



PT4 ION INPUT
OUTPUT NETWORK
ИЕЛМОВК
ОЦЬВЛ
ИИНО



COMPLETE WATER QUALITY MONITORING CONTROL



Point Four
Systems Inc.

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Warranty



WARRANTY AND CONDITIONS

Point Four Systems Inc. warrants its equipment under normal use against any and all defects from the date of purchase for a period of one (1) year from the date of purchase. Any failure resulting from defective parts or faulty workmanship, as determined during evaluation by Point Four Systems Inc., will be repaired or replaced under warranty.

Point Four Systems Inc.'s obligation under the warranty is conditional upon:

- a) such equipment being installed, consistently used and maintained in accordance with Point Four Systems Inc.'s written instructions, specifications and safeguards.
- b) the defect(s) not being the result of misuse, neglect, accident or improper application nor of any user attempts at modification or repair.
- c) the purchaser reporting to Point Four Systems Inc. any defect within seven (7) days of its occurrence. Point Four Systems Inc. may request that the equipment in question be returned to Point Four Systems Inc.'s premises at the purchaser's cost within two (2) weeks of notification. Point Four may also require a written report by the purchaser of the circumstances in which the defect occurred.
- d) the purchaser certifies acceptance of the warranty as set out.

LIMITS OF LIABILITY

Point Four Systems Inc.'s obligations specifically exclude any liability whatsoever for claims by the purchaser or user or any other persons or parties:

- a) in respect of merchantability or fitness for a particular purpose.
- b) for any special, indirect, incidental or consequential damages resulting from the use, or as a result of a malfunction of the equipment.
- c) for personal injury or any medical or disability claims or for compensation arising therefrom.

This warranty and the conditions, limitations and exclusions is accepted by the purchaser as the only authorized and applicable warranty and that there are no other warranties or conditions, oral or written, expressed or implied.

Introduction

Welcome to the PT4 ION Input Output Network by Point Four Systems Inc.

This manual is designed as a guide to assist users in becoming familiar with the various functions of the ION system. Each section of this manual is setup to easily guide users through all stages of installation, setup and maintenance. Starting from unpacking and inspecting the ION box, this manual will explain all parts and functions of the system to allow users to get the most out of the ION for all their system monitoring needs.

General Safety

**PLEASE READ BEFORE PROCEEDING WITH INSTALLATION, OTHERWISE
EQUIPMENT DAMAGE OR INJURY MAY RESULT**

Please consult a qualified electrician when installing or servicing any equipment operating under high voltage.

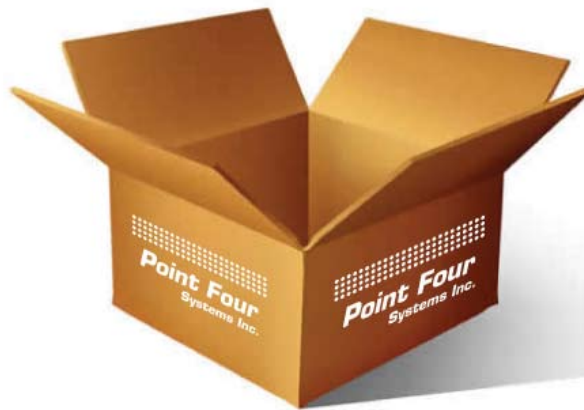
Unpack all system components and inspect for shipping damage.

Shipped Components

*Note: Before unpacking the unit inspect the box for shipping damage and report any problems to your supplier or Point Four Systems.

A typical ION System will be supplied with the following components, unpack and inspect that all items are present and in good condition. Check the “Shipped Components List” supplied with your unit for a list of all custom components for your specific ION System.

- ION Main Unit
- Power Supply/Adapter
- Junction Box
- Probes
- Probe Service Kit
- ION Manual



Installation Guide Lines

Please consult a qualified electrician when installing or servicing any equipment operating under high voltage.

Select a suitable mounting location for equipment. This location should be in a dry, and enclosed environment. A rain protection structure or enclosure should be used if this is not available. The equipment should be located as far as possible from electrical panels, VFD drive motors, radio equipment or any other electrical equipment that might cause interference.

The unit should be mounted at shoulder height to allow access by all users. The main unit should be installed away from direct sunlight, or any sources of heat.

