



# DISTRIBUTION ZHC

## User Guide and Installation Manual

RF DISTRIBUTION HUB

FOR, BUT NOT LIMITED TO, P/N'S

ZBT0100052 24 PORT HUB

ZBT0100055 24 PORT HUB W/ FIBER RX

ZBT0100051 16 PORT HUB

ZBT0100054 16 PORT HUB W/ FIBER RX

ZBT0100050 8 PORT HUB

ZBT0100053 8 PORT HUB WITH FIBER RX

# Contents

---

Safety Precautions.....	3
Package Contents.....	4
Product Description.....	4
Specifications.....	5
Proper cable Layout design/Fiber Loss Budget.....	7
Required Equipment for Installation: .....	7
Hardware Installation and Master Unit Set-Up: Coax Backbone.....	8
Master Unit(s) Set-Up: Fiber .....	9
Slave Unit(s) Set-Up/Cascade Topology.....	11
Contact Us.....	13
.....	

# Safety Precautions

---

The presence of this symbol is to alert the installer and user to the presence of uninsulated dangerous voltages within the product's enclosure that may be of sufficient magnitude to produce a risk of electric shock.



**TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS DEVICE TO RAIN OR MOISTURE. DO NOT OPEN THE UNIT. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.**

- **DO NOT** apply power to the unit until all connections have been made, all components have been installed and all wiring has been properly terminated.
- **DO NOT** terminate, change or uninstall any wiring without first disconnecting the unit's power adapter from the device.
- This device is supplied with the appropriately rated power supply. The use of any other power supply could cause damage and invalidate the manufacturer's warranty.
- **DO NOT** connect the power cord to the device if the power cord is damaged.
- **DO NOT** cut the power cord.
- **DO NOT** plug the power cord into an AC outlet until all cables and connections to the device have been properly connected.
- The device should be installed in an environment consistent with its operating temperature specifications. Placement next to heating devices and ducts is to be avoided as doing so may cause damage. The device should not be placed in areas of high humidity.
- **DO NOT** cover any of the device's ventilation openings.
- **DO NOT** cover or obstruct the device's fan or fan openings.
- If the device has been in a cold environment allow it to warm to room temperature for at least 2 hours before connecting to an AC outlet.



# Package Contents/Inspection

This package contains:

- DISTRIBUTION ZHC RF DISTRIBUTION HUB
- One power cable
- ONE 125W DC POWER CUBE
- One installation / configuration manual

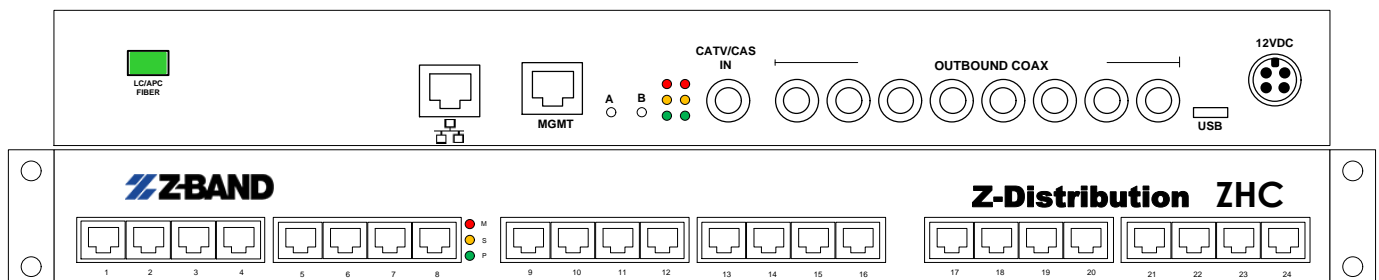
Inspect the package before starting installation to ensure there is no damage and that all supplied contents are present.

## Product Description

The Distribution ZHC Hub provides distribution of a modulated broadband RF spectrum, from 54-860 MHz, thru CAT cable (5e or better) per EIA/TIA 568 standards to up to 24 end devices (Active baluns, Z-Band P/N ZBT00100085: Recommended for full feature set, P/N ZBT0010021: Reduced feature set) which go to a TV Tuner. The hub accepts either a 75Ω RF input, or an optional Fiber input. The system also provides an RF “cascade” path through F connectors on the rear of the assembly, allowing a single hub to be cascaded to up to an additional 584 hubs.

