BK MR Series

High Voltage Multi-Range DC Power Supplies

LXI
LAN eXtensions for Instrumentation

Choice Guide

Model	MR25080	MR50040	MR100020
Max. Output Voltage	250 V	500 V	1000 V
Max. Output Current	80 A	40 A	20 A
Max. Output Power	5000 W		

Overview

- Output up to **1000 V or 80 A**
- Multi-ranging operation
- Compact 2U form factor
- Standard USB, RS232, GPIB and **LXI compliant** LAN interfaces
- Analog control and monitoring interface
- Protection features: **OVP, OCP, OPP, OTP**, foldback protection mode, and **key-lock function**
- **Adjustable voltage and current slope** (rise and fall time)
- List mode: 10 user-defined setups with up to 100 programmable steps each
- **Built-in SAS function** for storage of up to 101 I-V curves with Voc, Isc, Vmp, Imp, parameters and 4096-point table
- **Remote Sense** to compensate for voltage drop
- **Master/Slave mode** operation provides **up to 50 kW with 10 units** connected in **parallel**
- **Control up to 30 power supplies** from one PC through RS485 communication ports
- Soft panel software for remote control, test sequence generation, and data logging included
- cTUVus certification mark (serves as an NRTL **equivalent to UL** and CSA)

Front Panel

Bright VFD display
The MR Series displays both measured output values and the set parameters simultaneously