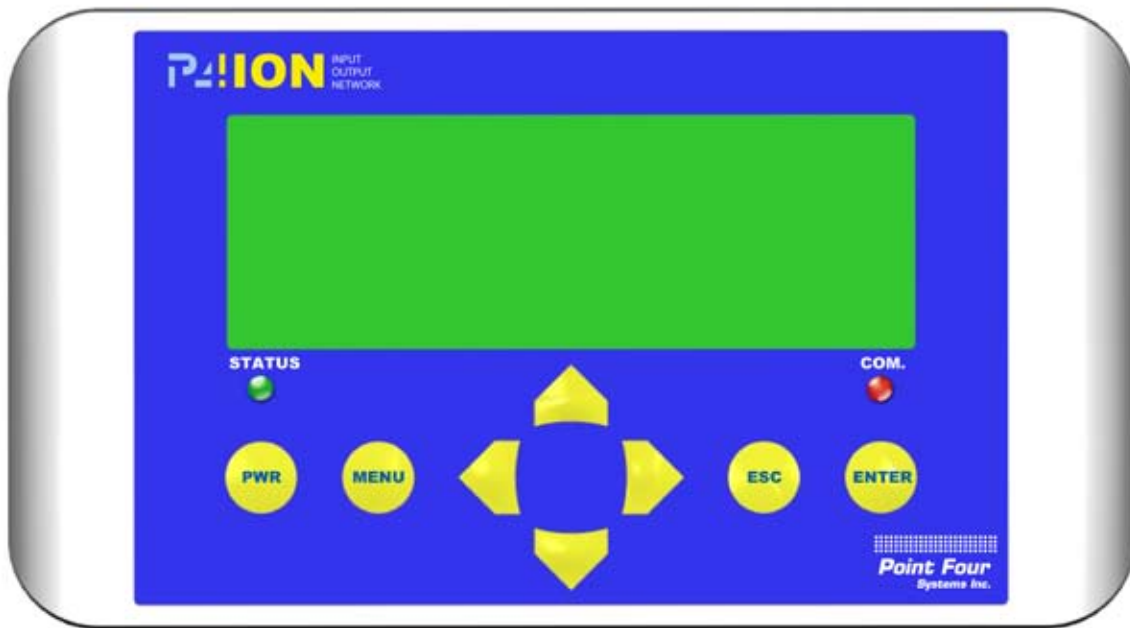
Only PFS approved system cable must be used. Cable should be 18-24 AWG, shielded and suitable for outdoor use. Please consult PFS for more information.

Cable should be installed in a suitable conduit to prevent damage. All cable runs should NOT be in close proximity of high voltage lines.

It is recommended that a field junction box be placed at each tank to allow for easy probe connection.

