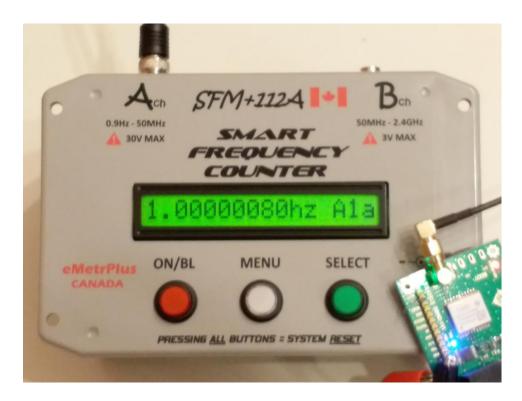
User Guide for eMetrPlus Universal Reciprocal Frequency Counter/Meter (SFM+112A, SubVer: A10+)



eMetrPlus SFM+112A is a Universal Reciprocal Frequency Counter/Meter, and can display Equal High Resolutions from LOWEST to HIGHEST of measurable frequencies. Frequency Range: 0.8999999Hz-(<0.9Hz) to 2.4000001GHz+ (typical >2.7GHz). At 50/60Hz (Mains Power Frequency) the Finest Resolution is 1uHz (0.000001Hz), the Units Hz, KHz, MHz, GHz, S, mS, uS, nS etc. are also Directly Displayed. Ultra Stable 16MHz TCXO, SFM+112A Basic Accuracy (0C to 45C) = 0.5PPM + 1 Count. SFM+112A is a Dual Function PORTABLE/BENCH equipment and can be used without plugging into a Mains AC Outlet. The STN LCD Display is Ultra LARGE, SHARP & BRIGHT (Character Height >0.3inches with LED BackLight). The SFM+112A operates through an Extremely User Friendly MENU-Based Interface with 3 Front Buttons.

SPECIFICATIONS for eMetrPlus SFM+112A UNIVERSAL RECIPROCAL FREQUENCY COUNTER/METER

Consistent 8 Digits Equal-Precision from Lowest to Highest of Measurable Frequencies [finest resolution@1Hz = 0.1uHz; finest resolution@2GHz = 0.1KHz].

Frequency Range: ChA(Hi-Impedance): 0.8999999Hz- (<0.9Hz) to 105.000001MHz+ (>110MHz typical); ChB(50 Ohm): 49.999999MHz- (<50MHz) to 2.4000001GHz+ (>2.7GHz typical).

Ultra Stable 16.00000MHz TCXO Time Base, Accuracy/Tolerance MAX +/- 0.5PPM (-30C to +85C), Aging per Year MAX +/- 1.0PPM.

SFM+112A Readout Basic Accuracy = Time Base Accuracy (0.5PPM) + 1 count.

Normal Operation Range: Temperature 0C to 45C, Humidity <95%.

SFM+112A is Factory Calibrated at 25C.

Recommended TCXO Warm-Up Time: 5mins (after powering up from OFF mode).

Portable/Bench equipment, uses Batteries [6 X AA: Alkaline or Pre-charged Re-chargeable] And/Or with 9V DC Adaptor (OPTIONAL) [(9V, 300-800mA, Unregulated), DC plug type (5.5 x 2.1mm, Center Positive +)]; e.g. (JAMECO, 9VDC-600mA, 120VAC-60Hz, Product NO: 202180, Model NO: DCU090060).

Battery Life (6 X AA, Alkaline) OPERATION Mode: >60Hr with 5Min BL (Backlight ON time).

Battery Life (6 X AA, Alkaline) OFF Mode (Shutdown/Sleep Mode): >1.5 Year.

LOW BATT Indication: "bat" shows on Right side of LCD Display on Alternate readout cycles when Last 10% of Battery Life is reached.

Ultra LARGE, SHARP & BRIGHT LCD Display, Character Height >0.3 inches with Yellow/Green Backlight. Backlight Function: Constant ON/OFF with DC Adaptor (OPTIONAL), ON with $\sim 5+$ Sec Timer with Battery Only.

Number of LCD Contrast Settings: 12

Auto Ranging Input Channels: A, B via BNC Female Input Connectors.

Attenuator Function [Input A Only]: X1() = NO Attenuation, X10(a) = Attenuate by 10.

Input Channel A: 0.9Hz to 105MHz+ (>110MHz typical), AC Coupling, Input Impedance: [(1Mohm | <30pF) at Attn =X1(_)], [(110Kohm | <30pF) at Attn =X10(a)].

Input A MAX Input Voltage (Continuous): 30Vrms.

