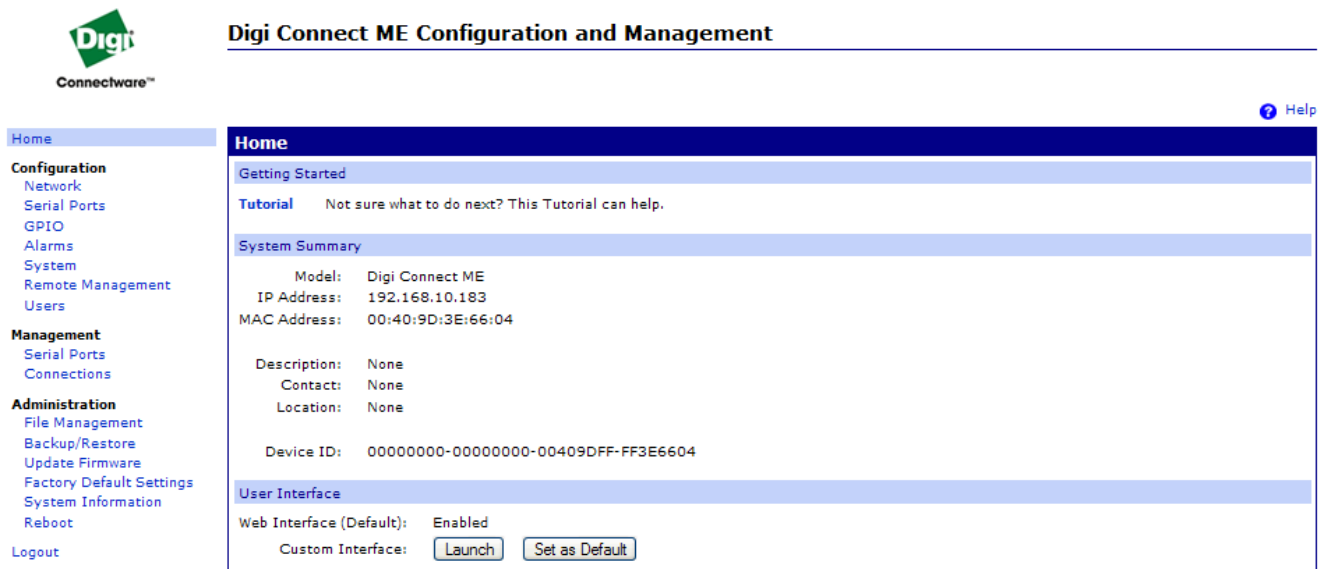
5. Sign in to Digi Connect with the USERNAME root and PASSWORD dbps.
6. Login

7. Select Network, located under Configuration on the left hand side of the browser window

Connectware™

❓ Help

Configuration
Network
Serial Ports
GPIO
Alarms
System
Remote Management
Users

Management
Serial Ports
Connections

Administration
File Management
Backup/Restore
Update Firmware
Factory Default Settings
System Information
Reboot

Logout

Network Configuration

▼ IP Settings

⭘ Obtain an IP address automatically using DHCP *
⦿ Use the following IP address:

* IP Address: 192.168.10.183
* Subnet Mask: 255.255.255.0
Default Gateway: 192.168.10.1

* Changes to DHCP, IP address and Subnet Mask require a reboot to take effect.

[Apply]

