

RX

***Advanced Technology,
Legendary Performance,
Iconic Form!***

Xytronic Single-Phase Reference Standard

RX-10 | RX-11 | RX-15



Radian Research RX Reference Standards

Guaranteed Accuracy $\pm 0.04\%$, $\pm 0.02\%$ or $\pm 0.01\%$

R A D I A N
Research

RX-10

± 0.04%

RX-11

± 0.02%

RX-15

± 0.01%

Xytronic Single-Phase Reference Standards

Nearly four decades ago Radian Research revolutionized the portable electric energy reference standard market with the RM-10 Metronic Portable Watthour Standard. Word spread quickly and soon there were stories about the incredible measurement accuracy and precision coming from this magical little blue box. A legend was born. Exceptional performance combined with the iconic cube shape led to the RM standard often being referred to simply as a RADIANT. In electric meter shops and labs around the world, RADIANT is synonymous with STANDARD.



- **Accurate, Precise and Stable**
- **For Meter Site, Shop, Lab and Engineering**
- **Over 40 Simultaneous Metrics, 80 Total**
- **Wide Operating Range**
- **Directly NIST and NRC Traceable for AC Energy**
- **Familiar, Intuitive User Interface**
- **Voltage and Current Harmonics with THD**
- **Light Weight, Compact and Rugged**

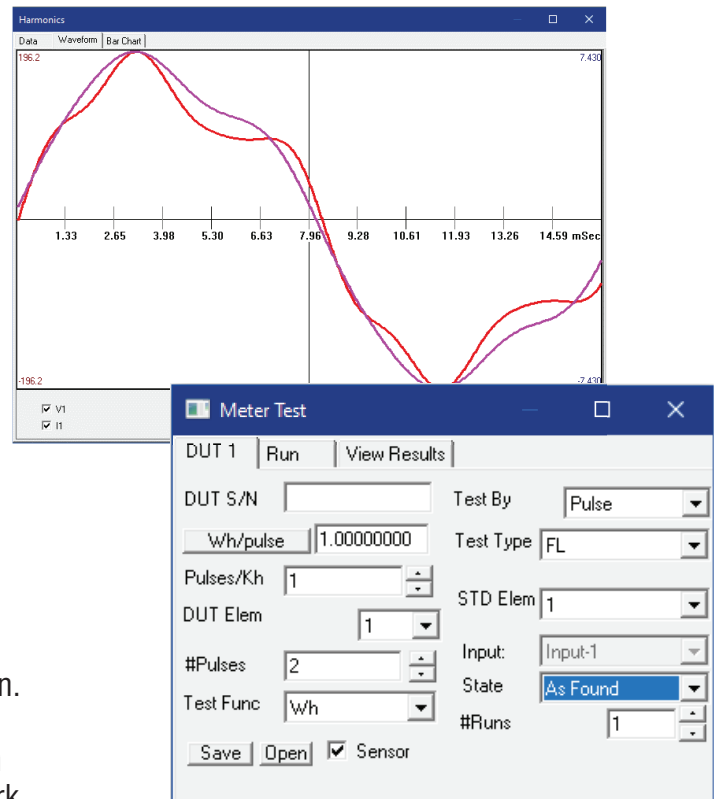
Measurement Certainty Radian Research is the leader in assuring the integrity of AC electric energy measurement. RADIAN Power and Energy Reference Standards are respected worldwide for their legendary accuracy, precision and stability. Xytronic technology utilizes high performance analog to digital converters coupled with RADIAN's renowned signal sensing technology, hermetically sealed references, and enhanced calculation algorithms to set a new standard for power and energy measurement. RADIAN RX standards are available in 0.04%, 0.02%, and 0.01% models, the RX-10, RX-11 and RX-15. These guaranteed accuracies include the variables of stability, traceability, uncertainty, and test system errors. RADIAN's ISO 17025, A2LA accredited laboratory maintains direct traceability to the National Institute of Standards and Technology (NIST) and the National Research Council (NRC) for AC energy. NIST and NRC traceability is recognized and respected by other National Metrology Institutes around the world.

Vast Metrics The RX-10, RX-11, and RX-15 are four-quadrant, single-phase instruments that provide simultaneous measurement of voltage, current, phase angle, power, and energy (active, reactive, and apparent). All metrics are available as traditional wideband or fundamental, where the latter filters out any harmonic content from the input signals. Delivered and received energy metrics are reported independently. Support for six different reactive (VAR) calculation methods along with the addition of vector VA metrics further distinguishes the RX standard. The RX-10, RX-11, and RX-15 compute and present over 40 reference caliber metrics concurrently. Power quality metrics include harmonics and THD for voltage and current. This vast metric set makes the RX Standard one of the most powerful measurement engines ever.

Diverse Applications The unique design and flexibility of the RX-10, RX-11, and RX-15 make it conducive for numerous electric metering applications. At a meter site, use it with a controlled current source to test revenue billing meters. In the meter shop, as a secondary standard to certify the accuracy of meter Test Boards. In the meter lab, calibrate Reference Standards of lesser accuracy, a linchpin in the chain of standardization for energy measurement. The 0.01% accuracy RX-15 is suitable to serve as a company master standard. In meter engineering, as an invaluable tool for evaluation, analysis, and design of any power or energy related instrument or system. Whatever your application, the RX-10, RX-11, and RX-15 will meet your needs.