The unit has automatic gain controls, that allow for plug and play set up, once the initial input to the first (Master) unit (or the Fiber TX) has been properly adjusted.

### REAR OF HUB ENCLOSURE



### FRONT OF HUB ENCLOSURE

# Specifications

<b>Physical Description</b>	
Dimensions:	17" wide x 1.7/16" x 12" deep (designed for 1RU of rack space)
Weight:	7lbs (total box weight including external power supply)
<b>Electrical Power</b>	
Power Consumption	12VDC/8.5A 102W MAX
External Power Supply Input Voltage	100-240V AC, 50-60Hz, 1.4A Max
BTU/HR	358 BTU/HR (MAX)
<b>Front Panel Output details</b>	
RF Outbound Signals	RF Output with 8V DC bias present on pins 7 & 8 on front panel CATEGORY cables.
IP Outbound	IP Output (10/100 max) on pins 1, 2, 3, 6 (with SWITCH option).
RS-232	Compatible in future
<b>RF System Requirements &amp; Frequencies</b>	
Frequency of operation	57-861 MHz (CH 2-CH 135) [designed for forward path only]
Carrier Noise (Analog)	C/N: Greater than 46dB
Modulation Error Ration (Digital)	MER: Greater than 36dB
Pilot Tone Frequencies	870Mhz default at 35dBmV (opt. 240 & 480 Mhz at 23dBmV)
<b>INPUTS &amp; OUTPUTS</b>	
INPUTS	OUTPUTS
RJ-45 (Ethernet & MGMT)	Qty. 8/16/24 RJ-45 ports designed for CAT6 or greater
Single Mode Fiber w/SC/APC	Qty. 8 75Ω F-Connector on rear for distribution to Cascaded units
75Ω F-Connector for CATV INPUT	micro-USB I/O

<b>Operating Environment</b>	
Operating Temperatures	0°C to 55°C
Relative Humidity	5% to 95% (non-condensing)
Storage Temperature	-40°C to 70°C
<b>LED Indication Lights</b>	
<b>Front Panel LEDs</b>	<b>Rear Panel LEDs</b>
RED LED: ON when unit is in MASTER mode	RED LED: SLAVE MODE with LOCKED CASCADE Distance
AMBER LED: ON when unit is in SLAVE mode	AMBER LED: MASTER MODE transmitting TONE
GREEN LED: Flashing GREEN - power supply error	GREEN LED: Blinking indicates distance LOCK timer is running
GREEN LED: Solid GREEN - power supply normal	
ALL LEDs ON: UNIT IS IN NATIVE MODE	
Conformance	
FCC Part 15 Subpart B Compliance	
UL/CSA Listed	
<b>Resolution</b>	
<p><b>Video Resolution :</b> Z-Band system performs no manipulation of the video programming. All visible and non-visible content is passed through to the viewing/decoding equipment. This includes but is not limited to closed captioning, EAS data, alternate languages, and any resolutions within the video channel.</p>	

### Unpacking and Inspection

Each unit is shipped factory tested. Ensure all items are removed from the packing container prior to discarding any packing material.

Thoroughly inspect the unit for shipping damage with particular attention to connectors. If there is any sign of damage to the unit or damaged or loose connectors contact your distributor immediately. Do not put the equipment into service if there is any indication of defect or damage.

## Proper Cable Layout Design/Fiber Loss Budget

---

Before installing make sure that you have the proper cable layout for the project including:

1. The CAT cable per 568 standards for video drops
2. The layout is especially important for the coax cascade as it can be done with different designs, some which might not be optimum. **IT IS RECOMMENDED THAT YOU USE THE FREE Z-BAND DESIGN SERVICE. Z-BAND WILL PROVIDE A DRAWING WITH THE RECOMMENDED BACKBONE CABLE DESIGN**
3. [Make sure that you fiber loss budget allows for the proper level at each fiber drop.](#) **Z-Band will assist the customer with calculating and proper equipment for the design.**