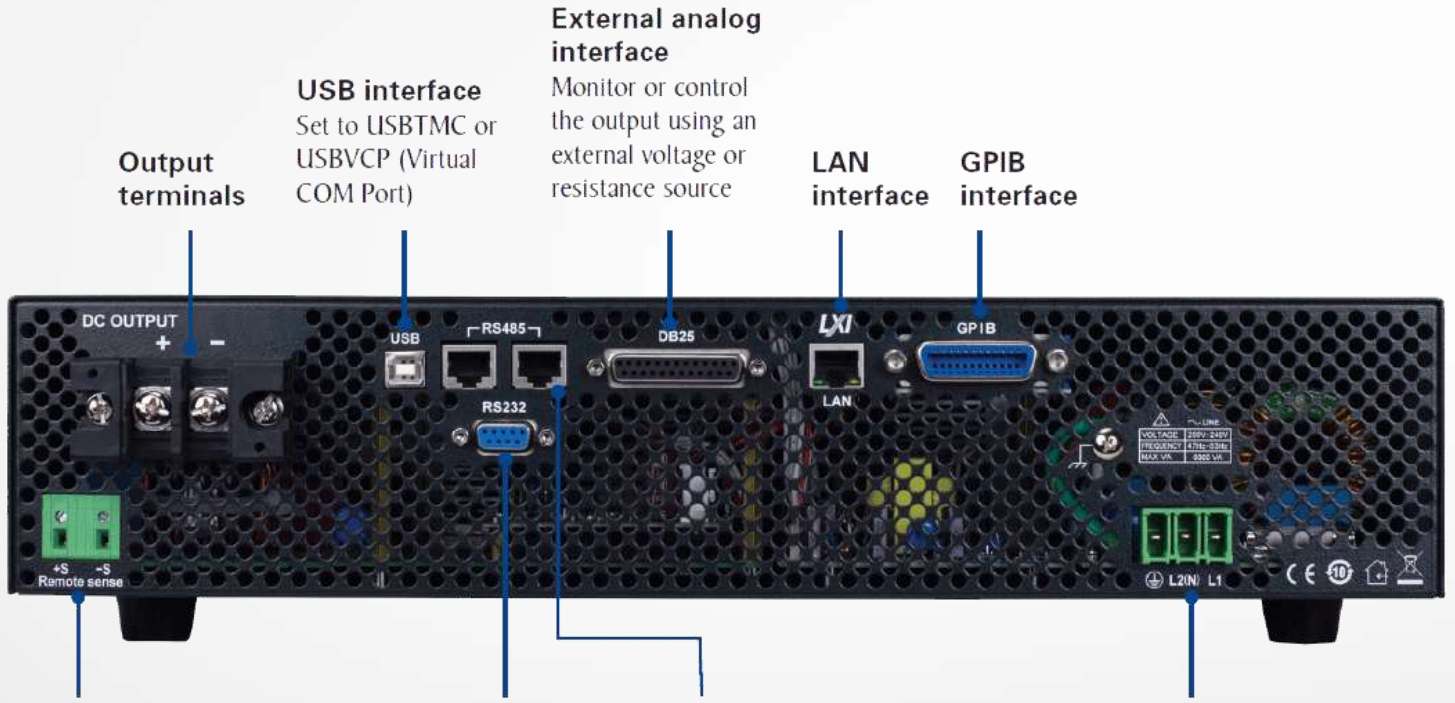
Numerical Keypad
Input values directly

Rotary control knob
Precisely increment and decrement input values

Thermostatically controlled fans
Front to rear airflow for efficient cooling in high density rack environments

Cursor keys
Quick voltage and current adjustment on a digit-by-digit basis

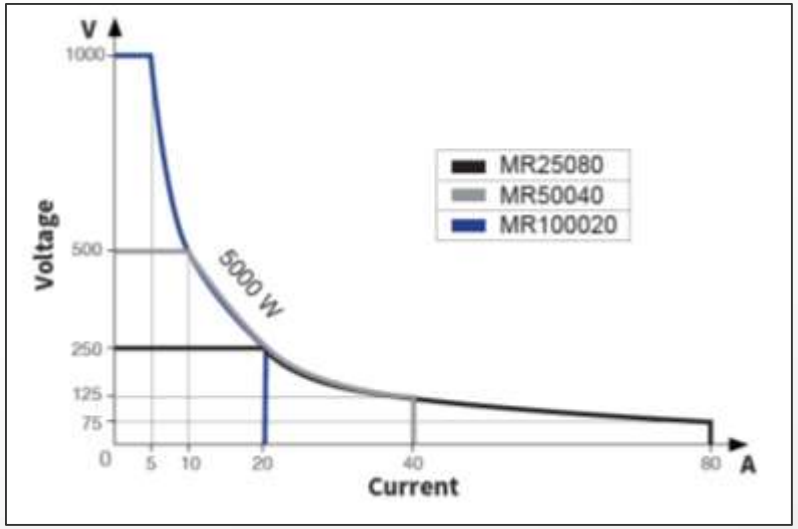
Rear panel


Output terminals
USB interface
Set to USBTMC or USBVCP (Virtual COM Port)
External analog interface
Monitor or control the output using an external voltage or resistance source
LAN interface
GPIB interface
DC OUTPUT
+
−
USB
RS485
RS232
DB25
LXI
LAN
GPIB
+S
-S
Remote sense
L2(N)
L1
Remote sense terminal
RS232 interface
Master/Slave communication ports
Connect multiple power supplies for more power
Single-phase AC line input
This series features a single-phase AC mains (200 VAC to 240 VAC nominal) connection which is easier to wire and more commonly available than 3-phase AC outlets.

Flexible configuration and performance

Multi-range operation:

Traditional power supplies with rectangular output characteristics only deliver maximum output power at one voltage/current point. Multi-range functionality broadens the maximum power output from one point to a range illustrated by the curves shown in the figure below. This flexibility means multi-range power supplies are capable of replacing multiple fixed range power supplies.



Flexible configuration and performance

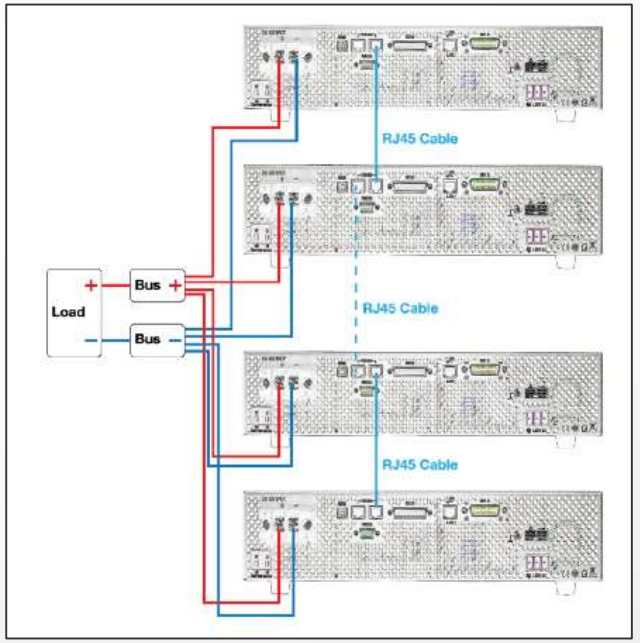
Device protection:

To protect your DUT, the MR Series provides overvoltage (OVP), overcurrent (OCP), overpower (OPP), and over temperature (OTP) protection. A fault will trigger an alarm and disable the output. Similarly, with constant voltage-to-constant current (CV-to-CC) or constant current-to-constant voltage (CC-to-CV) fold back protection mode activated, the output will be disabled if load changes force the supply to transition between the two operating modes.

Flexible configuration and performance

Master/Slave operation:

For more power, models with the same rating can be connected in parallel and operate in master/slave mode. The RS485 ports are used for communication between the master and slave(s). Once configured, the master will automatically search for and detect slave units and display the voltage and current of the complete system.



Flexible configuration and performance

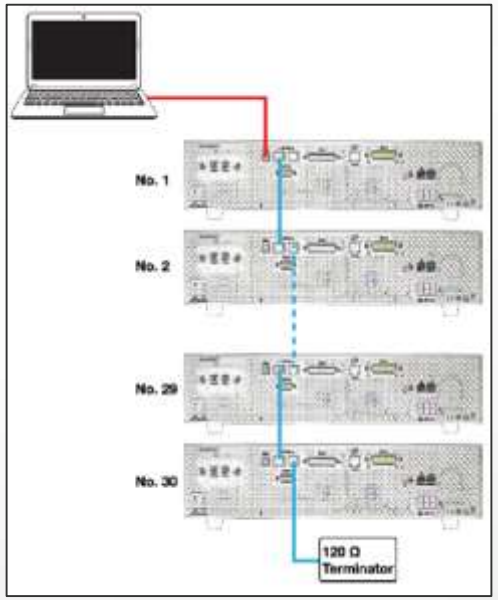
List mode:

This feature allows users to program a list of steps to the power supply's internal memory and execute them directly from the front panel. A total of 100 steps can be allocated to each internal memory location, for up to 10 locations. Each step setting includes voltage, current, duration and output status. List mode sequences can also be programmed remotely through the **USB, RS232, GPIB, or LAN interfaces** using SCPI commands or with the included application software.

Flexible configuration and performance

Multi-unit control:

Up to **30 units** can be daisy chained through RS485 and controlled from one master unit through the USB, GPIB, or LAN interface.



Remote control and programming

Adjustable slew rate and output timer:

Slew rate setting allows users to control the voltage and current slope (rise and fall times). The timer-controlled output can be set from 1 second to 255 hours.

Analog programming and monitoring:

In addition to front panel and remote interface control, the MR Series can be controlled from zero to full scale by an external voltage signal or resistor (0 to 5 V / 5 kΩ or 0 to 10 V / 10 kΩ selectable). The analog interface can also be used to monitor voltage, current, regulation mode (CV or CC), or to indicate fault conditions.

Remote control and programming

Web server interface:

The MR Series provides a built-in web server that allows users to configure, control, and monitor the basic settings of the power supply, using a web browser on a computer connected to the same local area network.

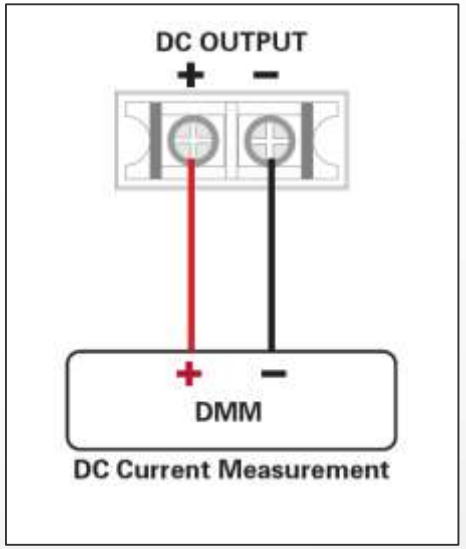
Socket and Telnet interface:

The power supply can be configured for Socket or Telnet connections through the LAN (Ethernet) and controlled using SCPI commands.

