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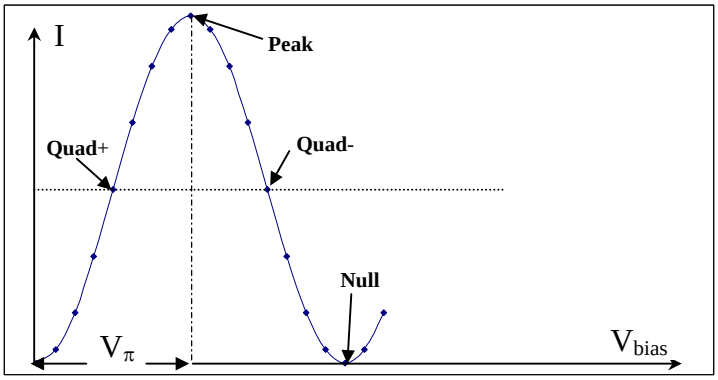
Operation Instructions for Mini-MBC-1

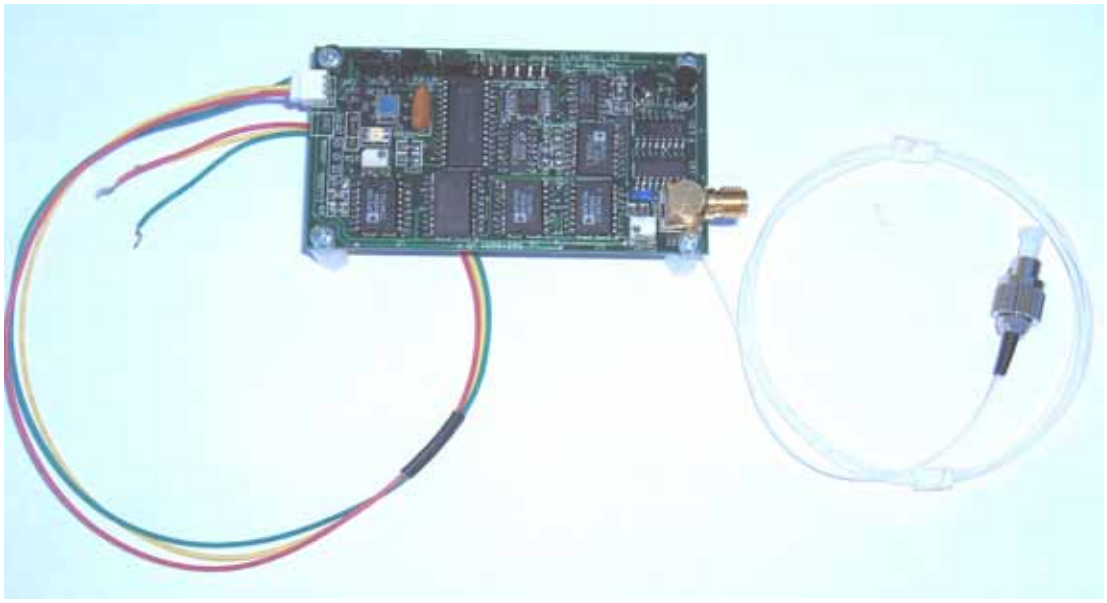
(Last updated on 1/27/06, Rev.1.0)

Mini-MBC-1 is a full-function miniature OEM version of the Modulator Bias Controller (MBC) family. It is designed especially suitable for systems used for analog applications. Mini-MBC-1 is designed to lock the working point of the modulator at positive slope quadrature (quad+), negative slope quadrature (quad-), null or peak points of its characteristic curve respectively. The locking mode and slope can be selected from the board by changing positions of jumpers. Please check our website for data sheet and spec (**http://WWW.YYLABS.COM**).



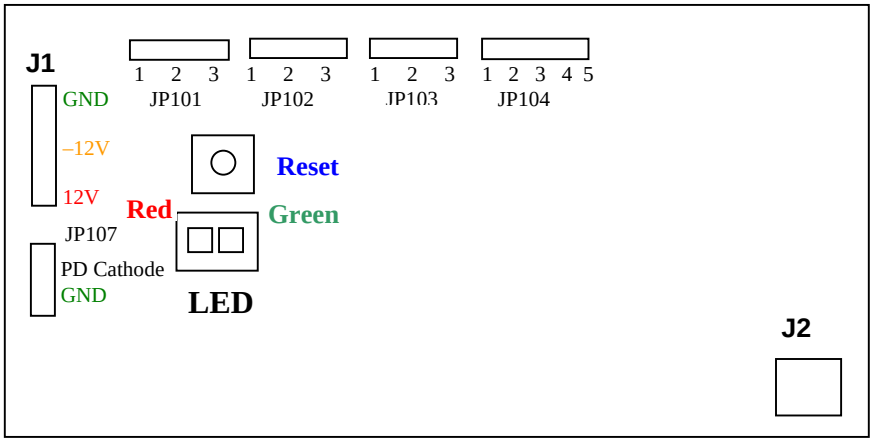
Features of Mini-MBC-1

- User selectable locking slope (QUAD+ ↔ QUAD-, NULL ↔ PEAK);
- User selectable locking mode (Quad+/Quad- ↔ Null/Peak);
- Two operation modes: calibration mode and locking mode;
- Calibration off mode for quick system setup in locking mode;
- Low profile (3.1” * 1.6” * 0.65”);
- Access for external photo-detector.



