

***4100P***  
**SIDE SCAN TOPSIDE  
PROCESSOR**

***USER'S MANUAL***

***Revision: 1.3 /June, 2007***



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## WARRANTY

All equipment manufactured by EdgeTech is warranted against defective components and workmanship for a period of one year after shipment. Warranty repair will be done by EdgeTech, free of charge. Shipping costs are to be borne by the customer. Malfunction due to improper use is not covered in the warranty and EdgeTech disclaims any liability for consequential damage resulting from defects in the performance of the equipment. No product is warranted as being fit for a particular purpose and there is no warranty of merchantability. This warranty applies only if:

- i. The items are used solely under the operating conditions and in the manner recommended in Seller's instruction manual, specifications, or other literature.
- ii. The items have not been misused or abused in any manner or repairs attempted thereon.
- iii. Written notice of the failure within the warranty period is forwarded to Seller and the directions received for properly identifying items returned under warranty are followed.
- iv. The return notice authorizes Seller to examine and disassemble returned products to the extent Seller deems necessary to ascertain the cause for failure.

The warranties expressed herein are exclusive. There are no other warranties, either expressed or implied, beyond those set forth herein, and Seller does not assume any other obligation or liability in connection with the sale or use of said products. Any product or service repaired under this warranty shall be warranted for the remaining portion of the original warranty period only.

Equipment not manufactured by EdgeTech is supported only to the extent of the original manufacturer's warranties.

## WARNING

This equipment contains static sensitive devices that are extremely sensitive to static electrical charges, which may be developed on the body and the clothing. Extreme care should be taken when handling these devices both in and out of the circuit board. Normal handling precautions involve the use of anti-static protection materials and grounding straps for personnel.

This equipment generates, uses and can radiate radio frequency energy, and if not installed properly may cause interference to radio communications. It has not been tested to compliance to the appropriate FCC rules designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user, at his own expense, will be required to take whatever measures needed to correct the interference. It is the user's responsibility to verify that the system complies with the applicable FCC emission limits.

High Voltage may be present in the towfish, power amplifier and the topside processor. Use caution when the electronics are removed from their containers for servicing.

Operation with improper line voltage could cause serious damage to the equipment.

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# EdgeTech 4100P User's Manual

## 1. Introduction

The 4100P Portable Topside Processor provides an interface between a laptop computer running EdgeTech's DISCOVER 4100 Side Scan Sonar acquisition software, and a Model 272-TD towfish. The end user need only supply a source of GPS data and either AC or DC power to complete the acquisition package. The complete system with the 4100P and 272-TD is the Model 4100 Side Scan Sonar System.

The 560P unit is a self contained, portable unit with all interface and power supply electronics housed within a rugged, waterproof (when the lid is closed) Storm<sup>®</sup> case. There is space inside the closed unit to accommodate an EdgeTech supplied laptop personal computer.

The data and control interface between the laptop and the 4100P is via TCP/IP protocols and may be via wireless or direct cable connections.

## 2. Overview

### 2.1. Product Specifications

#### Physical:

Size	39 cm D x 49 mm W x 19 mm H (15.2 in x 19.2 in x 7.3 in)
Weight	13.2 kg (29.0 lbs.) w/ laptop 10 kg (22.0 lbs.) w/o laptop
Construction	High-impact structural polypropylene
Color	Yellow
Sealing	Watertight cover O-ring seal, w/purge valve

#### Power requirements:

DC Input voltage	11 to 30 VDC 60 watts maximum 3 Amps at 12 VDC 2 Amps at 24 VDC
AC Input	120/240 VAC 80 watts maximum (Auto-ranging) 0.6 Amps at 120 VAC 0.4 Amps at 240 VAC

**Environment:**

Temperature range:	
Operating:	0°C to 40°C (32°F to 104°F) (shade conditions)
Storage:	-20°C to 60°C (-4°F to 140°F)
Relative humidity:	
Operating:	0 to 80% (non-condensing)
Non-operating:	0 to 100%

**Tow-Fish Interface:**

Data Input:	EdgeTech model 272-TD, 2-channel analog side scan, either 100 or "500" kHz.
Towfish Power:	+750 to +800 VDC

**4100P/Laptop Processor Interfaces:**

1. Direct Ethernet Connection (10BaseT, TCP/IP)
2. Wireless Ethernet (802.11b)

**Laptop Specifications:**

Due to continuous product evolution in this area a firm specification cannot be provided. The nominal specification for the EdgeTech supplied laptop is:

Notebook computer	: Sony Vaio-FS540P, or equivalent
Operating System	: Windows XP Professional
Processor	: Pentium M 730, 1.6 GHz
Memory	: 512 Mbytes
Hard drive	: 80 GBytes
Screen size	: 15.4" - 1280 x 800 typical
Wireless	: Intel® Centrino™

**Supplied Components:**

4100P Portable Processor case with integral interface electronics  
Laptop processor with DISCOVER 4100 Side Scan Sonar acquisition software  
System Recovery Disk  
AC power cable  
DC Power & Ethernet cable  
Spares Kit  
Manuals

## 2.2. Operational Overview

### 2.2.1. Item descriptions

#### 4100P Portable Processor Case

The processor case supplied is based on the Hardigg Storm® case series, and provides a waterproof enclosure of the 272-TD Towfish power supply and interface electronics. The power, towfish and Ethernet cable connectors are mounted on a recessed, waterproof panel, with LED indicators and On/OFF switch.

#### Laptop processor

The laptop style processor is used to run EdgeTech's DISCOVER 4100 Side Scan Sonar software acquisition package. This provides control, storage and display of the towfish data. The data is presented on a color waterfall display and is stored in XTF or JSF formats on a hard disk. (See <http://www.edgetech.com/topsidelevel3discover.html>) A user supplied GPS with NMEA interface strings is required for positioning data.

#### AC power Cable

The supplied 2 meter AC power cable, shown in Figure 8, is used to connect the unit to a source of AC power. The source may be 50/60Hz and either 120 or 240 volts (nominal).

#### DC Power & Ethernet Cable

This 7.6m (25') long cable, shown in Figure 9, is used to supply either one or both of the following functions:

- DC power for the unit. (Typically for battery powered installations)  
YELLOW wire is positive, BROWN wire is negative  
or  
Red wire is Positive, Black wire is Negative
- Direct Ethernet 10BaseT connection to the Laptop.

NOTE: AC or DC power may be connected simultaneously or individually.

#### 272-TD Tow Cable Adapter

This is supplied for installations where the EdgeTech 272-TD standard 7 Pin Amphenol tow cable is used for connection to the towfish. It provides the connector type changeover necessary (see Figure 10).

*NOTE: In this case the tow cable is NOT waterproof at the Male/Female Amphenol connection point, and this should be suitably protected in wet environments/installations. A direct 4100P – towfish cable assembly is recommended for wet installations.*



### 3. Installation and Connecting the System

#### 3.1. Setup

1) Check the unit is OFF.

