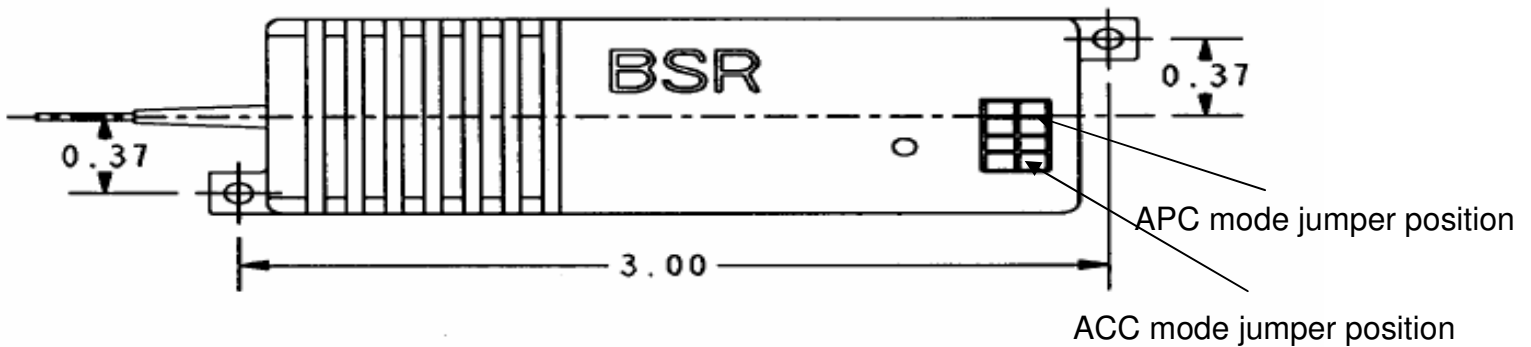


FiberTec™ Operation Sheet-without pins and 5th wire

This FiberTEC (FTEC) module has no circuitboard pins on the bottom of the package. The interface is through three points: The 4 wires for power, the fifth wire for power adjustment, and the two pin jumper. The jumper location is shown below.



Wire Configuration:

- | | |
|----------------|----------------|
| 1. Brown: | TEC GND |
| 2. Red: | TEC + |
| 3. Yellow: | Laser GND |
| 4. Orange: | Laser Driver + |
| 5. Green/Blue: | Power Adjust |

NOTE: To prevent ESD damage to the module, a properly grounded wrist strap should be worn whenever moving or handling the laser.

NOTE: Optical fiber pigtails are easily damaged. Never handle the device by the pigtail, but always grab the module by the metal housing.

NOTE: If your unit comes with a collimator, avoid having to remove the connector. This allows dirt to enter the collimator and also may affect the optical beam quality.

NOTE: If you do not have a collimator, clean the tip of the fiber optic pigtail with isopropyl alcohol and a lint free swab for best results.

NOTE: When inserting or removing the fiber tip from the collimator, or when making and breaking a fiber-to-fiber connection, the optical power should be OFF to prevent damage to the laser diode.

NOTE: The 405nm FTEC module must be mounted on a heatsink. The bottom of the package in the front of the module, underneath the fins, should make solid contact with a metal heatsink. A small amount of thermal grease is recommended. For best lifetime performance, it is recommended that other FTEC modules be mounted on a heatsink.

Using the FTEC with the FiboTEC Power Supply:

For all FTEC modules, the TEC and the laser driver have to be run off of separate power supplies. The laser driver (yellow and orange wires) is run off of 5V +/-5%, while the TEC (brown and red wires) is run off of 3.3V +/-10%. (Due to the nature of the 405nm diode, the FTEC405 module must have 6.5V +/-5% for the laser driver.) The FiboTEC Power Supply provides ample current for the FTEC for both of these supplies through its DB9 connector. The connector pin out is supplied with the power supply. If your FTEC comes with a DB9 connector already attached to the wires, you may simply plug it directly into the power supply.

The power output of the laser is then adjusted through the BNC connector on the supply. The FTEC comes from the factory preset into the ACC mode. The BNC center terminal connects directly to the blue/green fifth wire, and the outer terminal of the BNC is internally connected to the LD GND. An analog voltage between 0 and ~5V will drive the unit from 0 to full power.

NOTE: *The source supplying this voltage must have its GND connected to the outer terminal of the BNC connector*

NOTE: *Do NOT exceed the Vset voltage on the BNC input that is given for the individual laser in its test report by more than 5%. This may damage the laser diode.*

After turning on the power supplies, the FTEC will stabilize the TEC and power output in less than 10 minutes. In the ACC mode, the FTEC will maintain a constant current to the laser. The current value can be increased by increasing the voltage on the BNC input. Do not exceed the maximum voltage. A plot of voltage vs. power is include with the final test report for the unit.

To switch between ACC and APC modes, turn off the supply voltage and switch the jumper. Turn on the power supply and increase the BNC voltage until the desired level is reached.

NOTE: *When going between either mode, it is best to set the BNC voltage to 0V. This will prevent any current damage upon power up in the subsequent mode.*

NOTE: *When switching the jumper just push the jumper onto the pins just far enough to make good contact. Pushing the jumper all the way down will make it difficult to switch it at a later time.*

In the APC mode the FTEC works to maintain a constant P_{out} . To change this power level, again vary the voltage as needed on the BNC input.