Mini-MBC-1

1. Mini-MBC-1 Layout



1.1 Overview

Connectors:
J1 ----- 3-pin terminal for power supply input.
J2 ----- SMA for bias voltage output.
JP107---External Photo-detector (optional)
Jumpers:
JP101 --- calibration mode selection.
JP102 --- locking mode selection.
JP103 --- locking slope selection.
JP104---- reserved for factory use.
Others:
Reset Button --- for board reset.

LED: to indicate working status

1.2 Function description of each operating components

Connector J1 --- power supply input.

Pins	Description
1	Common
2	-12VDC (+/- 0.5V) @ 40mA
3	+12VDC (+/-0.5V) @ 60mA

Jumper JP101 --- Calibration Mode selection.

Pins status	Description
1,2 short	Calibration mode. A calibration process will be always started when power turns on or reset button is pressed. Vπ, current bias and light intensity will be recorded into the on-chip EEPROM in the microprocessor. After calibration operation, the unit will go into locking mode
2,3 short	No Calibration mode. The calibration process will not be initiated. Instead, the unit will use the stored Vπ, bias and light intensity in the EEPROM to configure the circuitry and directly close the servo loop.

Jumper JP102 --- Locking mode selection.

Pins status	Description
1,2 short 2,3 open	For Quadrature point locking.
1,2 open 2,3 short	For Null/Peak point locking.

Jumper JP103 --- Locking slope selection.

Pins status	Description
1,2 short	Positive slope: for QUAD+ or Null
3,4 short	Negative slope: for QUAD- or Peak

Others:

Reset Button --- for board reset.

Pushing and releasing this button will reset the unit. After light intensity and modulator changed, or jumper position of JP102, JP103 changed, it is recommended to reset the unit.

2. Calibration Mode

To enter this mode, short pin1 and pin2 of JP101.

In this mode, a calibration process will start when power is turned on or the reset button is pushed and released. The modulator and light intensity received by the photo detector is calibrated, and three parameters will be acquired and stored into the on-chip EEPROM in the microprocessor, including V_{π}, V_{bias} (Bias voltage according to current locking point) and I_{light} (light intensity). After the calibration process finished, the unit goes into locking mode automatically. When the pin-1 and Pin-2 are shorted, the calibration process will be skipped, the stored V_{π} and I_{light} will be used to configure the circuit, and V_{bias} will be used as an initial bias voltage for the servo loop.

When the calibration mode should be used? Normally, when **the modulator** or **the light intensity** of the laser source is **changed**, it is recommended to start a new calibration process. You may also connect an optical power meter to the output of the modulator, use this calibration function to calibrate each working point of peak, quad and null of the modulator.

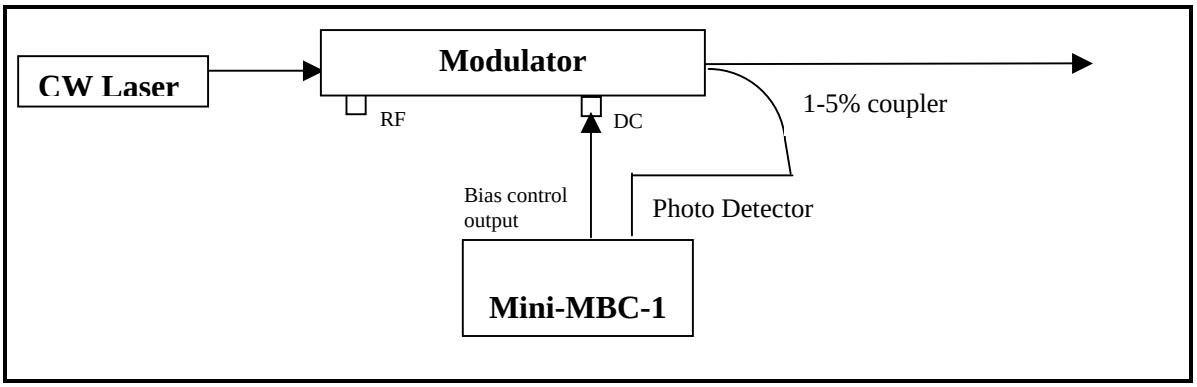
Normally, calibration mode will be only used at system setup stage. Once the system has been set up, the modulators and light sources will remain unchanged, so they need not calibration every time when power turns on. For this reason, it is recommended to short pin-2 and pin-3 of JP101 to skip the calibration process to reduce the system initialization time.

4. Indicator

Status	Description
Red	No light / Light is too weak / Bias is not connected /light is too strong
Flashing green	In calibration process / It's locking
Green	It's locked

5. Major Application

Typical Analog Applications



Configuration for Mini-MBC-1

6. Note

The photo-detector integrated in the modulator can be in the same phase or the opposite phase with the input or output signal, depending on the process of different manufacturers. Therefore, the mini-MBC-1 may receive a feedback signal, which may or may not be the same phase with the pilot-tone. Therefore, Jump position of JP103 does not give absolute sign of the slope. When pin-1 and pin-2 of JP103 is shorted, it could be either slope, but changing the jump's position certainly will switch the slope from one to the other.

For any question or information, please contact:

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