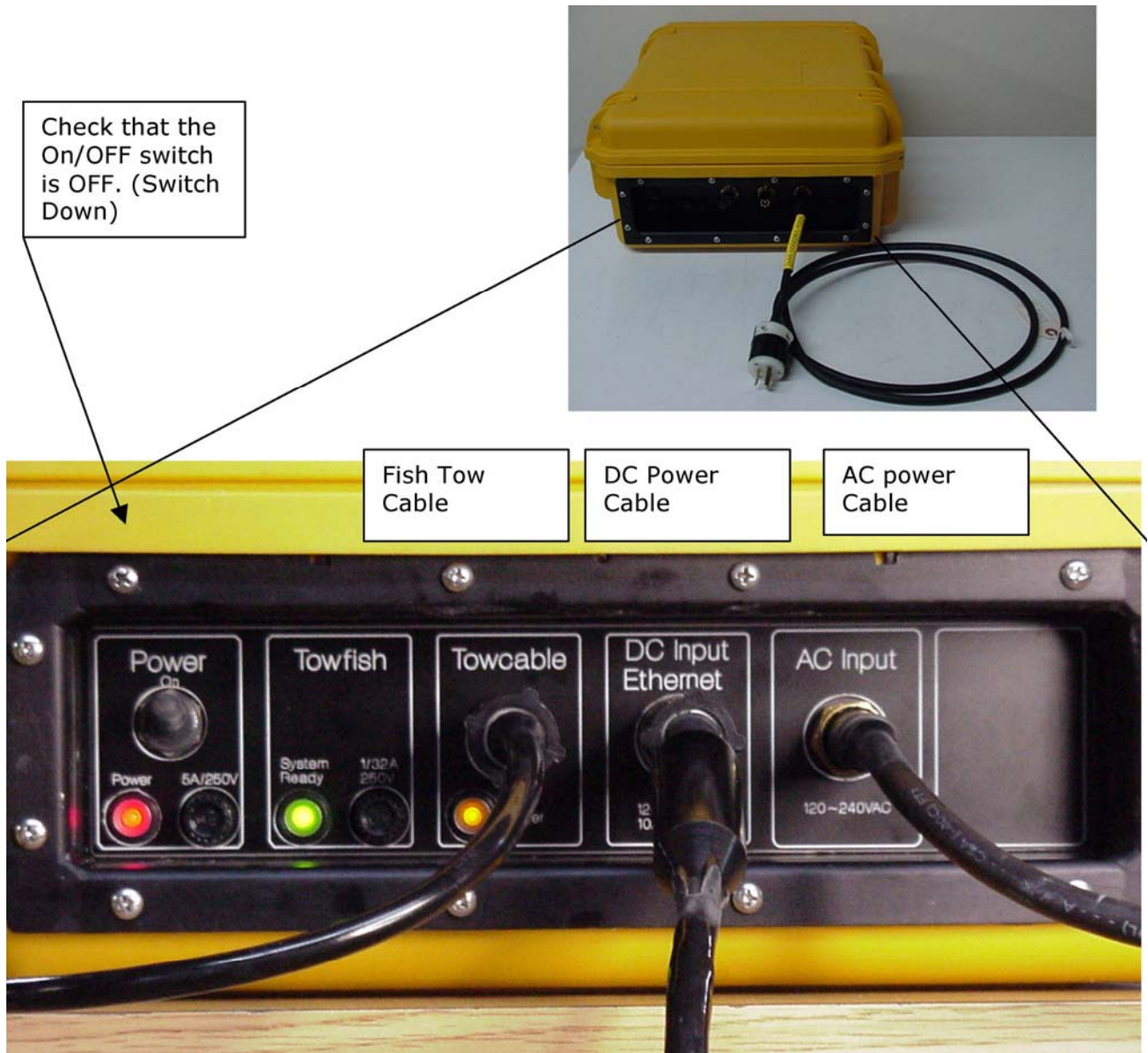
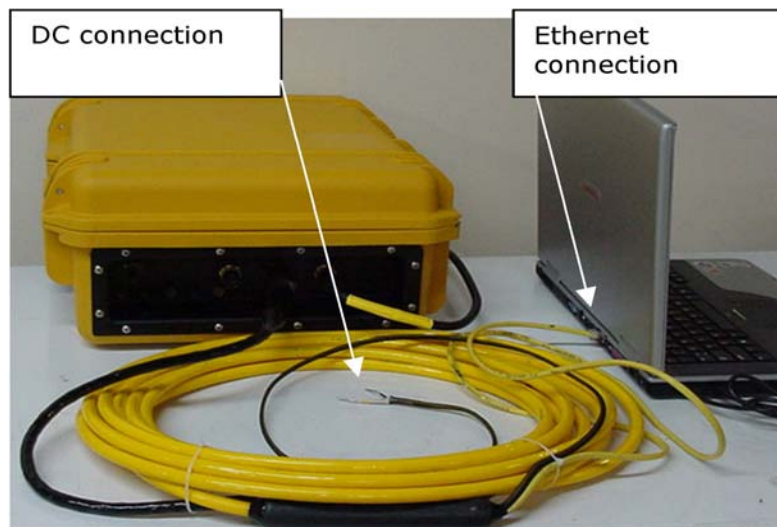


Figure 1 - Interface Panel

- 2) Connect the 4100P unit to a source of AC and/or DC power using either the DC & Ethernet cable or the AC power cable. (Check system power specifications)
- 3) Connect the 4100P via the tow cable connection to the towfish using either the supplied adapter or a direct cable connection.
- 4) Connect the Laptop to the 4100P unit using either the Wireless connection, or via the 10BaseT direct Ethernet cable (which is part of the DC & Ethernet cable assembly). The Ethernet cable may be extended up to 100 feet using a Category 5 Ethernet patch cable and Ethernet connector. A crossover or direct cable may be used.



**Figure 2 - DC & Ethernet Cable**

- 5) Operate the ON/OFF switch to the ON position (UP).  
*NOTE: The switch operates in both the AC and DC power input modes.*  
Observe the Front Panel LEDs.  
The correct Status should be:
  - Power LED (RED) = ON
  - Status LED (Green) = ON after about 5 seconds and remain ON.  
*NOTE: The Trigger LED (Orange) = ON only when 272 towfish is transmitting.*

### **3.2. LED Diagnostics:**

- a) The RED Power LED should be always lit if power (AC or DC) is applied AND the power switch is in the ON position.
- b) If the GREEN LED goes off after 5-10 seconds, there is an internal failure that will require attention by a qualified service technician.

- c) The GREEN LED will flash On/Off about 1/2 hertz when unit is ready and **waiting** for a TCP/IP connection to DISCOVER.