Remote control and programming

Convenient front panel guided calibration:

Using a 5 ½ digit multimeter, voltage and current parameters can be conveniently calibrated from the front panel via the calibration menu.



Remote control and programming

Application software and integration:

PC software is provided for front panel emulation, generating and executing test sequences, or logging measurement data without the need to write source code.

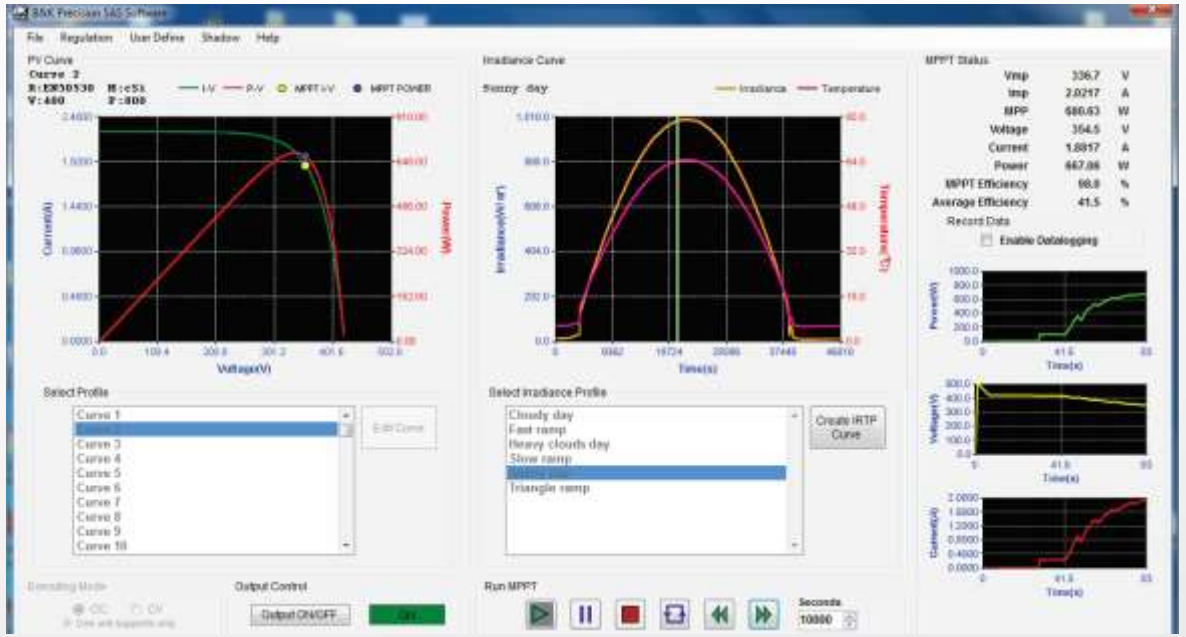
- Log voltage, current, and power values as well as time stamp, CV/CC, and output status.
- Save and load list files to/from the power supply's internal memory.
- Create an unlimited number of external list files to be executed from PC memory. Save and recall list files to/from the PC.

Solar Array Simulation (SAS) Software Option

Solar inverter designers need to verify their inverter is capable of delivering the maximum power available from solar modules. The I-V curve of solar cells can be influenced by various weather conditions such as a cloudy day. Combined with the SAS application software, MR users can easily simulate the I-V curve of different arrays under various irradiance conditions while measuring and validating the effectiveness of the inverter's MPPT algorithm.

Features:

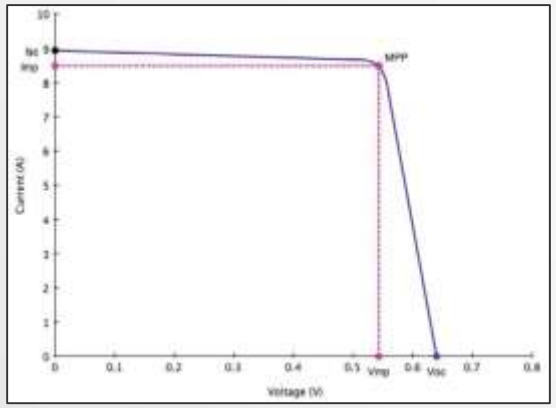
- Variety of input parameters (Voc, Isc, Vmp, Imp, and temperature coefficient)
- Monitors and logs real-time voltage, current, power, MPPT efficiency, and average MPPT efficiency
- Simulate I-V curve under different weather conditions during a day
- User-definable irradiance profile
- Generate a custom I-V curve with up to 4,096 data points
- Test to EN50530, NB/T32004, Sandia lab standards