## Required Equipment for Installation

---

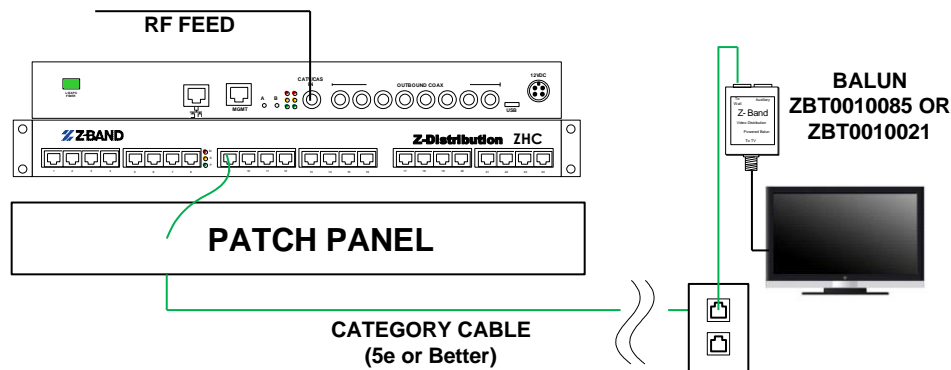
Installing a Distribution ZHC requires the following:

1. Standard Rack Mounting tools
2. Field RF Meter capable of measuring levels and signal quality. **(Z-Band can assist with evaluating or procuring the proper equipment).** A proper installation cannot be done without out the appropriate meter! Z-Band can be of minimal help in diagnosing issues without a meter on site.
3. If a fiber backbone is used, a Fiber Level Meter is again strongly recommended.

# Hardware Installation and Master Unit Set-Up: Coax Backbone

It is highly recommended that quality cables and connectors be used for all video and audio source connections, that the rack be grounded and that the Hubs be powered through a UPS system.

1. The Hub is designed to be rack mounted in a standard EIA 19" rack. Rack all units in the install but DO NOT POWER units up at this time. Use a quality 75Ω RG6 or RG11 coaxial cable with "F" connectors to cable the coax cascade backbone to all units (Reference Following **Cascade** section). Recommended that you use Z-Band design drawing.
2. Connect the CAT patch cords from the front panel RJ45's to the proper port in the Patch Panel. **(Always use matched patch cords to the infrastructure cable, i.e. if CAT 6 infrastructure, use CAT 6 patch cord, if CAT 5e infrastructure, use CAT 5e patch cords, etc.)**
3. Attach ZHC Baluns (ZBT0010085 or ZBT0010021) with patch cords at each video drop, using the TO WALL RJ on the balun. Using good quality RG6 Cable with F connectors, attach to Balun and to TV Tuner.

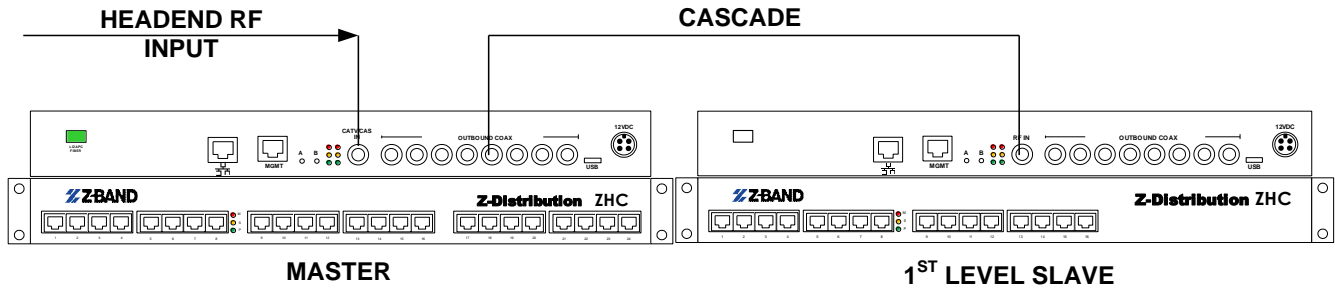


4. At RF headend adjust signal so that the input to the MASTER ZHC is 20+/-2 dBmV for all channels across the spectrum for digital or is 23 dBmV+/-2 for analog. It is extremely important that the whole spectrum is FLAT (0 slope) for the system to perform properly. Also ensure that the signal quality is good. That means for all digital signals a MER of >36dB and for analog signals a CN of >46 dB. If your quality is below that going into the system, the resulting feed may encounter problems. If your feed is bad, please contact your Cable Service Provider to correct.