If the RED LED does not operate with power applied, check the status of switch and all power connections to the unit. Also check the 5A/250V fuse (F1); replace if blown.

If the GREEN LED is flashing, check the Laptop Ethernet connections and DISCOVER 4100 status.

*Note: The GREEN LED will flash if there is a valid Ethernet link between the Laptop and the 4100P unit, but DISCOVER is not running, or is incorrectly configured. The GREEN LED will also flash if DISCOVER is running but there is no valid TCP/IP connection between the Laptop and the 560P unit.*

### 3.3. Ethernet Connections

The internal electronics of the 4100P provides a control and data interface to the towfish via TCP/IP address & socket.

The TCP/IP address of the 4100P interface hardware is FIXED at the factory at 192.9.0.101. (Socket number is 1700)

For this reason, the laptop (or any other) PC interface wishing to connect to the 4100P must use an address of 192.9.0.XXX., where XXX being any valid IP address other than 101. Factory defaults for these are 100 for the Wireless LAN and 99 for the wired LAN adapter.

*The TCP/IP connection may be made utilizing any ONE of the following methods.*

#### 3.3.1. Direct Cable Method

In this method, the TCP/IP connection is made via the DC & Ethernet cable. This has a standard RJ45 Ethernet connector suitable for direct connection to the Laptop (or desktop PC). The 4100P unit is auto-sensing for MDI or MDI-X cabling.

The following steps should be taken to use direct cable connection:

- 1) Disable the Wireless connection. (ACTION: locate the Wireless connection on desktop, right click, and disable it ..., OR if so equipped, Turn OFF the Wireless function on the Laptop (a Blue LED/button on Compaq Presario X1000).
- 2) Plug the RJ45 connector of the supplied DC & Ethernet cable into the LAN port of the Laptop.
- 3) Enable the LAN connection. (ACTION: Locate LAN connection on Desktop, and Enable it...).

If the LAN is NOT shown as "Connected" in the Local Area Network Properties Box, check all hardware connections, LAN IP address (see Section 4), and that the 4100P is powered on.

### 3.3.2. Wireless Method

In this method the Intel® Centrino™ wireless networking capability of the laptop will be used.

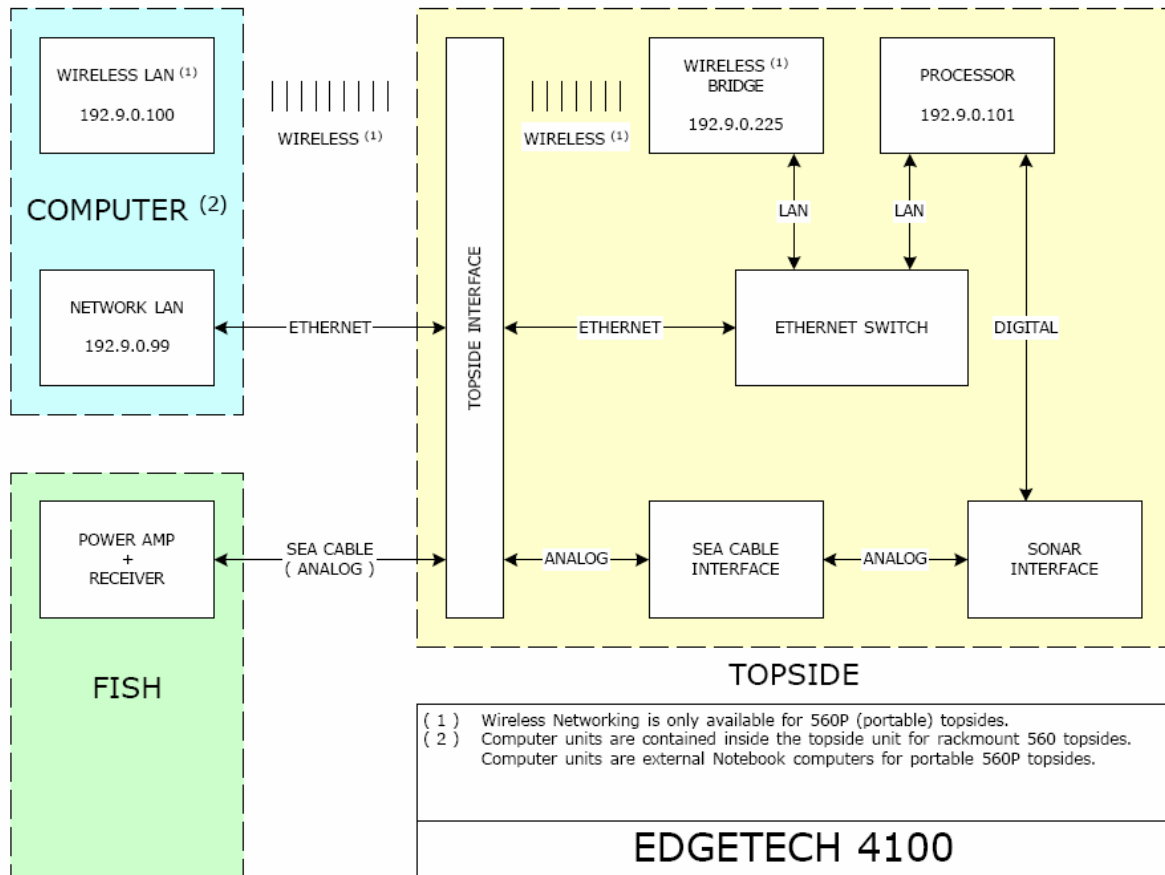
The following steps should be taken:

- 1) Disable the LAN connection of the laptop. (ACTION: Locate LAN connection on Desktop, double click, and Disable it... OR simply unplug LAN cable from laptop).
- 2) Enable the wireless connection. (ACTION: locate Wireless connection Icon on desktop, right click, and Enable ...OR if so equipped Turn ON the wireless function on the laptop ).

The wireless connection should show a valid connection to the "sonarlink" wireless network after 10-15 seconds. If there are problems with this link, refer to Section 4.