P4 ION SYSTEM COMPONENTS

ION Controller

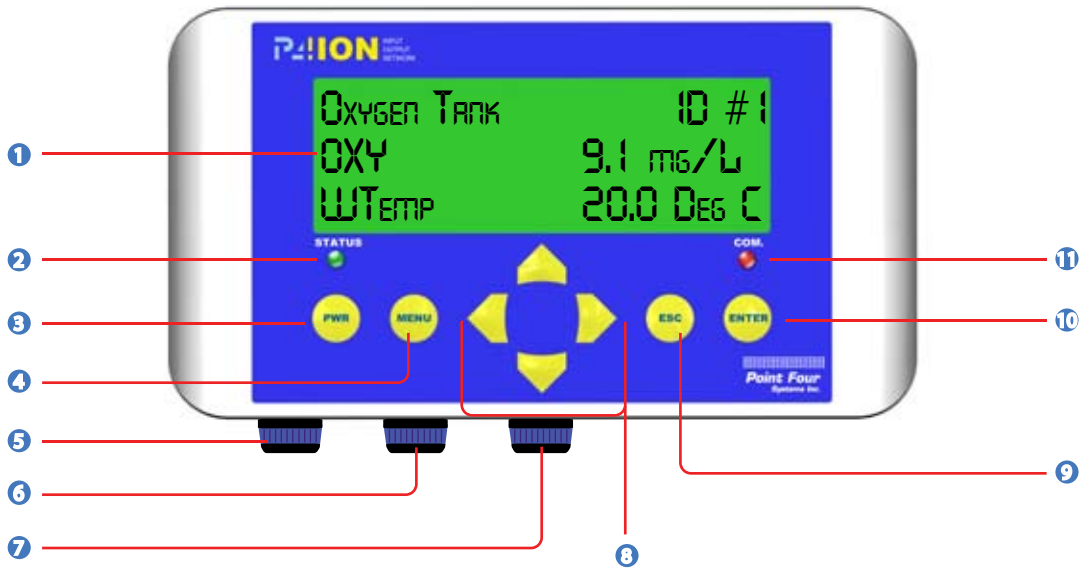


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System Components

PT4 ION Controller



Controls & Functions

| Controls | Functions |
|-------------------|--|
| ① ION LCD Display | 4 x 20 Backlit Alpha numeric |
| ② Status LED | Displays System Status if error occurs |
| ③ PWR Button | When On/Off is enables, used to turn on power |
| ④ Menu Button | Used to access the main menu setup screen |
| ⑤ Power Input | 12 VDC power supply input |
| ⑥ PC Output | RS232 or RS485 PC or Data logger output |
| ⑦ Databus Input | Connects ION controller to Probes, Relays, etc |
| ⑧ Navigation Keys | Used to navigate menus |
| ⑨ ESC Button | Used to exit menus |
| ⑩ ENTER Button | Used to except value entries |
| ⑪ COM Light | Displays activity on ION Databus |

ION Controller

The PT4 ION controller functions as a standalone display/operator interface unit. Its main function is to read and display information transmitted on the ION databus system as well as provides control information to the ROC 10 card (Relay Output Card). The ION controller utilizes a 4x20 Character backlit LCD display with a membrane keypad for the operator interface. The main controller has two communication ports which allow the unit to “talk” to the main databus as well a PC, Touch Panel Display, or even allow Satellite communication. The main control unit has a provision to allow a wireless transceiver card to be directly plugged into the main unit which allows simple wireless connection to either communication ports. The ION controller allows system functionality should a PC fail and also provides distributed control should one of the systems on a network fail.

Specifications

Dimensions (LxWxH): 200mm x 110mm x 61mm, 7.85” x 4.33” x 2.38”

Enclosure Rating: Nema 4X, IP66

Mounting: Mounting holes provided on enclosure, mounting pedestals available

Power Supply: 10.0–15.0VDC, Filtered and Regulated

Current Requirements: 300mA max with backlight and wireless transmitter 80mA min.