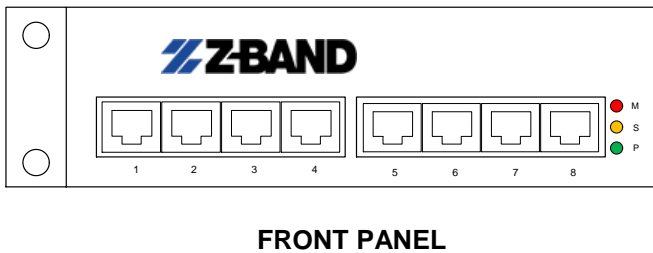
**NOTE:** These measurements should be taken at the end of the cable that is to attach to the Master ZHC.



5. Attach adjusted and verified Headend Feed to the RF IN port on the master unit.



6. Power up Master unit only. Note the 3 LED's of the left side of the front panel. Upon powering unit, all 3 LED's will be lit. After ~30 seconds, the middle Yellow LED will go out. This indicates that the unit had adjusted to Master



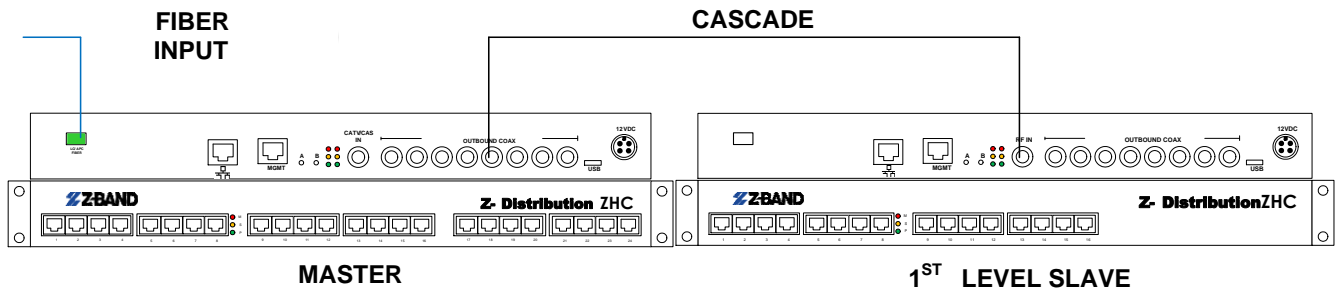
- When powered all 3 LED's lit
- After ~30 sec YELLOW goes out
- Only RED and GREEN (Power) are lit- Unit is in MASTER

**NOTE:** If less than 10 channels are used in the RF stream, the unit may not switch to Master. Contact Z-band for assistance in “forcing” unit to Master

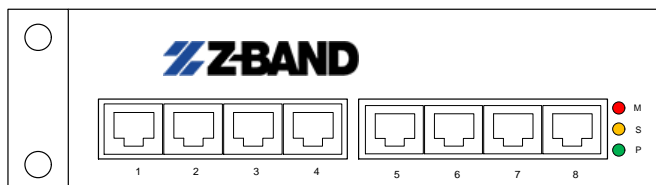
## Master Unit(s) Set-Up: Fiber

**NOTE:** Units purchased as fiber units have a built-in fiber receiver. They have been configured at the factory to only receive a fiber input and are all set to Master. If the need arises to use the unit for another purposes, such as a coax master or a slave unit, please contact Z-Band for assistance in reconfiguring the unit. **All connections in the fiber links must be either fusion spliced or Angle Polished (APC). All connections on Z-Band furnished equipment has SC/APC. If a different series of connector are used on the fiber patch trays, a cross series patch cord can be used so long as it is an APC connection.**

