IQABC

AUTOMATIC BIAS CONTROLLER

SPECIFICATION SHEET

AVAILABLE IN PXI
AVAILABLE IN MATRIQ

quantifiphotonics.com
The IQABC uses advanced algorithms to Automatically Bias Control (ABC) the DC voltage bias points required to control an OIF-compliant optical modulator.

The easy-to-use COHESIONUI™ graphical interface enables the user to quickly optimize these DC modulator voltages (either automatically or manually) for ideal QPSK, DP-QPSK, and other M-QAM optically modulated signals.

**Format-independent ABC algorithm.**
The robust ABC algorithm works with any modulation formats for a truly automated operation.

**Compatible with OIF standard IQ modulators.**
The external modulator adaptor board provides simple and quick connectivity to any IQ modulator with OIF compatibility.

**Accurate & stable tracking of bias drifts.**
The advanced ABC algorithm constantly tracks any drift, so you get stable and repeatable results every time.

**Independent control of all DC biases.**
Each I, Q or phase DC biases can be controlled independently in either automatic or manual mode.

**Superior connectivity.**
You can control IQABC locally or remotely via USB or Ethernet. With its SCPI compatibility, the option is yours.

**Easy-to-use software.**
COHESIONUI web-based user interface provides access to all the functions in a clean, simple and intuitive graphical layout.
Hit the AUTO button and focus on your research without worrying if your modulator is biased correctly.

Quantifi Photonics’ IQABC’s advanced ABC (Automatic Bias Control) algorithm accurately and reliably controls and optimizes all the modulator bias points regardless of the modulation format or pattern.

Optimizing DC bias points of an IQ modulator is no trivial task. There are six different Mach-Zehnder structures inside one dual polarization IQ modulator, all simultaneously influencing the properties of a single optical signal. Trying to optimize bias points using just the intensity measurement of the optical signal is time consuming, inaccurate and requires a lot of knowledge and experience.

With its robust and adaptive ABC algorithm, IQABC will take care of finding optimal bias points and maintaining optimization against any bias drifts or changes to the driving signal. So put IQABC to work and enjoy having a stable and reliable optical signal for all your testing and development needs.

Simply connect your OIF compliant IQ modulator to an IQABC modulator adaptor board and feed the modulator’s optical output to IQABC, then you are ready to go. The IQABC starts to optimize the biases automatically upon start-up.
Simple, intuitive control with COHESION UI™

COHESION UI makes it simple to control our PXI or MATRIQ instruments from a PC, tablet or smartphone. Its cutting-edge design offers a sleek modern interface, cross device compatibility, customizable views and remote network access.
The MATRIQ series provides the same high-performance test capabilities of our PXIe modules in a compact benchtop design. MATRIQ instruments are simple to setup and easy to operate, making them the perfect choice for your optical lab or test bench.

- Same performance and control as our PXIe modules
- Plug and play with USB or Ethernet connectivity
- Control via the web-based GUI, COHESIONUI or SCPI commands
- Compact and portable design saves benchtop space
IQABC TECHNICAL SPECIFICATIONS

PXI – MODULAR

**IQABC-1001-1-FC-PXIE**

MATRIQ – COMPACT & PORTABLE

**IQABC-1001-1-FC-MTRQ**
### IQABC TECHNICAL SPECIFICATIONS

#### General Specifications

<table>
<thead>
<tr>
<th></th>
<th>PXI</th>
<th>MATRIQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus connection</td>
<td>PXIe</td>
<td>USB or ethernet</td>
</tr>
<tr>
<td>Slot count</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Optical connector type</td>
<td>FC/PC, FC/APC, SC/PC, SC/APC</td>
<td>FC/PC, FC/APC, SC/PC, SC/APC</td>
</tr>
<tr>
<td>Number of channels</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Dimensions (HxWxD)</td>
<td>130 x 20 x 215 mm</td>
<td>5.1 x 1.6 x 8.5 inch</td>
</tr>
<tr>
<td>Dimensions (HxWxD)</td>
<td>53 x 120 x 202 mm</td>
<td>2.1 x 4.7 x 8.0 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>~ 1 kg (~ 2.2 lbs)</td>
<td>~ 11 kg (~ 2.4 lbs)</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>5 °C to 45 °C</td>
<td>5 °C to 45 °C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-40 °C to 70 °C</td>
<td>-40 °C to 70 °C</td>
</tr>
</tbody>
</table>

#### Power Specifications

<table>
<thead>
<tr>
<th></th>
<th>PXI</th>
<th>MATRIQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC input voltage range</td>
<td>Please refer to the latest PXI Express Hardware Specifications published by the PXI Systems Alliance.</td>
<td>90 to 264 VAC</td>
</tr>
<tr>
<td>AC input current</td>
<td></td>
<td>1.3A (115Vac), 0.9A (230Vac)</td>
</tr>
<tr>
<td>AC frequency range</td>
<td></td>
<td>47 to 63 Hz</td>
</tr>
<tr>
<td>DC output voltage</td>
<td></td>
<td>12V</td>
</tr>
<tr>
<td>DC output current max</td>
<td></td>
<td>5.41A</td>
</tr>
<tr>
<td>Dimensions (LxWxH)</td>
<td></td>
<td>4.58 x 2.06 x 1.23” (116.3 x 52.4 x 31.3 mm)</td>
</tr>
</tbody>
</table>