Operating Temperature: -10 -60 Deg C

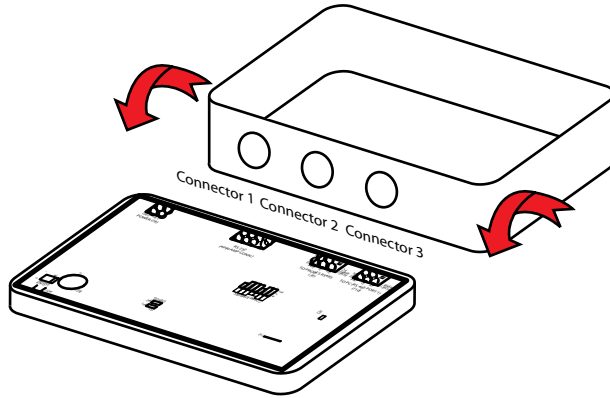
Operating Humidity: >70 % Humidity

Signal Input: Two 2 wire RS485/232 COM ports, Wireless Card Optional

Interface: 8 Button membrane keypad w/ two LED indicators

LCD: 4x20 Character LCD w/ LED Backlight

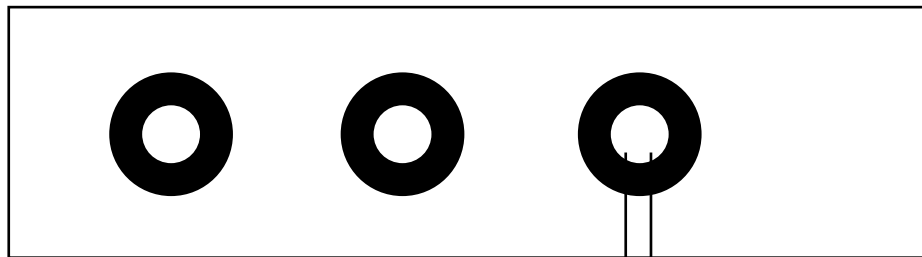
Component Wiring: ION



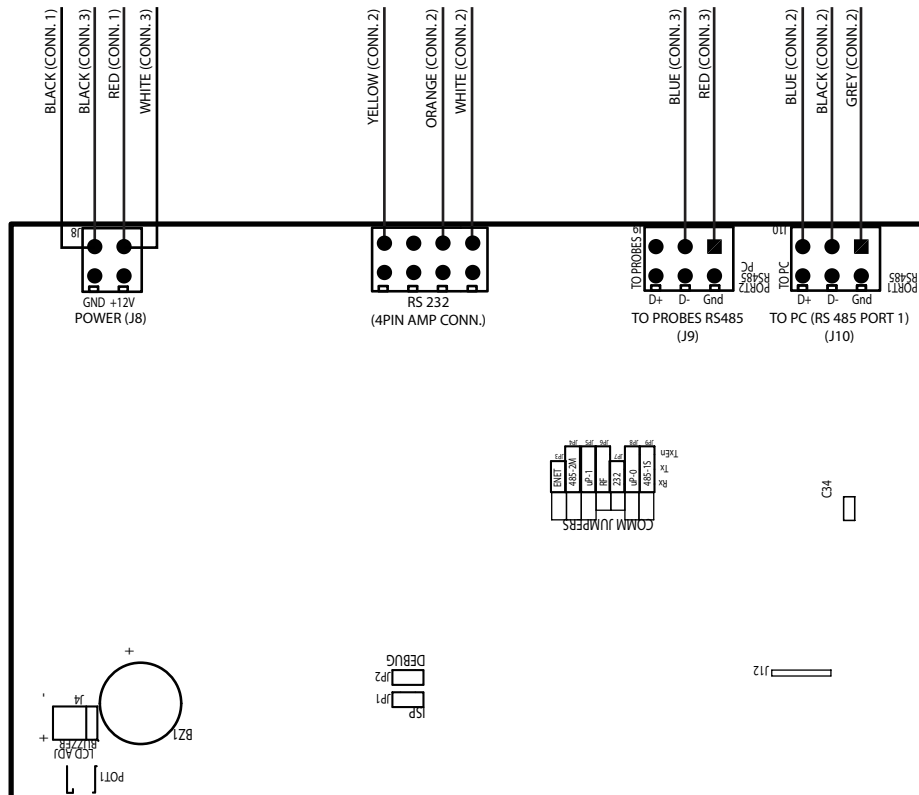
Connector 1

Connector 2

Connector 3



View from inside ION Box



System Operation

ION Controller Navigation

Turning the System ON

Note: Before powering up the ION system for the first time make sure that all necessary items are connected. [System Power / Probe Inputs / Data Connections]

Note: ION systems can be configured 2 ways:
Auto start = On/Off button is disabled, automatically powers On when power is supplied.
Standard On/Off Start = On/Off Button is active to power the main unit.

For Standard On/Off starting procedures press and hold the power button for 1 sec.

The ION welcome menu will be shown displaying the software revision number and unit serial number.

The ION will then search for connected probes. When a probe is detected the ION will display "OK" or "NOT FOUND" if there is an error. At the end of this procedure the total number of probes found will be displayed.

Operating Screen

After the ION has performed the load and detect procedure, the ION displays the Operating Screen, which displays each probe and their corresponding measured variables.

Users can manually scroll through each probe by toggling [Up and Down] with the arrows keys, or selecting Autoscroll from the Setup Menu to each probe to cycles on screen every 15 secs.



```
PT4 ION
INPUT OUTPUT NETWORK
REV ION_1
S/N 200801310001
```

```
PT4 ION
INPUT OUTPUT NETWORK
FINDING PROBES: 1/5
OK
```

```
PT4 ION
INPUT OUTPUT NETWORK
5 OF 5 FOUND
```

```
OXYGEN TANK ID#3
OXY 9.9 mg/L
WTEMP 20.9 DEG C
```



Main Menu

By pressing the [Menu] button from the Operation Screen, users can access the Main Menu to change system setting and perform various features.



Calibrate Menu

The first folder of the Main Menu screen is the Calibrate, this function is used to calibrate probe(s) within the system.

Note: As each type of Smart Probe has its own calibration procedure, refer to the specific probe calibration sections of this manual located under each probe.

Note: PT4 Smart Probes come factory calibrated and only require minimal maintenance check. For service work or factory recalibration return your probes to Point Four Systems.

```
MAIN MENU
*CALIBRATE   SETUP
CONTROL      EXT CHS
LOGGER
```

Control Menu

In order to provide maximum flexibility the PT4 ION control system uses a system of control blocks linked to designated inputs for activation of relays to control items such as alarms, solenoid valves, lighting and feeders. Typically “linking” is performed at the factory when the system is originally built. Items such as set points and delay times can easily be changed on the fly via the on screen interface.