1. The Hub is designed to be rack mounted in a standard EIA 19” rack. Rack all Fiber units in the install but DO NOT POWER units up at this time. Use a quality 75Ω RG6 or RG11 coaxial cable with “F” connectors to cable the coax cascade backbone to all units (Reference Following **Cascade** section). Recommended that you use Z-Band design drawing.
2. Rack the Fiber TX at the headend, as well as the Fiber coupler (if needed). **It is recommended that a Z-Band Light Fiber TX be used, as this unit will automatically correct for channel loading. If not using a Z-Band Light unit, please refer to the Fiber TX manufacturer’s guide for proper channel load/level set-up.**
3. At RF headend adjust signal so that the input to the Z-Band Light Fiber TX is 20+/-2 dBmV for all channels across the spectrum for digital, or is 23 dBmV+/-2 for analog. It is extremely important that the whole spectrum is FLAT (0 slope) for the system to perform properly. Also ensure that the signal quality is good. That means for all digital signals a MER of >36dB and for analog a CN of >46 dB. If your quality is below that going into the system, the resulting feed may encounter problems. If your feed is bad, please contact your Cable Service Provider to correct. **These measurements should be taken at the end of the cable that is to attach to the Master ZHC.**
4. Connect the fiber patch from the Fiber TX to the Fiber Coupler (if used), and then from the Fiber Coupler to the fiber patch tray.
5. In the closet where the ZHC Fiber Hub resides, attach the fiber patch cord to the fiber patch tray. Measure the output from the fiber patch to verify that it is within the required limit of -1 to -5 dBm.
6. Attach the fiber patch to the SC/APC fiber connector on the rear of the ZHC Hub.



7. Power up Master unit only. Note the 3 LED’s of the left side of the front panel. Upon powering unit, all 3 LED’s will be lit. After ~30 seconds, the middle Yellow LED will go out. This indicates that the unit had adjusted to Master



FRONT PANEL

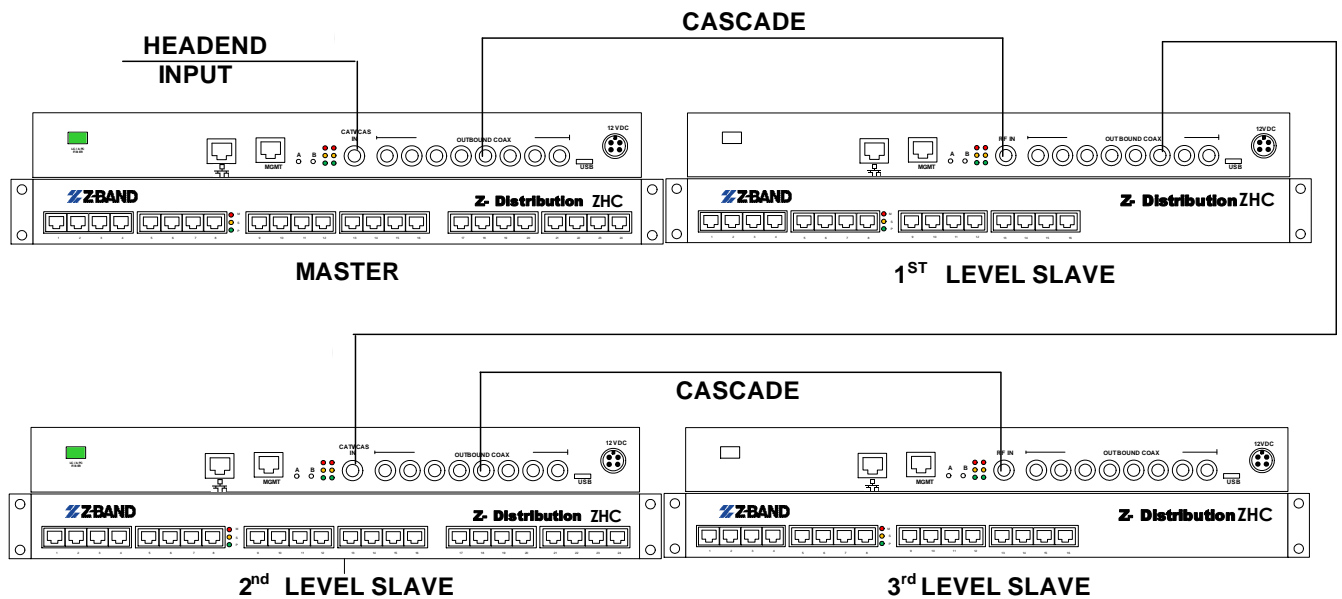
- When Powered on all 3 LED’s lit
- After ~30 sec’s Yellow goes out
- Only Red and Green are lit. Unit now Auto Adjusted in Fiber Master

# Slave Unit(s) Set-up

All slave units are cabled the same way using coax RG6 or RG11 for back bone. The following section describes the CASCADE features of the Distribution ZHC.