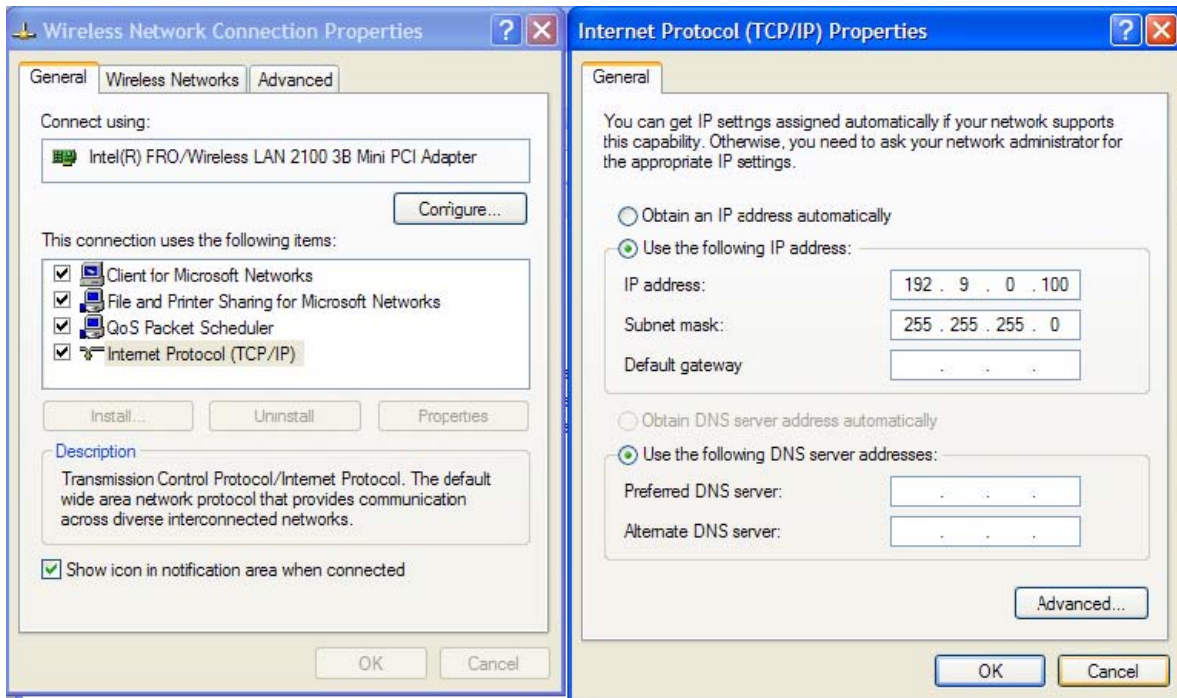
## 4. System IP address configurations

The factory supplied configurations for the laptop's wireless and direct cable network adapters are shown below.



**Figure 3 – 4100 Network Configuration Diagram**

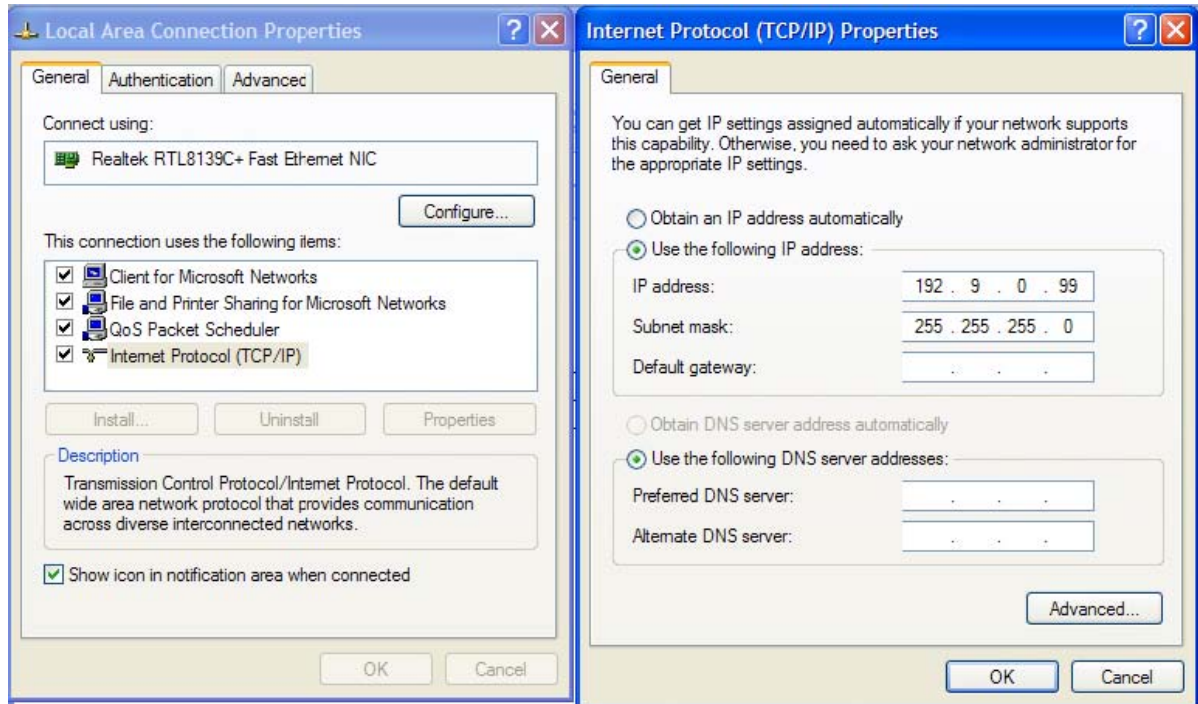
## 4.1. Wireless Network Adapter TCP/IP Address:



**Figure 4 - Wireless TCP/IP Address**

For more information on wireless setup and configuration please refer to Appendix B, "4xxxP System – Wireless Setup"

## 4.2. Local Area Network Adapter TCP/IP Address:



**Figure 5 - LAN TCP/IP Address**

The Network Adapter Media configuration can be setup for Auto or 100Mb/s link speed for short (8m) cables. For longer cables we recommend a setting of 10Mbit/s, Half Duplex mode.