To access the Control Setup select [Control] from the Main Menu, press [Enter]

The CONTROL SETUP menu gives you two options:

View/Edit Set points:

Used to change an alarm or control set point. Also used to configure delay Hysterisis values.

or

Output Block Setup:

****Warning for Advanced User**** Modifying these setting can have a detrimental effect on alarms and control. This function should only be performed by qualified personnel.

The purpose of the Output Block Setup is setup linking between sensor inputs and relay outputs. It also contains selections for type of control.

```
MAIN MENU
CALIBRATE   SETUP
*CONTROL     EXT CHS
LOGGER
```

```
BLK:1      OUTID#1: R#01
ID#:1 OXY M6/L      PI
SP: 8.0      FS: 20.0
P: 10.6      t: 0.70
```

```
CONTROL BLOCK 1
OUTID#: 1 R#: 1
ID#: 1
TYPE: PI
```

To access the [View/Edit Setpoints] menu use the Navigation keys to select the text and press [Enter].

```
CONTROL SETUP
*VIEW/EDIT SETPOINT
OUTPUT BLOCKS  SETUP
```

The Display will look like this:

```
BLK:1   OUTID#1 : R#01
ID#: 1:OXY  MG/L   vcn
Hi: 10.0   DELON: 1
Lo: 7.0    DELOFF: 1
```

BLK: 1 – Control block number you are programming
OutID#1 – Relay Card # the control BLK is utilizing (1-5)
R#01 – Relay in which output is linked (1-10)
ID# - Probe input ID# which BLK is linked (1-10)
OXY mg/l – Type and Engineering unit on particular probe ID
^AL – Control Function Selected
Hi: - Upper Set point
Lo: - Lower Setpoint
Del On: - Time in (sec) to trigger/reset condition
Del Off: - Time in (sec) to trigger/reset condition

Using the navigation keys to select which output block you wish to View/Edit the setpoints then press [Enter].
You will notice a *cursor appears. Select the corresponding value you wish to change and press [Enter].
To return to the block selection menu press [Esc].

QUICK REFERENCE FUNCTIONAL CHECK SETPOINTS & RELAY OUTPUTS
Follow procedures for probe calibration (see pg 13). Do 1 pt calibration, but enter lower or higher value than setpoint value in order to force output relay to switch.
NOTE: When functional test has been completed remember to carry out normal calibration procedure to correct the DO reading!

Output Block Setup

To access the [Output Block Setup] menu use the Navigation keys to select the text and press [Enter].

```
CONTROL SETUP
*VIEW/EDIT SETPOINT
OUTPUT BLOCKS  SETUP
```

A warning stating ** Consult manual before changing any settings ** will appear for 3 seconds.

```
!! CAUTION !!
CONSULT MANUAL
BEFORE CHANGING
ANY SETTING
```

The Display will give you two options:

Enter # of Blocks – Used to add or modify the total number of control blocks (50 max)
Link Blocks – Used to link input channels to output relays

```
CONTROL SETUP
*ENTER # OF BLOCKS
LINK BLOCKS
```

To enter the # of Blocks select the text using the navigation keys
Enter a value between 0-50. [0 being no control]

```
CONTROL SETUP
*ENTER NUMBER OF
CONTROL BLOCKS: █
```

To access the [Linked Blocks] menu use the Navigation keys to select the text and press [Enter].

```
CONTROL SETUP
ENTER # OF BLOCKS
*LINK BLOCKS
```

The Display will look like this:

```
CONTROL BLOCK      1
OUTID# 1 : R# 1
ID#: 1:OXY  MG/L
TYPE: ^AL
```

CONTROL BLOCK 1 – This is the Control Block number you are configuring
OutID#1 – Relay Card # the control BLK is utilizing (1-5)
R#01 – Relay in which output is linked (1-10)
ID# - Probe input ID# which BLK is linked (1-10)
OXY mg/l – Type and Engineering unit on particular probe ID
^AL – Control Function Selected

To modify these values select the desired Control Block number and press [Enter].

Using the navigation keys select desired values and press [Enter] to save the value.

To return to the Main Operating Screen menu press [Esc].

Logger Menu

The data logging function of the PT4 ION allows users to record probe measurements for future analysis or quality tracking.

The log interval set in the Data Logging Settings, Logger Setup sub-menu, is used to determine the frequency in which the data is stored to the logger. Values are captured as a “snapshot” set by the log interval.