Enhanced Control and Communication The RX-10, RX-11, and RX-15 provide superior control and communication over that of the RD platform. Standard Command Programming Interface (SCPI) is used to communicate to the RX-10, RX-11, and RX-15. It is fast and provides easy connectivity using standard protocols. SCPI is based on industry standards, is easy to program and provides comprehensive access to all RX functionality. SCPI allows time-synchronous measurements of harmonics, metrics, and waveforms across all phases/axes. Ethernet is used for programmatic control of the RX using SCPI as well as for software updates.

Legacy Software Support The RX-10, RX-11, and RX-15 provide backwards compatibility with software that was developed for the RD platform. This includes support for PC-Suite version 5.0. PC-Suite is a simple but powerful tool to provide access to tools including metrics, harmonics, waveforms, meter test, standard test, trending and automation. The RX-10, RX-11, and RX-15 support the legacy serial communications commands from the RD series standards. In general, almost any program written to control an RD will work with an RX-10, RX-11, and RX-15.



Ideal Replacement for RM or RD Standa



Incredible Range The RX-10, RX-11, and RX-15 operate over a broad measurement and temperature range making it one of the most versatile Reference Standards available. Autoranging voltage inputs of 30-600 VAC and currents of 20 mA to 225 A provide flexibility to operate in a large variety of power and energy applications. The RX Standard's ability to maintain exceptional accuracy at temperature extremes makes it suitable for virtually any measurement environment.

Familiar User Interface The RX-10, RX-11, and RX-15 utilize a five-button keypad with a backlit LCD as its direct user interface to easily view metrics and setup device parameters. RADIAN duplicated the highly popular interface of the RD Standards to further ensure a smooth transition to the RX platform. Use the built in comparator to test a meter or other Reference Standard and the test results will be automatically calculated.

Revitalize Vintage Equipment The RX-10, RX-11, and RX-15 were specifically designed and are ideally suited for upgrading existing test equipment. Its CLASSIC cube shape and traditional connection scheme enable simple retrofit of field test sets and meter shop Test Boards. Bring your vintage test equipment to life with a new RADIAN RX-10, RX-11, or RX-15 Xytronic measurement engine.



Accessories

PICK UPS & SENSORS



193060, RR-IRDS - Infrared and Meter Disk Sensor Combo, Field Mount

110168, RR-IR/s - RR-IR Optical Pickup (Suction Cup)

110169, RR-IR/m - RR-IR Optical Pickup (Magnet)

100127, RR-KYZ - Pulse Input Adapter with 4-pin plug (3 Wire and 2 Wire)

190168, RR-LOI - Low AC current input device which allows direct AC current input from 0.8mA to 800mA



100105, RM-1H - Optical Pickup for Infrared LED - BNC Connector

100120, RM-1H/v - Optical Pickup for Visible LED - BNC Connector



100110, RM-KYZ - Pulse Input Adapter (3 wire) - BNC Connector

OTHER ACCESSORIES



100112, RM-OA - Optical Adapter for Meter Communication Port

1700538 - Cable USB to Serial Port 6 feet

191070 - 6' RS-232 Communication Cable



RM-111 - Automated Comparator

SOFTWARE & INTERFACE ADAPTERS



PCSuite 5 - Testing and Analysis PC software for RX Standards

Interface

Screen Display:	Integrated 3.25", Backlit LCD Screen
I/O Ports: Communication Interface Port / Protocol	Serial RS-232 / Supports RADIANT Legacy RD Commands (Required adapter supplied) Ethernet / Standard Commands for Programmable Instrumentation (SCPI) Protocol
Optical Sensor Port	4 Pin Lemo (Optional Optical Accessories Available)
Bidirectional Programmable Pulse/	Input Termination 128 Ohm/1 kOhm Pull Up to 5 V, Max External Pullup +27V
Frequency Comparator BNC Ports	Input Gate rate 200 nS Pulse Width Minimum, Maximum 20 Hz Repetition Rate
Outputs 1, 2: (Default = 0.00001 Wh/Pulse)	BNC Short Circuit Tolerant, Programmable Kh Value/direction/in/out Nominal 5 V, Open Collector Compatible, Max. 27V, Max. 2.1 MHz (200nS Pulse Width Minimum) Selectable Watt Hours, VAR Hours, VA Hours.
Direct AC Current (I) Inputs	Range: 20 mA to 75 Amp (x3) Termination: 6 mm Female, Indirect Current (External CT Input) Max. input: 1 Amp Termination: 7 Pin Female Redel Connector
Potential (U) fused Inputs	Range: 30 V to 600 V (60Hz), 30 V to 525 V (50Hz) 1M Ohm Input Impedance Termination: 4 mm Female Protection: 500mA Fused
Cable Accessories	1m Potential Cables (supplied) Unterminated 100A

