BiLT System module: BE2812

High Stability Current Source ±15A ±8V

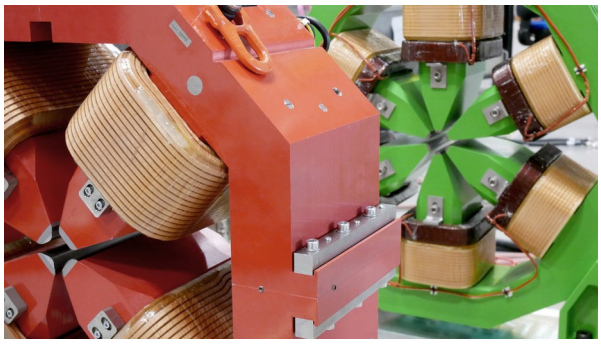
- ✔ *Magnet or Diode Power Supply*
- ✔ *Operates from 0µH to 20mH*
- ✔ *19 bits programming resolution*
- ✔ *Very high proven MTBF*

Main features

- Bipolar current source with no zero-crossing distortion
- Analog and digital control loops offer outstanding noise and stability performances
- Very Low noise: <25ppm peak-to-peak
- Voltage and current read-back
- Programmable current slope from 1A/s to 100A/s
- Parallelable power supplies for higher current
- No transient when powering on/off or switching on/off
- Safe stop even in case of power outage
- Proven MTBF > 1M hour
- Synchronization between multiple sources using:
  - module's hardware trigger input
  - chassis' hardware trigger input
- Custom version on-demand

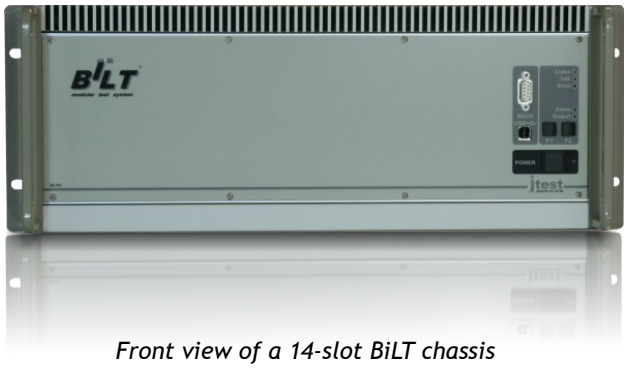
Application examples

- Magnet Power supply for beam correctors in particle accelerators
- Low noise supply for superconducting coils
- Alignment coils in Scanning Electron Microscope
- Laser or Power Diode biasing and ageing test



BiLT® System features

- Module to be inserted in a BiLT® chassis, 5 to 14-slot versions available, up to 1000W output power
- Cost effectiveness for multiple channels: up to 7 BE2812 housed into a single 19" BiLT® chassis
- Chassis standard interface: Ethernet and USB
- Complete software package provided, including a free turnkey control PC software (Windows™ or Linux) and NI Labview® driver. TANGO and EPICS drivers available

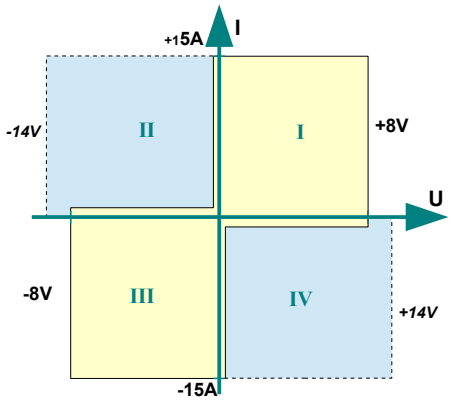


Front view of a 14-slot BiLT chassis

Operating Area

Parameters	Conditions/Comments	Min	Max
Current	Programming range	-15A	+15A
Voltage limit	Programming range (absolute value), source stops if exceeded	1V	8V
Load inductance		0µH	20mH
Source power	DC power		120W
Temperature[1]	Operating temperature range	10°C	40°C
	For rated long-term drift performances	15°C	30°C

(1) in front of the chassis rear openings, derate current if max. temp. exceeded.



Yellow: DC area, blue: transient area

For better performances, please contact us

Accuracy and Drift Performances

Parameters	Conditions/Comments	Specification
Programming resolution	including polarity bit	19bit (4ppm)
Differential linearity error	Guaranteed 19-bit monotonicity	2ppm
Integral linearity error		<150ppm
Long term drift (stability)[2]	After 30mn self-heating, at constant ambient temp. ±15A, for 8 hours	<20ppm
Thermal drift (TCR)	Max. value	±10ppm/°C
Absolute accuracy[1]	1 year, ppm of range + ppm of programmed value	±200ppm ± 600ppm
Line regulation	Line voltage steps between 180Vac and 230Vac	<2ppm
Read-back resolution	Current voltage	19 bits 16 bits

(1) Ambient temperature: 23°C±5°C
(2) drift figures are non cumulative. At lower current, performances are improved.