Input A Momentary (Accidental) MAX Input Voltage (Short Time, Low Frequency): 350Vrms (<15Sec, <300Hz).

Selection A1: Low Pass Filter engaging; normal operation [0.9Hz to 900Hz, Sensitivity \sim 100mVrms]; extended operation [0.9Hz \sim 9KHz].

Selection A2: Middle Pass Filter engaging; normal operation [900Hz to 1MHz, Sensitivity <50mVrms]; extended operation [0.9Hz \sim 9MHz].

Selection A3: High Pass Filter engaging; normal operation [(1MHz to 50MHz, Sensitivity <50mVrms), (50MHz to 80MHz, Sensitivity <100mVrms)]; extended operation [90KHz \sim 110MHz].

Input Channel B: 50MHz to 2.4GHz+ (>2.7GHz typical), AC Coupling, Input Impedance: 50ohm; extended operation [9MHz $\sim 2.7GHz$].

Input B MAX Input Voltage (Absolute): 3Vrms.

Sensitivity: [(50MHz to 1.2GHz, <15mVrms), (1.2GHz to 2.4GHz, <45mVrms)].

Readout Mode: FREQUENCY in Hz, KHz, MHz, GHz; PERIOD in S, mS, uS, nS.

Sampling Time: 0.1Sec, 0.5Sec, 1Sec, 5Sec, 10Sec.

Data Hold Function: Long Press MENU Button or Long Press SELECT Button.

System Reset Function: Pressing ALL 3 Buttons simultaneously will SYSTEM RESET the SFM+112A.

GUIDELINES/TIPS in using eMetrPlus SFM+112A Universal Frequency Counter/Meter

After installing 6 X AA batteries, Rotate & Push each Battery towards its Positive Terminal in the battery holder to ensure good electrical contact.

9V DC Adaptor (OPTIONAL) does NOT recharge Battery, and Battery power is NOT consumed when both DC Adaptor (OPTIONAL) & Battery are both applied.

Selection A1 is engaging an Input Low Pass Filter and Selection A2 is engaging an Input Middle Pass Filter, while Selection A3 is engaging an Input High Pass Filter.

For an input signal of say 1.1 KHz, selecting A1 means more input High Frequency noise Filtering than selecting A2 and vise versa.

For an input signal of say 900 KHz, selecting A3 means Filtering Out more input Low Frequency contents than selecting A2 and vise versa.

Attenuator Function is supposed to be turned ON =X10(a) when the Input Signal is very strong, but somehow the reading can be more stable if the Attenuator Function is turned OFF = $X1(_)$, since using Attn = $X1(_)$ means that the Input Sensitivity is Higher and creates a Sharper Turn On & Turn Off signal edge. Whether it is better to use Attn =X10(a) or Attn = $X1(_)$ for a relatively strong input signal (>3Vrms) depends on actual trial & error. For not so strong input signal, use of Attn = $X1(_)$ is generally recommended.

For Low frequencies (<900Hz), e.g. (@50/60Hz), the Best Readout (finest resolution etc.) occurs when the Input Amplitude is around (5VRMS / 14VPKtoPK).

The selectable Sampling Times are 0.1S, 0.5S, 1S, 5S & 10S.

Normally a longer Sampling Time will give more Average/Stable Readings, while a shorter Sampling Time will give more Frequent/Responsive/Quicker/Instant Readings.

Pressing All 3 Buttons will System Reset the SFM+112A, and will Reset All Selections to Default values.

SPEC for 1601 LARGE CHARACTER LCD MODULE RC1601C

Large Character Dot-Matrix LCD Display with Yellow/Green LED Backlight.

16 Characters x 1 Line.

LCD type: Yellow Green, STN Positive, Transflective, 1/16 Duty.

View direction: 6 o'clock.

Module dimension: 122.0 x 33.0 x 13.5 (max) mm3.

Active Display Area: 94.84 x 9.66 mm2.

3 BUTTON MENU FUNCTION TABLE for eMetrPlus SFM+112A				
		ON/BL Button	MODE/MENU Button	SELECT Button
LONG	in DATA	ON/OFF	HOLD	HOLD
PRESS	Readout		Readout	Readout
LONG	in MENU	ON/OFF	NO	NO
PRESS	Display		Function	Function
SHORT	in DATA	BackLight	1ST	CURRENT
PRESS	Readout		Menu	Mode
SHORT	in MENU	BackLight	NEXT	NEXT
PRESS	Display		Menu	Mode

You can reconfigure, manufacture & sell/market this product. Licensing cost is USD30/unit Negotiable.

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