General

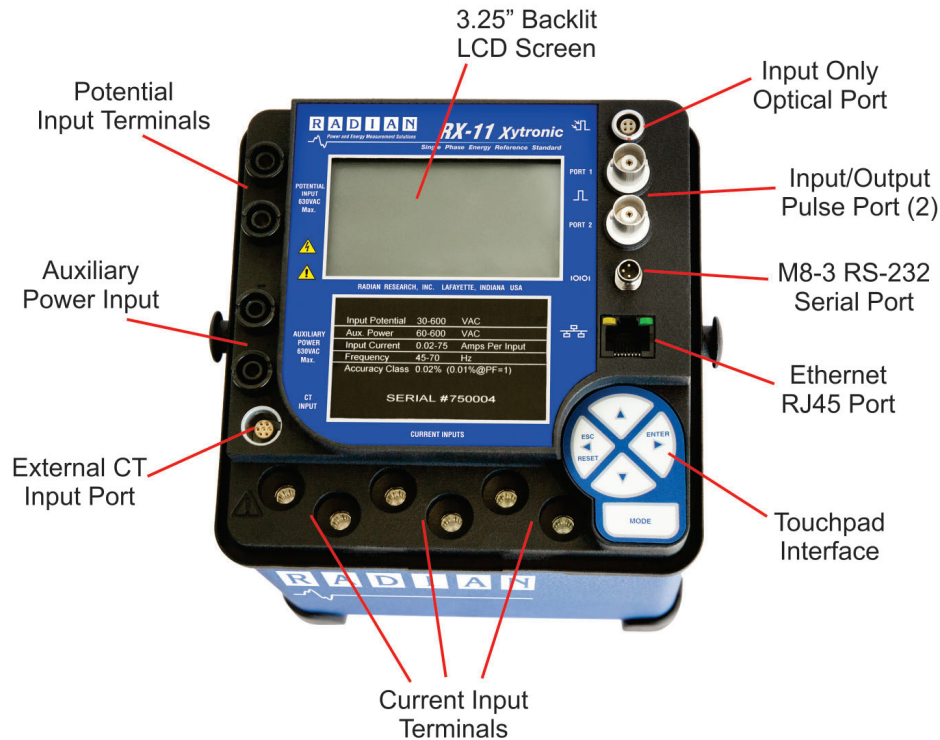
Dimensions	5.5" (139 mm), 7.5" (190 mm)
Weight	5 lbs (2.5 kg)

Safety

IP Class	IP30 (According to DIN EN 60529)
Hi-Pot & Surge	IEC 61010-1
Fused Potential Input	500 mA Ultrafast - SIBA 70.172.40.0.500 or Equivalent

Environment

Ambient Temperature Range	Storage... -40° C to +80° C Operating... -20° C to +70° C Specified Accuracy... -20° C to +70° C (RX-10 & RX-11) and 0° C to +40° C (RX-15)
Humidity	0% to 95% Non-condensing
Vibration	All Non-destructive
Aux Voltage	60 to 600 VAC Autoranging
Power Consumption	~25 VA max.
Warm-up	30 Seconds



RX Specifications

Function	Reading	% Accuracy (ppm) ^{3,9} TCAL ¹ ±5°C			% Accuracy (ppm) ³ at Power Factor=1			Stability (ppm √ Month)			17025 Cal Uncertainty (ppm)	Temperature Coefficient ⁷ (ppm/°C)
		RX-10	RX-11	RX-15	RX-10	RX-11	RX-15	RX-10	RX-11	RX-15		
Potential (U)	30 V to 600 V ⁶	0.02% (200)	0.01% (100)	0.005% (50)				8	4	2	30	1.5
Direct AC Current (I)	20 mA to 75 A ²	0.028% (280)	0.014% (140)	0.007% (70)				12	6	3	50 ⁸	3
Power ^{4,5}	0.6 kw - 47.2 kw	0.04% (400)	0.02% (200)	0.01% (100)	0.02% (200)	0.01% (100)	0.005% (50 ppm)	16	8	4	50 ⁸	5
Energy ^{4,5}		0.04% (400)	0.02% (200)	0.01% (100)	0.02% (200)	0.01% (100)	0.005% (50 ppm)	16	8	4	50 ⁸	5
Phase Angle	0° to 360°	0.008°	0.005°	0.003°								
Frequency	45 Hz to 65 Hz	0.0001% (1)	0.0001% (1)	0.0001% (1)				0.3	0.3	0.3		0.05

Notes:

¹ TCAL = 23°C

² 75 Amp per input (225 Amps total using three inputs)

³ Total Expanded Uncertainty in accordance with ISO/IEC Guide 98-3:2008

Includes variables of Stability, Crosstalk, and Traceability Uncertainty

Accuracy represents expanded uncertainties expressed at the 95% level of confidence using a coverage factor of k = 2

⁴ For Power Factor < 0.5, ± (0.01% / PF) Maximum

⁵ For ≥ 1 Second Integration Time

⁶ Maximum 30 V to 525 V at 50 Hz

⁷ Maximum -20°C to +70°C (RX-10 & RX-11)

⁸ For Power Factor = 1 Cal Uncertainty = 30 ppm

⁹ For Power Factor >0.5 to <1