When data is downloaded from the ION logger, a new header is transmitted along with the logged data. The header and data stream appears on the PC screen as follows:

```
POINT FOUR SYSTEMS
PT4 ION Logger Data
Log interval (sec): 10
Logging Started (YY-MM-DD HH:MM:SS):,08 01 21,16:18:25
Logging Ended (YY-MM-DD HH:MM:SS):, 08 01 24,00:00:00
No of records:., 568
Printed at (YY-MM-DD HH:MM:SS):,08 01 21,16:42:19
Time,CH1,CH2,CH5,CH6,
hh:min:sec,mg/L,mg/L,DegC,DegC,
16:18:25,10.0,8.5,10.0,0.0,
46:6:65,0.0,21.7,22.0,10.0
```

To setup Logger press [MENU], select [LOGGER] and press [ENTER].

```
LOGGER : OFF
LOGGER SETUP
*SET CLOCK
```

Set Clock

Select [Set Clock] and enter the year/month/ day/ hour/sec by using the navigation arrows, pressing [ENTER] to move to the next variable. Press [ENTER] to return to the [Logger Setup] menu.

```
LOGGER SET CLOCK
YEAR: 8
MONTH: 1
DATE: 12
```

Logger: setup

Next toggle up to [Logger Setup] and press [ENTER] go to the [LOG Setup Rate] screen to set your desired log rate. Use the navigation arrows to set the rate (defined in seconds) and press [ENTER] to return to the [Logger Setup] menu.

*Note: The minimum log rate is 10 seconds.

```
LOGGER SETUP
LOGGER: OFF
*LOGGER SETUP
SET CLOCK
```

```
LOGGER SET RATE
ENTER LOG RATE
(10 SEC MINIMUM)
!!
```

Logger: ON/OFF

Select [Logger: OFF] and press [ENTER] to turn the Data Logger On and Off.

Pressing the [UP] arrow will turn the Logger On, before the ION begins logging it will warn that previous data will be erased.

To stop logging data press the [UP] arrow, datalogging will now be paused. Press [Down] arrow to continue, or to restart a new datalog (erasing previous logged data) press [Up].

```
LOGGER SETUP
*LOGGER: OFF
LOGGER SETUP
SET CLOCK      DUMP
```

```
LOGGER ON/OFF
LOG : OFF ^ = START = V CNT
END AT: 08 02 10:20
RECORDS: 6 / 10
```

```
LOGGER ON/OFF
!! STARTING LOGGER
WILL ERASE ALL LOG
DATA.      ENTER = START
```

Once the Datalogger is On, press [Esc] 3 times to return to the [Main Operation Screen]. The datalogger will remain On until logging period is finished or if Paused or turned Off by selecting [Logger: Off] from the [Logger Setup Menu].

```
LOGGER ON/OFF
LOG: ON (UP=STOP)
STARTED: 08 01 10:20
RECORDS: 8 / 10
```

Dump

To save logged data from the ION to a computer or external media (i.e. flash drive, CD) select [Dump] from the [Logger Setup Menu] and press [ENTER].

From the this menu press [ENTER] to begin the dump procedure.

*Note before using the [Dump] procedure make sure your ION is connected to the computer, follow the detailed instructing ahead to do so.

```
LOGGER SETUP
LOGGER: OFF
LOGGER SETUP
SET CLOCK      *DUMP
```

```
LOGGER DUMP
ENTER = START
ESC = ABORT
```

```
LOGGER DUMP
DUMP DATA .....
DONE
```

Follow the procedure below to connect the ION to your computer to setup the Data Logging function.

Step 1

There are 2 ways to connect the ION to your computer: DB9 or USB

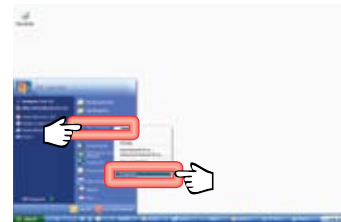
The DB9 connector is usually located on the rear of the computer.



To connect via USB connector, follow the driver installation manual on the USB connector CD and continue this installation procedure below at Step 2.