Specifications continued over page
## MODELNAME TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>1001</th>
<th>1002</th>
<th>1001</th>
<th>1002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber type</td>
<td>Single mode fiber</td>
<td>Polarization mode fiber</td>
<td>Single mode fiber</td>
<td>Polarization mode fiber</td>
</tr>
<tr>
<td>Supported modulator types</td>
<td>Single &amp; dual pol. LiNbO3 IQ Mach Zehnder</td>
<td>Single &amp; dual pol. LiNbO3 IQ Mach Zehnder</td>
<td>Single &amp; dual pol. LiNbO3 IQ Mach Zehnder</td>
<td>Single &amp; dual pol. LiNbO3 IQ Mach Zehnder</td>
</tr>
<tr>
<td>Supported modulation formats</td>
<td>Any modulation format</td>
<td>Any modulation format</td>
<td>Any modulation format</td>
<td>Any modulation format</td>
</tr>
<tr>
<td>Bias control options</td>
<td>Automatic locking and individual manual bias</td>
<td>Automatic locking and individual manual bias</td>
<td>Automatic locking and individual manual bias</td>
<td>Automatic locking and individual manual bias</td>
</tr>
<tr>
<td>Maximum bias voltage range</td>
<td>28 V</td>
<td>28 V</td>
<td>28 V</td>
<td>28 V</td>
</tr>
<tr>
<td>Number of bias control channels</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Start up time until settled</td>
<td>&lt; 3 minutes (&lt; 1 minute typical)</td>
<td>&lt; 3 minutes (&lt; 1 minute typical)</td>
<td>&lt; 3 minutes (&lt; 1 minute typical)</td>
<td>&lt; 3 minutes (&lt; 1 minute typical)</td>
</tr>
<tr>
<td>Quadrature error</td>
<td>Averaged mean: &lt; ± 0.3°, standard deviation: &gt; 24 hours: &lt; 2°</td>
<td>Averaged mean: &lt; ± 0.3°, standard deviation: &gt; 24 hours: &lt; 2°</td>
<td>Averaged mean: &lt; ± 0.3°, standard deviation: &gt; 24 hours: &lt; 2°</td>
<td>Averaged mean: &lt; ± 0.3°, standard deviation: &gt; 24 hours: &lt; 2°</td>
</tr>
<tr>
<td>ABC impact on EVM</td>
<td>&lt; 1%</td>
<td>&lt; 1%</td>
<td>&lt; 1%</td>
<td>&lt; 1%</td>
</tr>
<tr>
<td>Wavelength range</td>
<td>1260 nm - 1620 nm</td>
<td>1510 nm - 1610 nm</td>
<td>1260 nm - 1620 nm</td>
<td>1510 nm - 1610 nm</td>
</tr>
<tr>
<td>Dither size vs Vpi</td>
<td>max 5%, typical 2%</td>
<td>max 5%, typical 2%</td>
<td>max 5%, typical 2%</td>
<td>max 5%, typical 2%</td>
</tr>
<tr>
<td>Max optical input power to ABC</td>
<td>+10 dBm</td>
<td>+10 dBm</td>
<td>+10 dBm</td>
<td>+10 dBm</td>
</tr>
<tr>
<td>Optical insertion loss</td>
<td>&lt; 0.6 dB</td>
<td>&lt; 0.6 dB</td>
<td>&lt; 0.6 dB</td>
<td>&lt; 0.6 dB</td>
</tr>
<tr>
<td>Optical power operating range</td>
<td>-5 dBm to +10 dBm</td>
<td>-5 dBm to +10 dBm</td>
<td>-5 dBm to +10 dBm</td>
<td>-5 dBm to +10 dBm</td>
</tr>
<tr>
<td>RF drive levels supported</td>
<td>0 to 1.9 Vpi</td>
<td>0 to 1.9 Vpi</td>
<td>0 to 1.9 Vpi</td>
<td>0 to 1.9 Vpi</td>
</tr>
<tr>
<td>Manual bias control range</td>
<td>± 13 V</td>
<td>± 13 V</td>
<td>± 13 V</td>
<td>± 13 V</td>
</tr>
</tbody>
</table>

**Notes**

1. A small low frequency dither is applied to the biases as part of the control mechanism.
2. Specifications are valid at 23 °C ± 3 °C.
3. Average power with modulation applied.
ORDERING INFORMATION

Model number:
1001 = Single Mode Fiber
1002 = Polarization Maintaining Fiber

Connector Type
FC = FC/PC
FA = FC/APC
SC = SC/PC
SA = SC/APC

Number of channels
1 = 1 channel

ACCESSORIES

Options
9001 = Solder type adapter board for use with OIF compatible dual polarization IQ modulator.
9002 = Plug-in type adaptor board for use with OIF compatible dual polarization IQ modulator.
9003 = Solder type adapter board for use with OIF compatible single polarization IQ modulator.
9004 = Plug-in type adaptor board for use with OIF compatible single polarization IQ modulator.
9005 = Cable for connecting the adaptor board to the IQABC main unit.
9006 = Break-out cable for use with any IQ modulator.