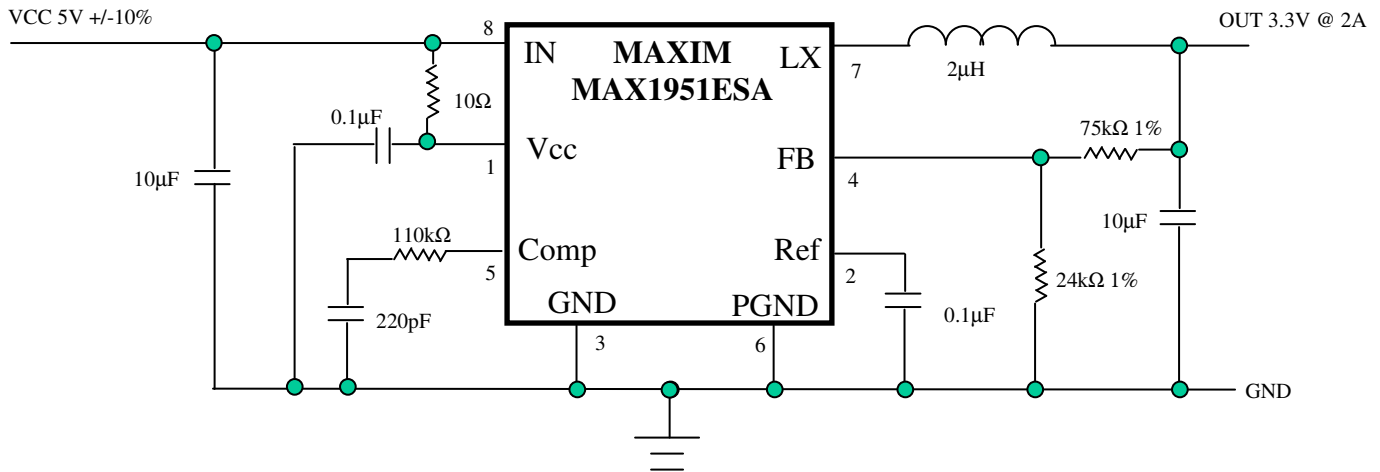
NOTE: *Care must be used in this mode as it is possible to overdrive the bias current to the laser if the BNC voltage is too high.*

NOTE: *It is not recommended to operate the FTEC405 in APC mode for best stability as the internal photodiode is not reliable over long term operation.*

Using the FTEC with other Power Supplies:

The laser driver (yellow and orange wires) is run off of 5V +/-5%, while the TEC (brown and red wires) is run off of 3.3V +/-10%. (Due to the nature of the 405nm diode, the FTEC405 module must have 6.5V +/-5% for the laser driver.) The 5V supply draws a maximum of 250mA, and the 3.3V supply should be able to source up to 2A, although this is only used in extreme conditions.

If a 3.3V supply is not readily available, 3.3V may be derived from the 5V supply with a DC-DC converter chip. It should be able to source 2A of current. The following chip layout from Maxim, the MAX1951ESA, is recommended to create a 3.3V source from your 5V supply.



The FTEC comes from the factory preset into the ACC mode and set for the rated power output. The fifth wire, the blue/green wire, is used to adjust the power output of the laser. An analog voltage between 0 and 5V will drive the unit from 0 to full power. Note that due to threshold levels of the laser diode, no power will exit the laser until 2-3V is applied to this wire.

NOTE: Do NOT exceed the V_{set} voltage on the BNC input that is given for the individual laser in its test report. This may damage the laser diode.

NOTE: The source supplying this voltage must have its GND connected to the 5/6.5V laser driver GND.

NOTE: If running in APC mode, its best not have this wire floating upon power up. The power will go an indeterminate state and may draw excessive current.

After turning on the power supplies, the FTEC will stabilize the TEC and power output in less than 10 minutes. In the ACC mode, the FTEC will maintain a constant current to the laser. The current value can be increased by increasing the voltage on the blue/green wire. Do not exceed ~5V. A plot of voltage vs. power is include with the final test report for the unit.

To switch between ACC and APC modes, turn off the supply voltage and switch the jumper. Turn on the power supply and increase the blue/green wire voltage until the desired level is reached.

NOTE: When going between either mode, it is best to set the blue/green wire voltage to 0V. This will prevent any current damage upon power up in the subsequent mode.

NOTE: When switching the jumper just push the jumper onto the pins just far enough to make good contact. Pushing the jumper all the way down will make it difficult to switch it at a later time.

In the APC mode the FTEC works to maintain a constant P_{out} . To change this power level, again vary the voltage as needed on the blue/green wire.

NOTE: Care must be used in this mode as it is possible to overdrive the bias current to the laser if the trimpot is turned too far.

NOTE: It is not recommended to operate the FTEC405 in APC mode for best stability as the internal photodiode is not reliable over long term operation.

Further information may be found in our application section of our website, <http://www.blueskyresearch.com/technicalnotes.htm>

Thank you and enjoy your FTEC module!