## 4.3. 4100P Interface Hardware TCP/IP Address:

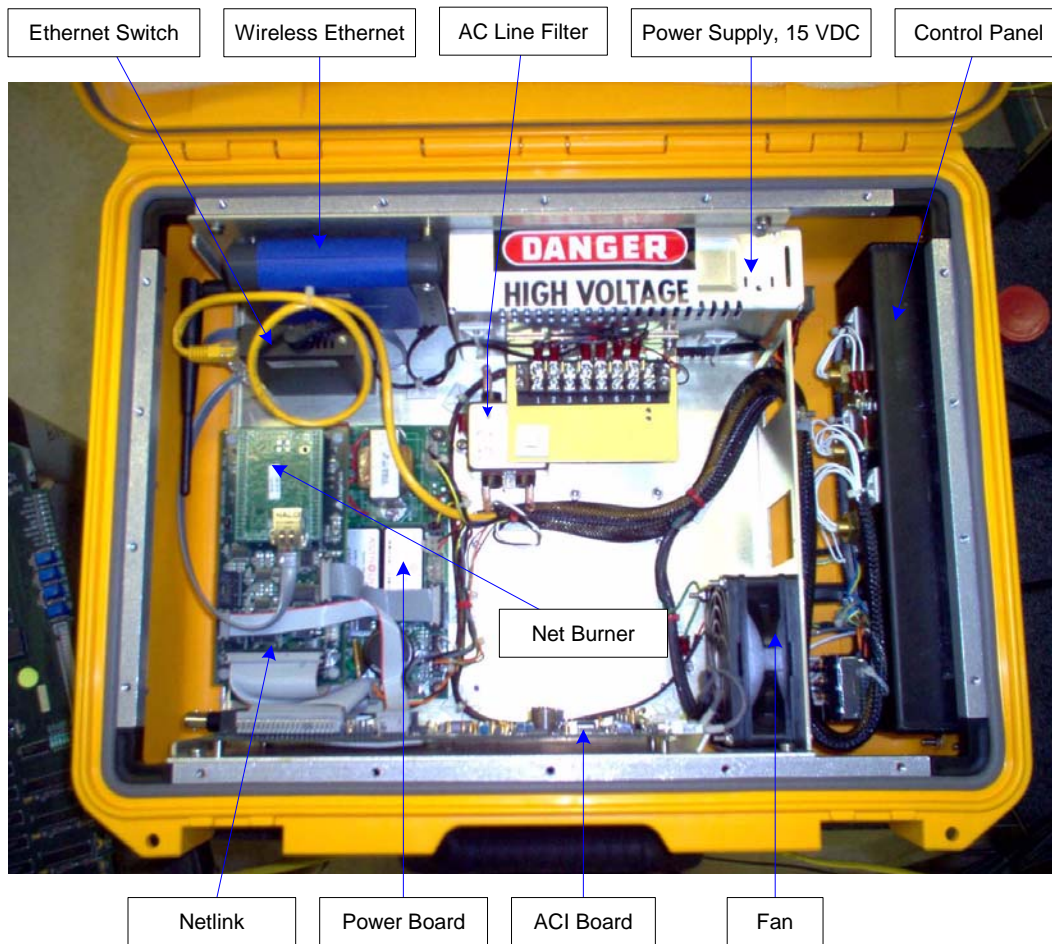
This is FIXED at 192.9.0.101.

## 4.4. 4100P Wireless Adapter TCP/IP Address

The 560P Interface unit has a built in Linksys Wireless adapter (Model WET11) . This Wireless adapter has its own TCP/IP address for configuration and status reporting (Refer to Linksys Manuals). This is set by EdgeTech at 192.9.0.255. (Note the Linksys default is 192.168.1.255). This IP address is not used during normal system operation.

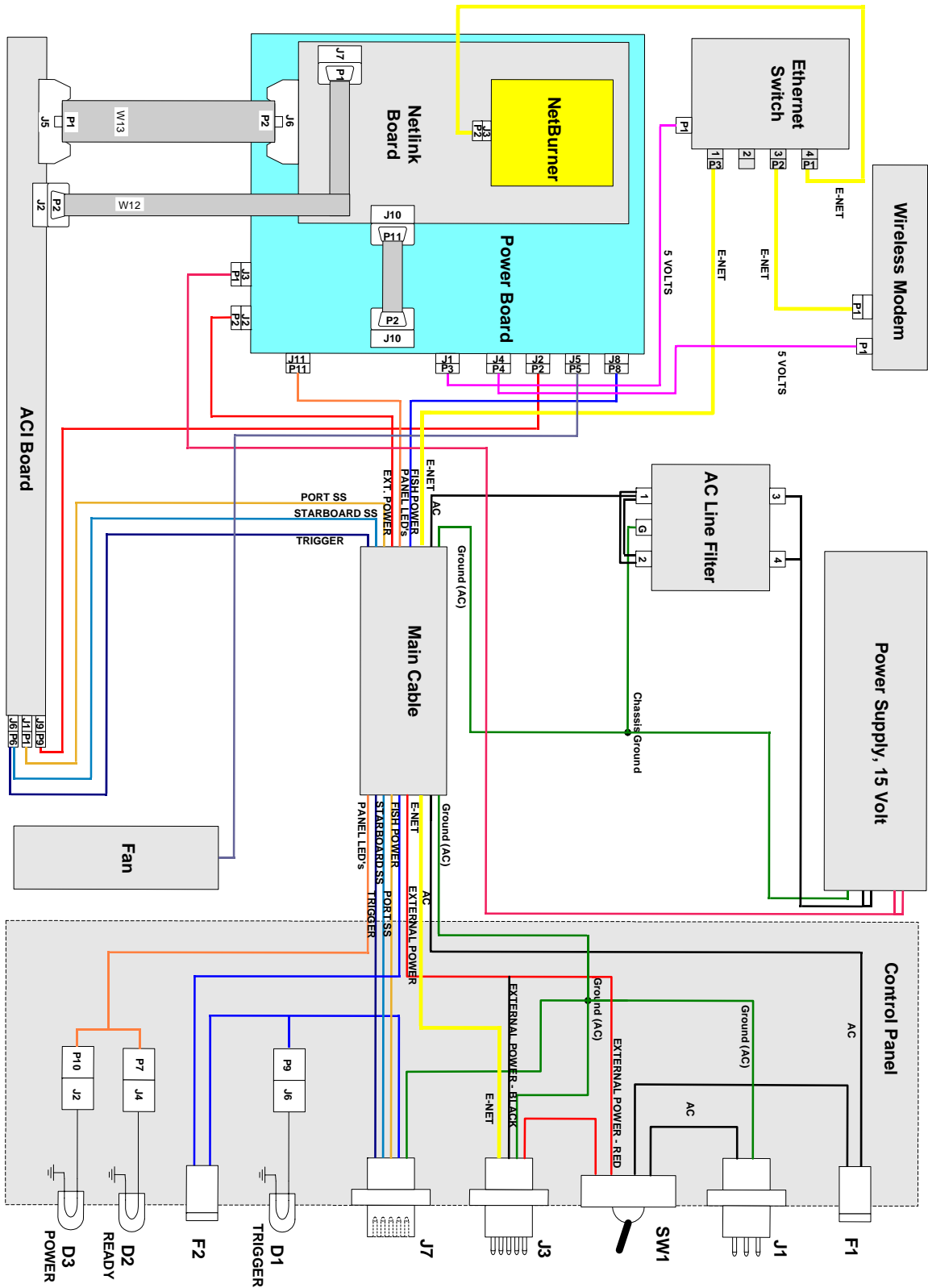
## 5. Internal Hardware

Major components of the 4100P internal hardware are shown in the picture below (Figure 5). A schematic representation of the same hardware is shown in Figure 6.