▶ Network Services Settings
▶ Advanced Network Settings

8. Change the Radio button to: USE THE FOLLOWING IP ADDRESS

9. Enter the desired IP address
10. Enter the desired Subnet Mask address
11. Enter the desired Default Gateway address
12. Click Apply
13. Go back to DigaLink and click Refresh List
14. DigaLink will go out and find the new STATIC IP address through the desired Gateway.
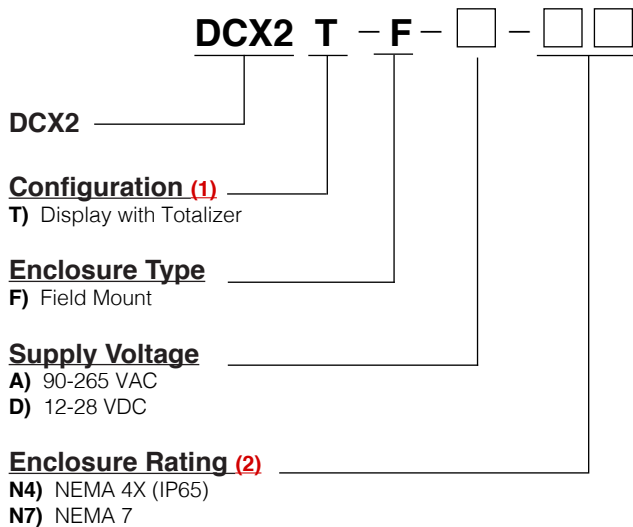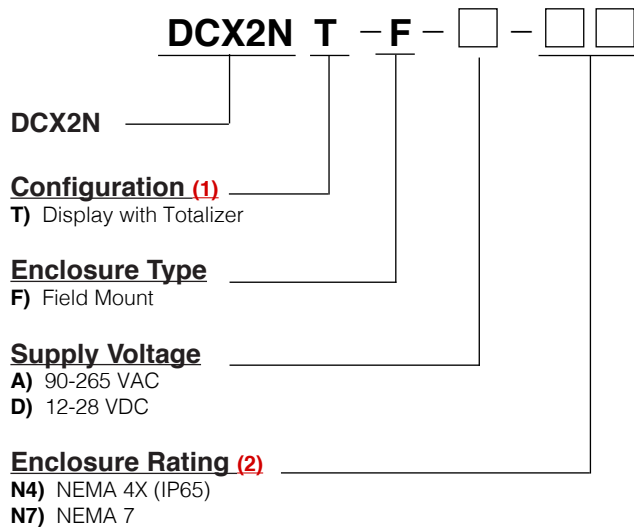
Ordering Information

Use the diagram below, working from left to right to construct your FLO-CORP Model Number.
Simply match the category number to the corresponding box number.

Example: DCX2T-F-A-N4   *DigaCom 2000 with Ethernet, Field Mount, 90-265 VAC Supply Voltage, NEMA 4X Enclosure*

DigaCom 2000 <u>with</u> Ethernet

DCX2 T − F − ☐ − ☐☐

DCX2

Configuration (1)
T) Display with Totalizer

Enclosure Type
F) Field Mount

Supply Voltage
A) 90-265 VAC
D) 12-28 VDC

Enclosure Rating (2)
N4) NEMA 4X (IP65)
N7) NEMA 7

DigaCom 2000 <u>without</u> Ethernet

DCX2N T − F − ☐ − ☐☐

DCX2N

Configuration (1)
T) Display with Totalizer

Enclosure Type
F) Field Mount

Supply Voltage
A) 90-265 VAC
D) 12-28 VDC

Enclosure Rating (2)
N4) NEMA 4X (IP65)
N7) NEMA 7

Ordering Notes:
(1) Select the best configuration based on your requirements
(2) To order the NEMA 4 Battery Powered Enclosure, place AN4B at the end of the P/N: (ie: DCX2T-F-A-N4-AN4B)
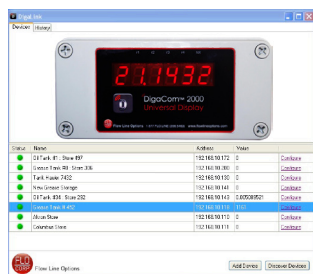   * For relay outputs, use eXmod relay expansion module (p/n: DXM1)

*eXmod™ Relay Expansion Module

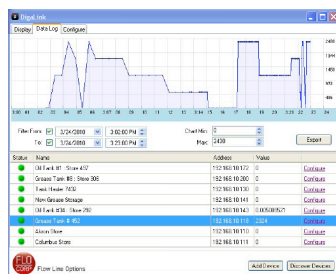## 🇩 DigaLink™ 3.0 Interactive Software with E-mail Alerts

To download DigaLink™ 3.0, please visit **www.flowlineoptions.com/digacorp/dldownload.php**
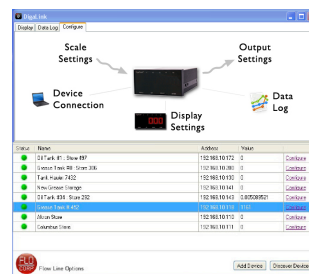
Display Screenshot

Monitor multiple devices
simultaneously

Data Log Screenshot

Record application data,
then export to Excel

Configure Screenshot

Simple device configuration