Dynamic Performances

Parameters	Conditions/Comments	Specification	
		Min	Max
Current Settling time[1]	Small step, at max. current slope	10ms	13ms
Current Slope	Programming range	1A/s	100A/s
Current Noise (ripple)[1]	0,1Hz-10Hz, peak-to-peak value 10Hz-10kHz, peak-to-peak value	8ppm 35ppm	
Current programming rate	Ethernet, USB		10Hz to 50Hz
	Internal buffer reading a recorded waveform	10Hz	200Hz

(1) Used loads: 20mH + 0,5Ω

Parallel operation

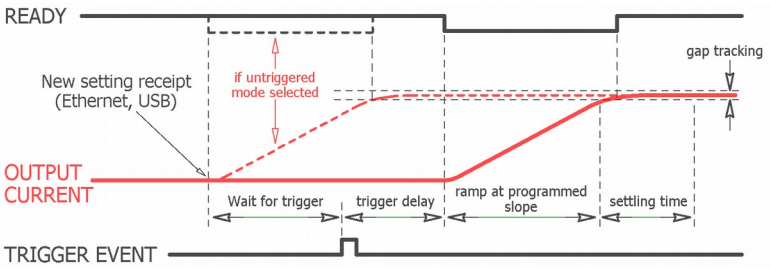
Several BE2812 current sources can be connected in parallel. Parallel operation requires no complex configuration. Any number of paralleled modules will be seen as a single power supply when using iTest control software or drivers. Outputs of several BE2812 can be directly connected together, thus easing cabling.

BE2812 module

Current setting control

The current setting update can be processed:
- Immediately upon new setting receipt
- Upon receipt of a trigger event:
    - software trigger sent by Ethernet
    - chassis BNC trigger input
    - module's trigger input

An additional optional programmable trigger delay (0 to 1000ms) can be used before updating the current setting.

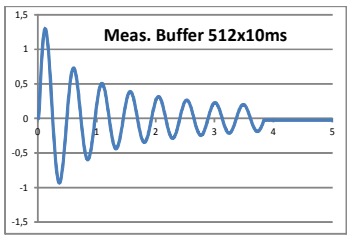


In any case, the current setting update is processed according to a programmable slope, useful for maintaining linear operation with large steps and large inductors.

A logic level "Ready" output signal indicates that the output update is in progress. It tracks the difference between the output current and the current setting. It sets to 1 when the difference is lower than a user programmable amplitude (down to 1 LSB).

Waveform Generator and measurement buffers

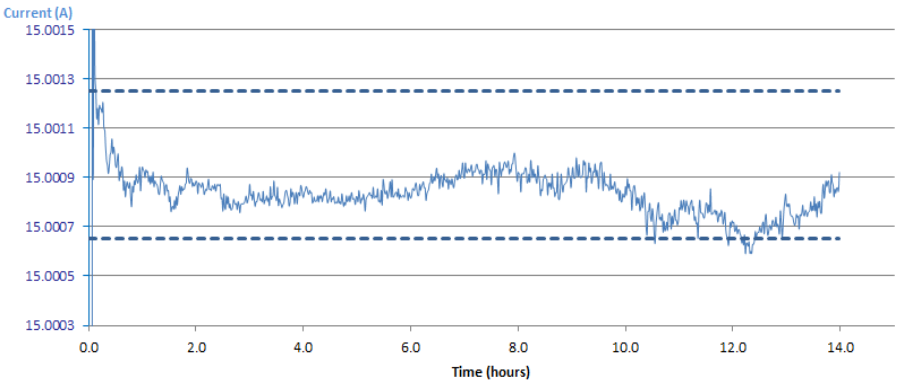
A 1024-sample current setting buffer allows the user to output any kind of waveform. The sampling period is programmable from 5ms to 100ms.
The buffer can be read once or looped for ever, the reading starts after a software or hardware trigger.
The waveform is processed according to the programmed current slope.



Three 512-sample measurement buffers are also available, starting to record after a software or hardware trigger. They use 3 different sampling periods: 1ms, 10ms and 100ms, providing a record duration of 500ms, 5s and 50s.

Stability test

Stability test run at constant ambient temperature, at a current setting of +15A, for 14 hours. The dashed lines show the 8-hour ±20ppm specification limit.



Connectors

- Industry-standard 3-way screw Terminal Block:
    - very reliable and long-life contact
    - up to 4mm² conductor
    - no crimping tool required
    - compatible with shielded or unshielded twisted pairs

• a 15-pin D-SUB connector including power output, voltage sense signals, trigger and status signals is also available for use in test benches. It is also compatible with twisted pairs.

Similar products

According to the customer needs, any other combination of specification can be used to design a new model.

Model	Current	Voltage	DC power	Application	Inductance range	Settling time	Noise	Drift	Module size
BE2710	±10A	24V	120W	Fast corrector or trim magnets	customizable	60µs	100ppm	100ppm	Double-slot
BE2720	±2A	50V	40W		customizable	75µs	100ppm	100ppm	Double-slot
BE2811	±5A	18V	100W	General purpose	0µH to 200mH	10ms	25ppm	<25ppm	Single-slot

Documentation			
BE2812 Brochure	1.8	129 March 2019	module data sheet / specifications and main features
BE2812 User Manual			module user manual including chassis, network, software, connections description
http://www.bilt-system.com/			bilt user manual and any other Bilt modules specification

Standards, Calibration, Warranty and Maintenance

Bilt system is compliant with the applicable European Directives and holds the CE mark.
Any iTest product comes with a two-year parts and labour guarantee and a calibration certificate if applicable. A telephone support service is also available for the same period.
Our calibration laboratory performs according to ISO/CEI 17025 "*General requirements for the competence of testing and calibration laboratories*". All measurements are traceable to the International System of Unit.
The recommended calibration interval of this product is 1 year.
On request, Itest can proceed to scheduled calibration (in our workshop or at the customer's site).
Maintenance can also be performed on-site or in our workshop.

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