**Figure 6 - Internal 4100P Hardware**



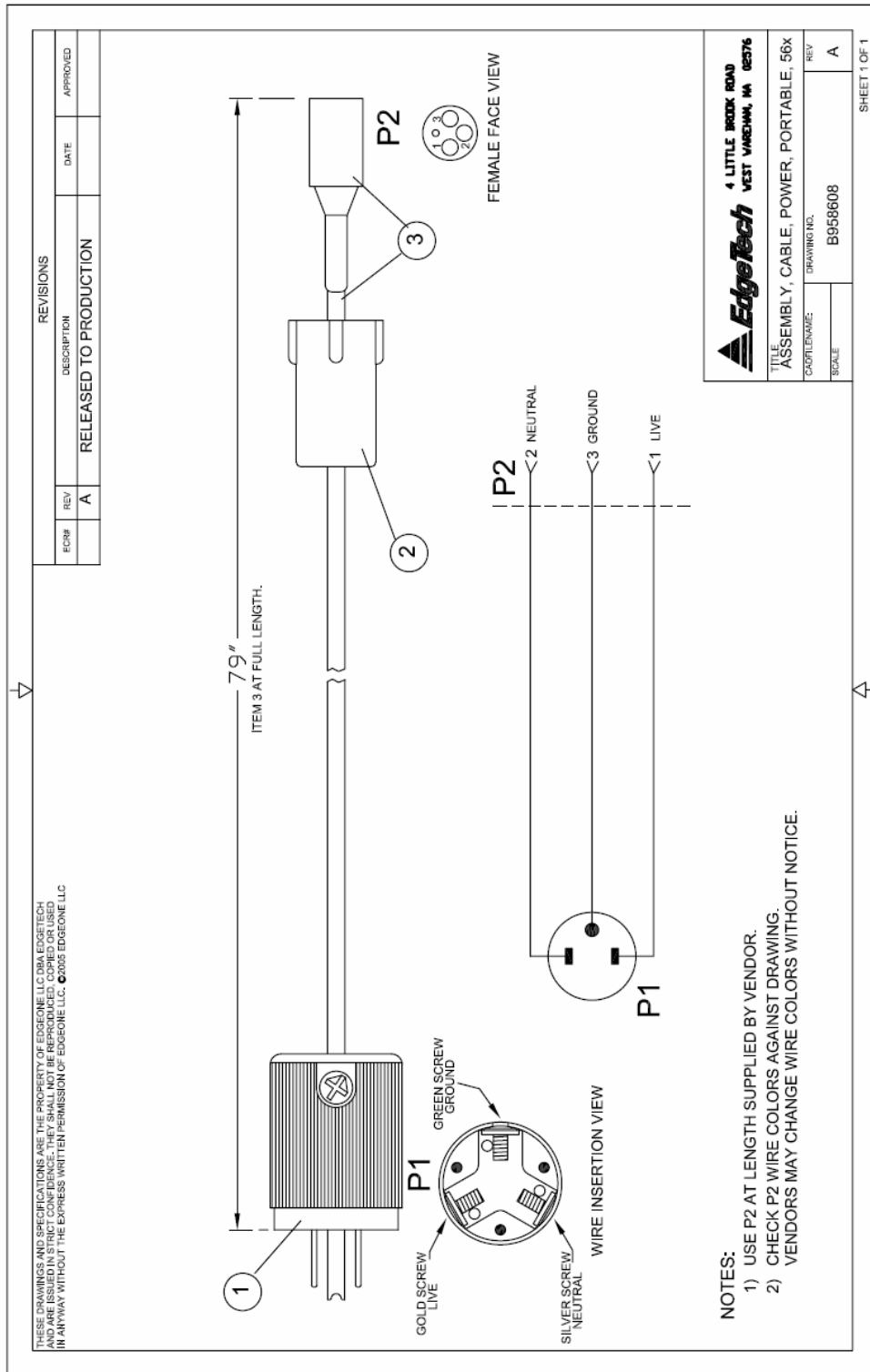


**Figure 7 – 4100P Schematic**

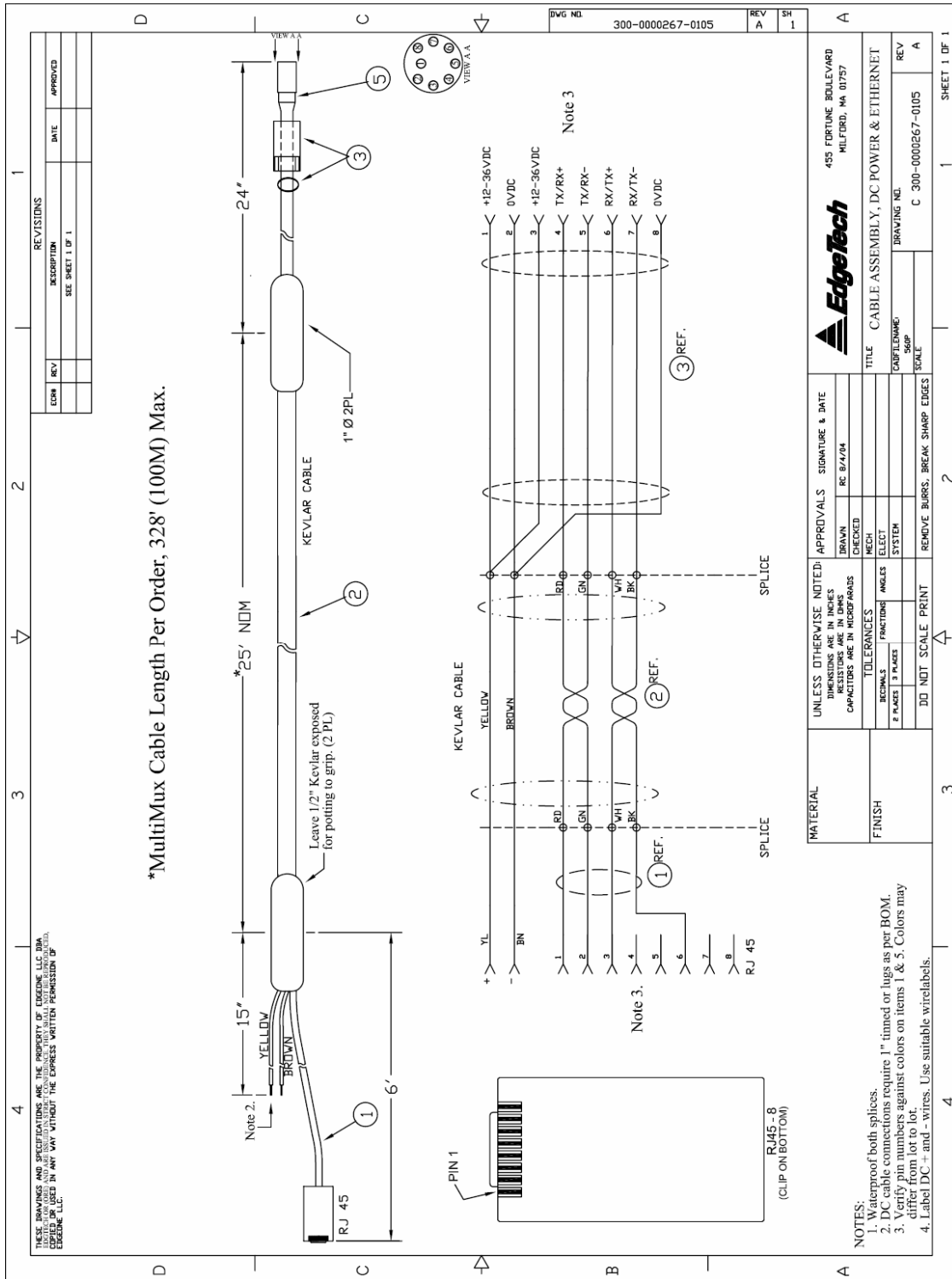
## 6. Parts List

LED, RED, SEALED, 560P	020-LGAASRD-1000
LED, GREEN, SEALED, 560P	020-LOPSHGN-1000
LED, YELLOW, SEALED, 560P	020-LOPSHYW-1000
POWER SUPPLY, AC/DC, 15V	030-0000008-1000
ETHERNET SWITCH, 4 PORT, MINI	040-0000038-1000
ETHERNET WIRELESS BRIDGE	040-0000047-1000
FILTER, LINE, 5AMP	040-000LF00-1000
CONN, BULKHEAD, 8 PIN, F, MCBH8F-B	067-F008B02-1000
CONN, BULKHEAD, 3 PIN, MALE, MCBH3	067-M003B02-1000
CONN, BULKHEAD, 8 PIN, MALE, MCBH8	067-M008B02-1000
CONN, LOCKING SLEEVE, F, 15 SHELL	067-N000L00-1015
FUSE, HOLDER, 5X20, PANEL MOUNT	070-HLDR003-1000
FAN, 12VDC, 3.62"X1.0"	099-F001P00-1000
FAN GUARD, BLK PLASTIC	100-0000072-1000
PC, LAPTOP	170-0000082-1000