WARRANTY INFORMATION

This product comes with a standard 1 year warranty.
EXTENDED WARRANTIES AND CALIBRATION PLANS

With an extended warranty and calibration plan you’ll spend more time focused on your priorities and less time worrying about maintenance.

Your choice: add a 3 or 5 year extended warranty when you buy.

Guarantee performance
Ensure your equipment is operating at the best it can be for reliable and accurate results.

Lower cost of ownership
Lock in savings and maximise your testing budget with a lower base cost of ownership.

Peace of mind
Spend less time worrying about maintenance and more on generating results.

CALIBRATION PLANS FOR ADDITIONAL DISCOUNTS

Order a calibration plan when purchasing your Quantifi Photonics instruments and get additional discounts.

10% Discount
On calibrations ordered at the time of purchase.

25% Discount
Add on an extended warranty and receive a 25% discount on calibrations.

Over time and with regular use, all optical parts and connectors require re-calibration and maintenance to guarantee accurate and reliable performance. We recommend Quantifi Photonics optical instruments are re-calibrated every 12 months. With an instrument calibration performed by Quantifi Photonics technicians you receive:

- Comprehensive calibration to factory specifications
- End-to-end inspection to ensure all instrument functions are working and connectors are clean
- Firmware, software and documentation updates
- Certificate of calibration which includes detailed test results

How to do I secure my extended warranty or calibration plan?

Contact your Quantifi Photonics sales representative or email sales@quantifiphotonics.com

Extended warranties and calibration plans must be ordered at the time of purchase and are available only for Quantifi Photonics’ products. The 25% calibration discount only applies to calibrations while the product is covered by the extended warranty period.
Our portfolio of optical & electro-optical test modules is rapidly expanding to meet a wide range of customer requirements and applications.

**Tunable Laser Sources**
Versatile telecom laser sources with full tunability across C or L bands. Narrow 100 kHz linewidth, up to 16.5 dBm of power, optional whisper mode to disable frequency dither.

**Fixed Wavelength Laser Sources**
Highly customizable DFB or FP laser sources available in a wide range of wavelengths and powers. Models support SMF, MMF and PMF.

**Swept, Tunable Continuous Wave Laser**
Swept, tunable continuous wave (CW) laser source with 0.01 dB power stability and 400 nm/s high-speed scan rate for R&D and production testing.

**Superluminescent Diode Broadband Light Source**
Super-luminescent LED light source with high output power, large bandwidth and low spectral ripple and various wavelengths.

**Erbium-Doped Fiber Amplifier (EDFA)**
High power Erbium-Doped Fiber Amplifier for signal power amplification in C and L bands with various control modes, including automatic gain control.

**Variable Optical Attenuator (VOA)**
Fast attenuation speed with low insertion loss and built-in power monitoring. Operates in fixed attenuation or constant output power modes. Models support SMF, MMF and PMF connector types.

**Polarization Controller & Scrambler**
High-speed automated polarization control with broad wavelength coverage from 1260nm to 1650nm, low insertion loss and back reflection. Full remote control via intuitive GUI, LabVIEW or SCPI.

**Optical-to-Electrical Converter**
High bandwidth, broadband O-to-E converter. Available in a range of configurations, choose from 1 or 2 channels, AC or DC coupling and various conversion gain and operating wavelength ranges.

**Optical Switch**
Proven reliability and fast switching time. Wide variety of switch configurations: 1x4, 1x8, 16x16 and more. Models support SMF, MMF and PMF.

**Optical Power Meters**
Fast terminating or inline monitoring of optical signal power from -60 to +10 dBm across 750 – 1700 nm wavelengths. Model with logarithmic analog output for applications such as silicon photonics fiber alignment.

**Bit Error Rate Tester (BERT)**
2, 4 or 8-channel Pulse Pattern Generator and Error Detector at rates up to 29 Gbps for the design, characterization and production of optical transceivers and opto-electrical components.

**Photonic Doppler Velocimeter (PDV)**
Purpose-built module for Photonic Doppler Velocimetry (PDV). A circulator, two VOAs and a passive coupler all built into one compact module.

**Passive Component Integration**
Integrate passive optical components of your choice such as WDM couplers, splitters, band-pass filters, PM beamsplitters and circulators. Models support SMF, MMF and PMF.

**Passive Component Storage**
Protect and store your own passive fiber optic components such as splitters, connector adaptors, patch cords, WDM couplers, and isolators in one handy module.

See our website for more details quantifiophotonics.com/products
WHY CHOOSE QUANTIFI PHOTONICS

Test. Measure. Solve™

Quantifi Photonics is transforming the world of photonics test and measurement. Our portfolio of optical and electrical test instruments is rapidly expanding to meet the needs of engineers and scientists around the globe. From enabling ground-breaking experiments to driving highly efficient production testing, you’ll find us working with customers to solve complex problems with experience and innovation.

To find out more, get in touch with us today.

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