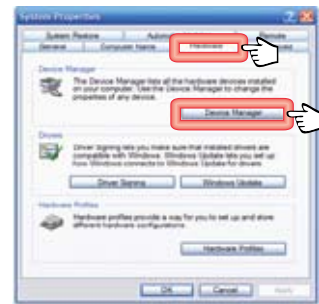
Step 2

Check which [COM Port] is being used:
Right Click on [MY COMPUTER]
Click [PROPERTIES]



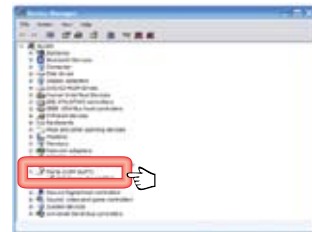
Step 3

Select the [HARDWARE TAB]
Click [DEVICE MANAGER]



Step 4

Click [PORTS] (COM & LPT)
Take note of the COM number.
This will be specific to your computer.
Exit [Device Manager]



Step 5

Setting up the Hyper Terminal Open the Hyper Terminal Folder:
Click [START]
Select [ALL Program]
Select [ACCESSORIES]
Select [COMMUNICATIONS]
Click [HYPER TERMINAL]



Step 6

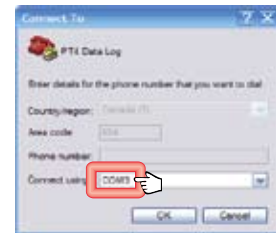
When Connection Description box appears:
ENTER NAME(e.g. PT4 Data Log) SELECT the [TELEPHONE ICON] for the connection Your communication settings will reside in this file.
Click [OK]



Step 7

When the Phone Number box appears select the correct [COM PORT] that is connected to the ION. Click [OK]

This [COM PORT] now represents the cable connection to the ION.



Step 8

Under [COM "#"] Properties Window Select the following values:

BITS PER SECOND OPTION to [9600]

DATA BITS to [8]

PARITY to [EVEN]

STOP BITS to [1]

Select [NONE] for FLOW CONTROL

Click [OK]



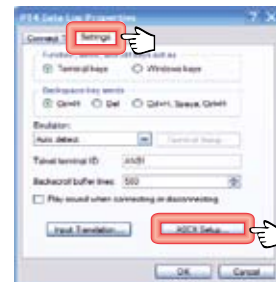
Step 9

Under the [FILE] MENU

Select [PROPERTIES]

Click [SETTINGS]

Click the [ASCII SETUP] BUTTON

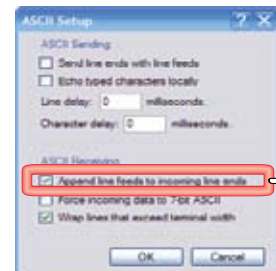


Step 10

Under the [ASCII SETUP] MENU check off [APPEND LINE FEEDS TO INCOMING LINE ENDS]

All other settings remain the same (default).

Click [OK]



Step 11

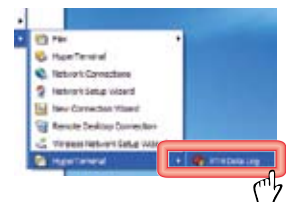
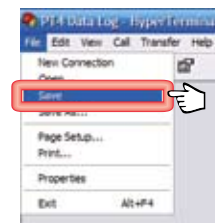
Save this connection by selecting [FILE] from the main pull down menu.

Select [SAVE]

The above settings are retained when the [SAVE] option is executed.

This completes the setup procedure.

When launching the [Hyperterminal] for future use (see Step 5), this saved connection configuration file will now be present beside the Hyperterminal launch button.

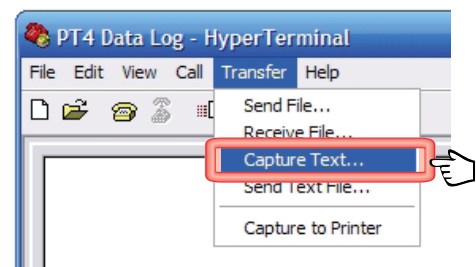


Step 12

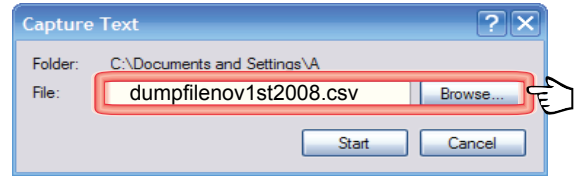
Capturing Data under Hyper Terminal

Click the [TRANSFERS] MENU

Select [CAPTURE TEXT FILE]



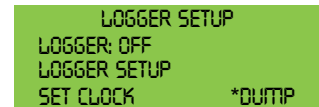
Step 13
Click [BROWSE]
Name the file to be saved with the file extension
“.csv”
Click [START]



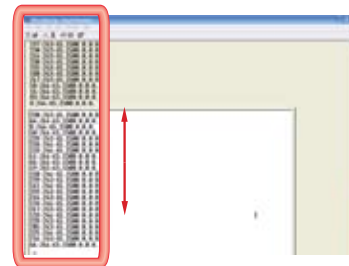
Step 14
Next turn on the ION, wait to initialize.