## CASCADE TOPOLOGY

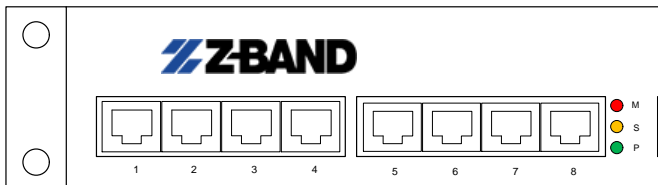
1. The Master unit produces a 35 dBmV, 1kHz tone at 870 MHz and injects it into the RF stream coming from the Outbound Coax. The connected downstream unit detects the tone from the Master, which sets the unit to Slave. The slave unit then measures the tone and automatically adjusts its internal attenuators and slopers to produce the proper RF output levels for the unit.
2. Cascades can go 4 levels deep, Master to 3 Levels of Slave cascade
3. All cascades go from an OUTBOUND COAX port (MASTER or Lower Level Slave) to the CATV/CAS IN Port (Higher Level Slave)



4. The distance between units can be up to 400' when using RG6 cable and 600' when using RG11 cable.
5. **Always try and design to keep the lowest level Cascade. Example: Closet has the MASTER and 3 SLAVE units. The proper way to Cascade is to take 3 feeds from the Outbound Coax on the MASTER and Run one to each of the Slaves. The wrong way is to go from the Master to Level 1 Slave, from Level 1 Slave to Level 2 Slave, from Level 2 Slave to Level 3 Slave.**

## SLAVE SET-UP

1. Perform the same procedure for each closet
2. Make sure that the Master is set-up and functioning correctly.
3. Make sure that Coax from Master or lower level cascade(s) are connected
4. Always start with the lowest level cascade in the closet. Power just that unit. When first powered all 3 LED's on front Panel come on. Within 30 sec's the top RED LED will go off and only the Yellow and Green LED will be lit. This indicates the unit is in Slave.

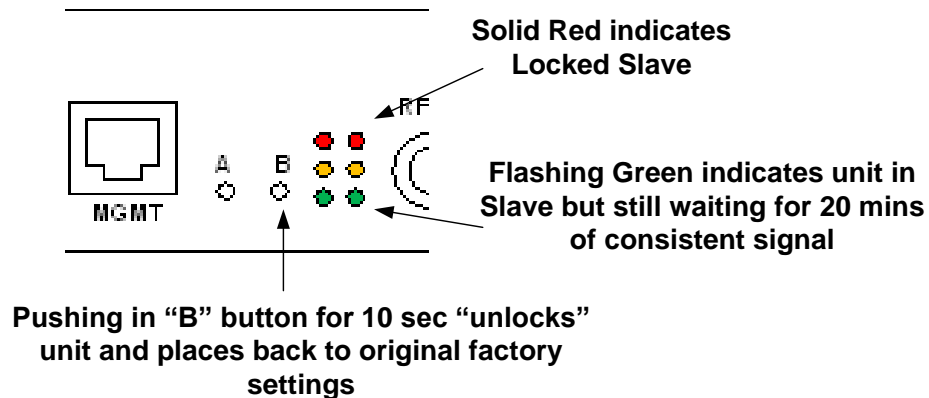


- When powered all 3 LED's on
- After ~30 secs RED LED off
- Unit is now on Slave

**FRONT PANEL**

5. The unit will remain unlocked until the unit has measured a steady tone for ~20 mins. This is indicated by a flashing Green LED on the rear of the enclosure.

## REAR OF ENCLOSURE



6. When the unit has detected a steady tone for 20 minutes the unit will lock, as indicated by a solid RED LED on the rear of the enclosure. A locked unit will stay in Slave, retaining the output setting that it has established, even thru Power cycling. If the set-up needs to be

changed, the pin button, labeled “B” on the rear of the enclosure must be pushed in for ~10 sec’s. This will unlock the unit and place it back to its original factory settings.

7 . Repeat this procedure for the next higher slave level, if necessary.

**8 . If the next highest Slave level in in a different closet, make sure to bring up the closet with the lower Slave level fist**

## Contact Us:

---

If issues arise while performing the install, please contact Z-Band. We will be glad to assist. The number is: 717.249.2606 and press 2 for Engineering.

Our business hours are:

8:30-5:00 Eastern Time, Monday-Friday.