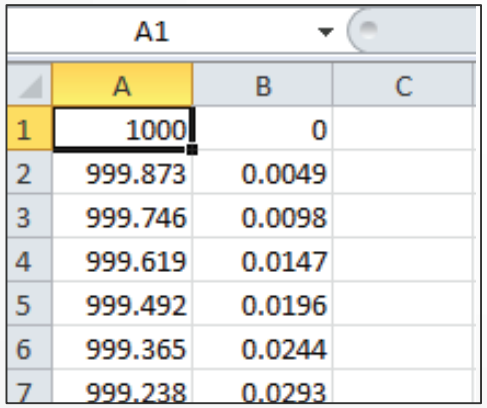
Solar Array Simulation (SAS) Software Option

PV Simulation:

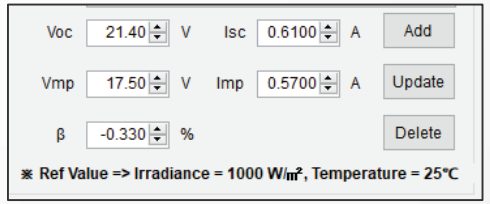
Solar arrays consist of multiple solar cells characterized by a complex voltage and current profile that is represented in an I-V curve.



The MR power supply outputs points on the I-V curve in 1 ms intervals to test the inverter's MPPT efficiency.



Generate custom I-V curves using Excel or Notepad to create a 4,096 point voltage and current table. Use the SAS software to download the I-V curve table to the power supply's internal memory for output.

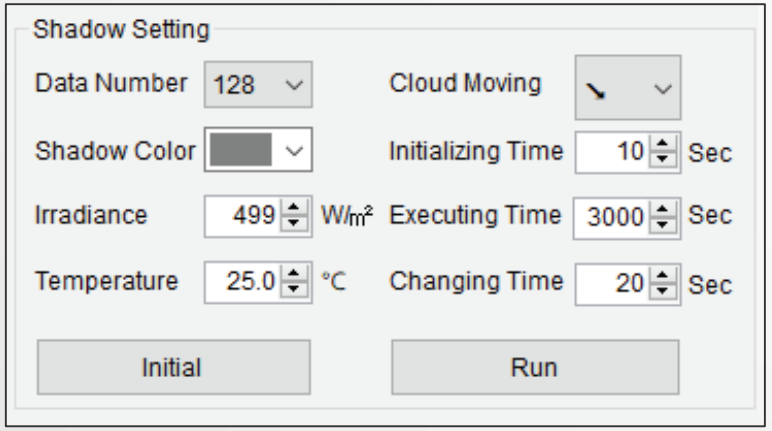


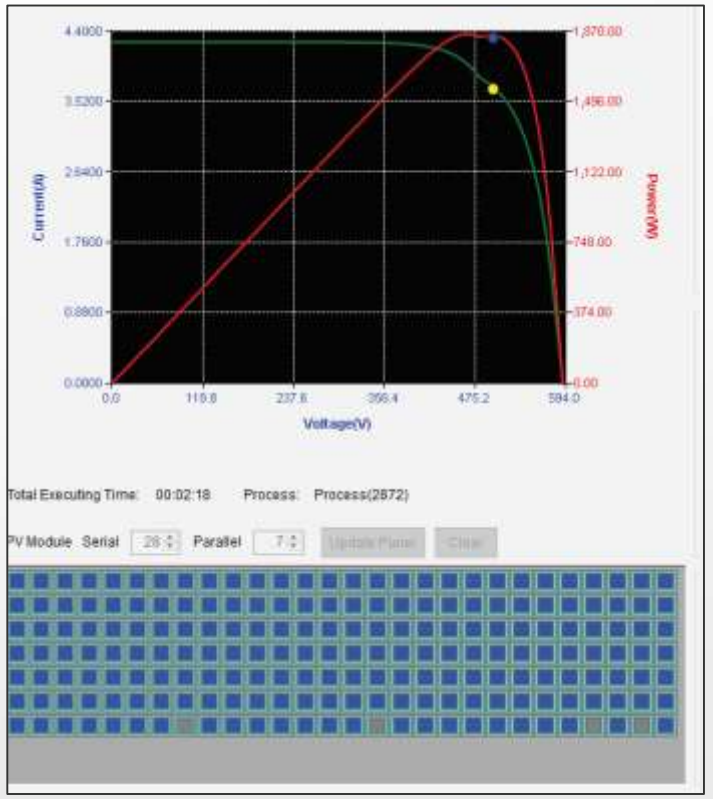
Automatically generate PV and I-V curves by specifying open circuit voltage (Voc), short circuit current (Isc), maximum power voltage (Vmp), and maximum power current (Imp) along with temperature coefficient (ß).