FUSE, 1/32AMP, 250V, FAST-BLO	190950
CABLE, CAT. 5E, YELLOW, 3M, PORTABLE	191167
SWITCH, ON /OFF, 560P	193941
BOOT, CAP, SWITCH COVER, 560P	194042
CONN, DUMMY PLUG, MICRO, MCDC8F	194743
CONN, DUMMY PLUG, MICRO, MCDC8M	194840
CONN, DUMMY PLUG, MICRO, MCDC3F	194948
ASSY, PCB, PORTABLE POWER BOARD	200-0000092-1000
ASSY, PCB, NETLINK, ACI INTERFACE	200-0000090-1000
NETBURNER MODULE	040-NETBURN-1000
DUAL SERIAL I/O BOARD, PCMCIA1	200-0000100-1000
SCREW, PANEL, 10-32X5/8 BK SS	22810-10FCP
ASSY, CABLE, DC POWER & ETHERNET	300-0000267-1000
ASSY, ADAPTER 272 TOWCABLE, 560P	300-0000268-1000
PANEL, FRONT, 56XP, PORTABLE	350-0000275-0300
NUT, BAR, 560P, PORTABLE	350-0000420-0300
GASKET, RUBBER, 56XP, PORTABLE	350-0000421-0300
ASSY, AC POWER CORD, 560P	B958608
CASE, YELLOW, 56XP, PORTABLE	B980049
ASSY, PCB, ACI WITH EPROM	C958434