Step 15
To enter DATALOGGING Program:
Press [MENU]
Select [LOGGING] and press [ENTER]
Select [Dump] from the [LOGGER SETUP MENU]
and press [ENTER]
Press [ENTER] to preform data dump.



Step 16
Your logged data should appear in the Hyper Terminal Window. When logger is finished, close the Hyper Terminal Window.



Step 17
To Close the Hyper Terminal Folder:
Select [FILE] from the main pull down menu
Select [SAVE]
Select [Exit] from the [File] menu
When prompted “Do you want disconnect now?”
Select “Yes” in the Disconnection Box

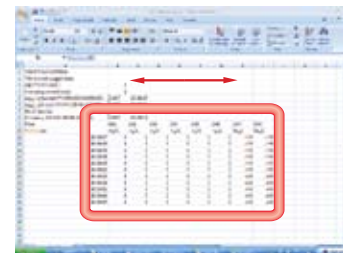


DumpFileFeb1st2008.csv

Step 18
To View Logged Data:Open the captured text file
from the Hyper Terminal as saved in a specific
location on your computer (see Step 13).

Step 19
The data will open in a Microsoft EXCEL
Spreadsheet. Adjust the columns width of the
spreadsheet to align the data properly.

* Note: If your system is not equipped with microsoft
excel, a trial version can be downloaded at: [http://
office.microsoft.com/en-us/excel/default.aspx](http://office.microsoft.com/en-us/excel/default.aspx)



Backlight

Control for the backlight can be accessed by pressing the [Menu] button / press the [Right] arrow to select [Setup] / then press [Enter]

Under the Setup Menu press [Enter] to select [Backlight]

Pressing the [Up or Down] arrows users can configure the back light to:

(always) ON / (always) OFF / or TIMED, which allows the backlight to only come on for 1 minute when any button is pressed.

Number of Probes

If the ION does not:

- (1) detect the correct number of probes
- (2) probes are “not found”, or
- (3) probes are to be added or removed from the system, users can check and configure probe settings from the Number of Probes section of the Setup Menu.

From the main screen press the [Menu] button / toggle to Setup Menu / press [Enter]. Toggle down to Number of Probes / press [Enter].

By pressing [Up or Down] users can configure the number of probes in the system. Press [Enter] to continue to the Set Probe screen.

Set Probe

The Set Probe screen allows users to toggle between the number of probes, press [Up or Down] to Enable or Disable the probes from the system, when complete pressing [Enter] will select your option and exit the menu.

Autoscroll

The Autoscroll function allows all probe channels and their corresponding measured variables to be scrolled every 15 seconds on the Main Screen.

Select Autoscroll from the Setup Menu / then press [Enter]. Toggle [Up and Down] to turn Autoscroll [On or Off] / pressing [Enter] will select your option and exit the menu.

Beep

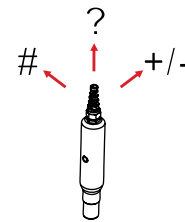
The Beep option controls if a sound is made every time a button is pressed.

From the Setup Menu select [Beep] / Toggle [Up and Down] to turn the Beep option [On or Off] / pressing [Enter] will select your option and exit the menu.

```
MAIN MENU
CALIBRATE      *SETUP
CONTROL        EXT CHS
LOGGER
```

```
SETUP MENU
*BACKLIGHT
NUMBER OF PROBES
AUTOSCROLL     BEEP
```

```
SETUP MENU
BACKLIGHT: TIMED
```



```
SETUP MENU
BACKLIGHT
*NUMBER OF PROBES
AUTOSCROLL     BEEP
```

```
SETUP MENU
SET NUMBER OF PROBES
NUMBER OF PROBES: 6
```

```
SET PROBES
Y = ENABLED  N = DISABLED
1 2 3 4 5 6
Y Y Y Y N Y
```

```
SETUP MENU
BACKLIGHT
NUMBER OF PROBES
*AUTOSCROLL     BEEP
```

```
SETUP MENU
AUTOSCROLL : ON
```

```
SETUP MENU
BACKLIGHT
NUMBER OF PROBES
AUTOSCROLL     *BEEP
```

```
SETUP MENU
BEEP : ON
```