Solar Array Simulation (SAS) Software Option

Shadow Simulation:

Use the shadow simulation mode to test solar arrays under different weather conditions. Adjust cloud intensity, cloud direction, and timing parameters. Resulting PV and I-V curves are automatically generated along with MPPT efficiency data.





Accessories

Standard Accessories:

- AC power cord,
- User manual (downloadable),
- Certificate of calibration

AC input power cord (standard)

Rack mount kit model RKPVS (optional)

70 €

Optional Accessories:

- Rack mount kit (RKPVS) – 70 €
- SAS Software (SASPVS) – 291 €

Ordering Information

Model	MR25080	MR50040	MR100020
Max. Output Voltage	250 V	500 V	1000 V
Max. Output Current	80 A	40 A	20 A
Max. Output Power	5000 W		
Price	**5350 €**	**5350 €**	**5350 €**
Price per Watt	**1,07 €**	**1,07 €**	**1,07 €**

Comparison guide

Company	B&K Precision			Keysight	Chroma
Model	**MR25080**	**MR50040**	**MR100020**	**PVS10005 (not Multi-Range)**	**N8944A (N8900A series)**	**62050H-600S (62000H series)**
						
List price	**5.350,00 €**			**4.750,00 €**	**7.225,00 €**	**8.730,00 €**
Output Power	**5000 W**			**5000 W**	**5000 W**	**5000 W**
Cost-per-Watt	1,07 €			0,95 €	1,45 €	1,74 €
Key Features						
Multi-ranging (autorange)	✔			-	✔	✔
Output Rating	250 V / 80 A	500 V / 40 A	1000 V / 20 A	1000 V / 5 A	750 V / 20 A	600 V / 8.5 A
Load Regulation	120 mV / 50 mA	200 mV / 40 mA	250 mV / 25 mA	100 mV / 5 mA	375 mV / 30 mA	Voltage: ± 0.01% F.S. / Current: ± 0.05% F.S.
Ripple and Noise (20 Hz to 20 MHz)	500 mVpp / 20 mArms	600 mVpp / 10 mArms	700 mVpp / 5 mArms	600 mVpp / 10 mArms	800 mVpp / 16 mArms	1500 mVpp / 150 mArms
Rise Time at Full Load	30 ms	30 ms	30 ms	250 ms	30 ms	30 ms
Command Response Time	10 ms (typical)			20 ms	25 ms	20 ms
Programming Accuracy	100 mV / 60 mA	300 mV / 50 mA	500 mV / 25 mA	700 mV / (0.03% of output + 2 mA)	750 mV / 40 mA	600 mV / 25 mA
Protection	OVP / OCP / OTP / OPP			OVP / OCP / OTP / OPP	OVP / OCP / OTP	OVP / OCP / OTP
Internal List Programming	✔			✔	-	✔
LXI compliant	✔			-	✔	-
Solar Array Simulation	✔			✔	-	✔
General						
Form Factor	2U			2U	3U	3U
Standard I/O Interfaces	USB (TMC/VCP), LAN (LXI), GPIB, RS232, Analog			USB (VCP), LAN, GPIB, RS232, Analog	USBTMC, LAN (LXI), GPIB, Analog	USB, RS232, Analog
AC Input	Single-phase			Single-phase	Three-phase	Three-phase
Rack-mountable	✔			✔	✔	✔
NRTL[1] mark	cTUVus certification mark			-	cTUVus certification mark	-
Warranty	3 years			3 years	3 years	1 year

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