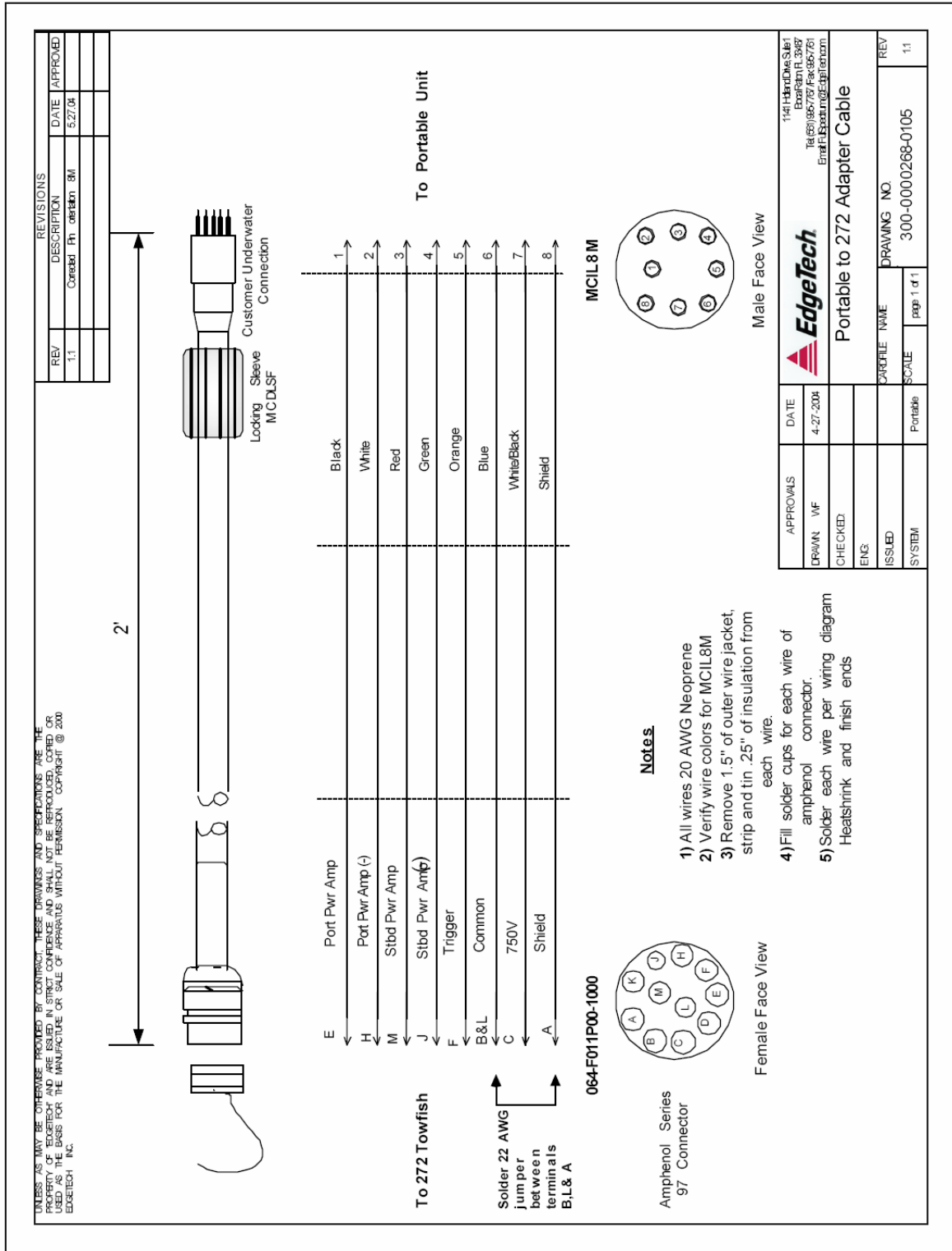
## 7. Cables



**Figure 8: AC Power Cable**



**Figure 9: DC Power & Ethernet Cable**



**Figure 10: 4100P to 272 Adapter Cable**

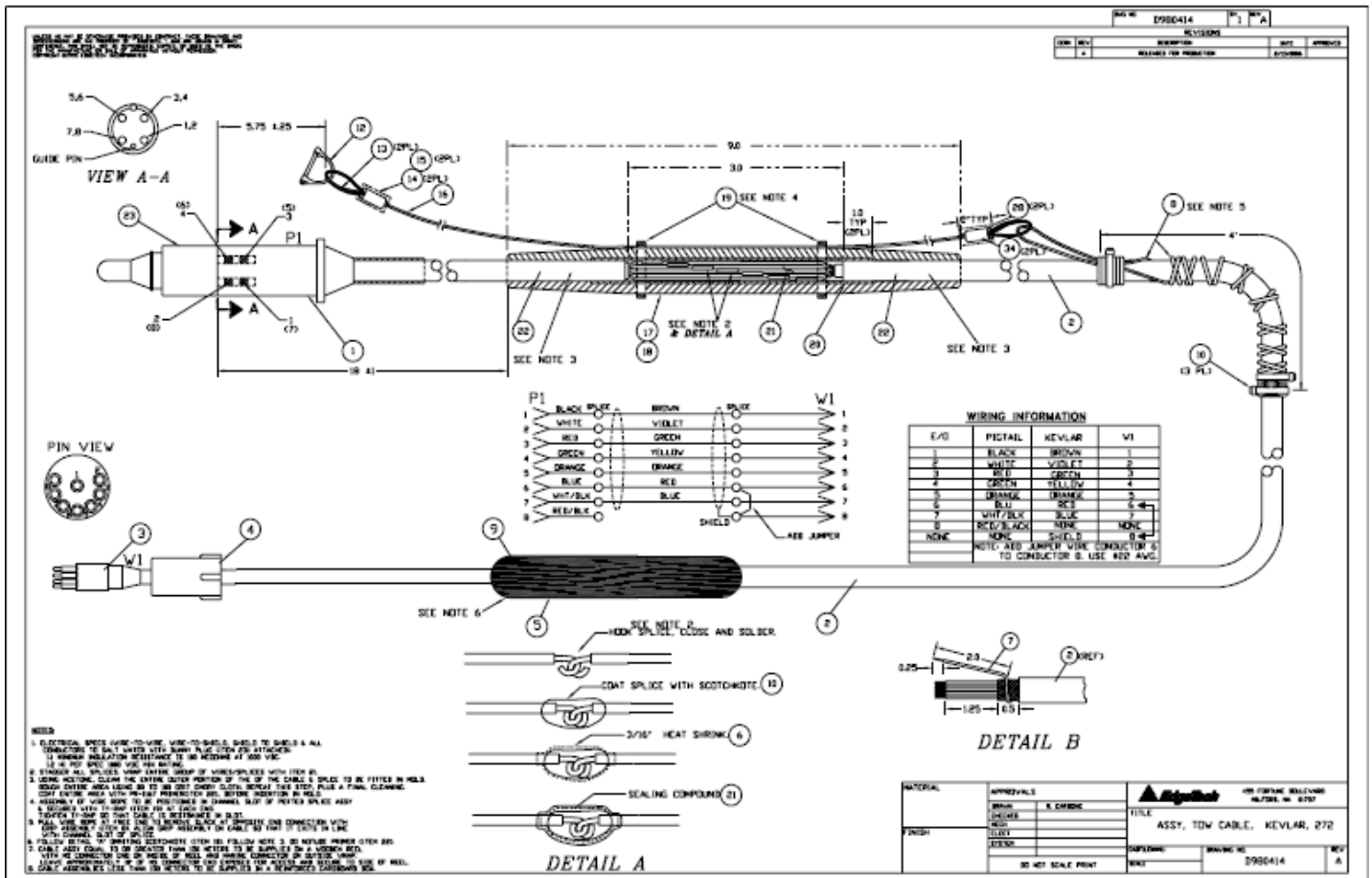


Figure 11: 4100P Tow Cable

## 8. Contact and Service Information

**For product service or support call:**

EdgeTech  
4 Little Brook Road  
West Wareham, MA 02576  
Tel: (508) 291-0057  
Fax: (508) 291-2491  
Email: [service@edgetech.com](mailto:service@edgetech.com)

If it is necessary to return the equipment for service, you must obtain a Returned Material Authorization (RMA) number prior to returning any equipment to EdgeTech. This is to assist EdgeTech in recognizing your equipment when it arrives at our Receiving dock, and to assist us in tracking your equipment while it is at our facility.

## 9. Returned Material Authorization

It is necessary to obtain a Returned Material Authorization (RMA) number prior to returning any equipment to EdgeTech. This will help EdgeTech in recognizing your equipment when it arrives at our receiving dock, and to assist us in tracking your equipment while it is at our facility. The material should be shipped to the address indicated above.

Please refer to the RMA number on all documents and correspondence as well.

All returned material must be shipped prepaid. **Freight collect shipments will not be accepted.**

The following steps apply only to material being returned from outside the Continental United States. These steps should be followed carefully to prevent delays and additional costs.

1. All shipments must be accompanied by three copies of your proforma invoice, showing the value of the material and the **reason for its return**, if the reason is for repair it must be clearly stated in order to come through customs faster and without duties being charged. Whenever possible, please send copies of original export shipping documents with the consignment.
2. If the value of the equipment is over \$1000, the following Shipper's oath must be sent with the invoice. This oath can be typed on the invoice, or on a separate letterhead.

"I, \_\_\_\_\_, declare that the articles herein specified are the growth, produce, or manufacture of the United States; that they were exported from the United States from the port of \_\_\_\_\_, on or about \_\_\_\_\_; that they are returned without having been advanced in value or improved in condition by any process of manufacture or any other means; and that no drawback, or allowance has been paid or admitted hereof."

Signed \_\_\_\_\_
3. If there is more than one item per consignment, a packing list must accompany the shipment. It is acceptable to combine the proforma invoice and packing list as long as the contents of each carton are clearly numbered and identified on the invoice.
4. Small items can be shipped prepaid directly to EdgeTech by FedEx, DHL, UPS, Airborne, etc.
5. If the equipment is the property of EdgeTech (formerly EG&G Marine Instruments Division) please insure for full value.
6. Fax one invoice, packing list, and copy of airway bill to EdgeTech upon shipment.