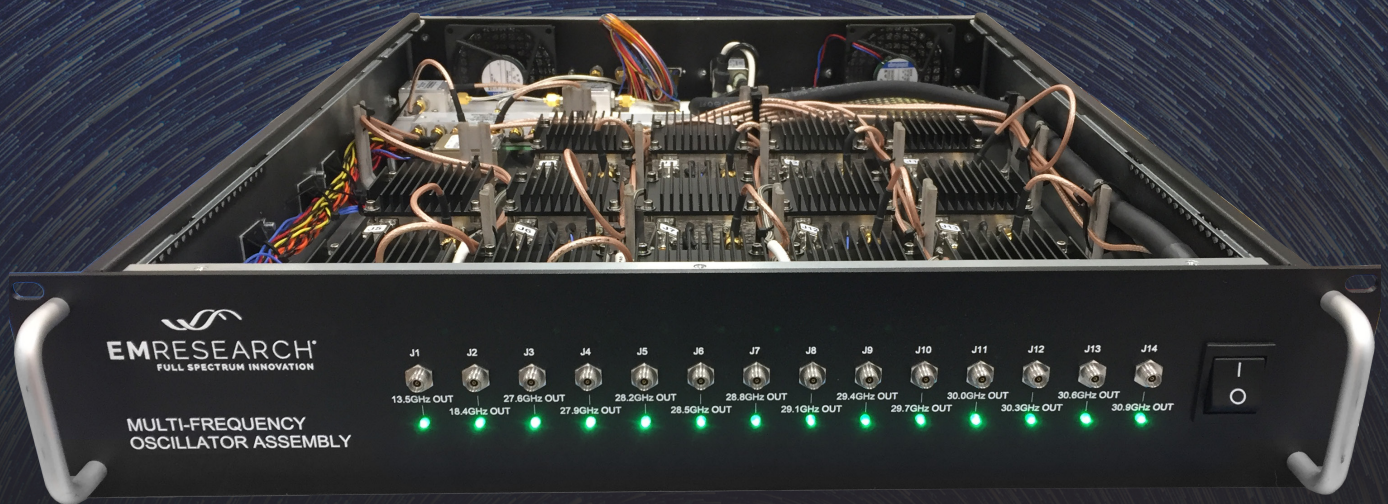




EMRESEARCH<sup>®</sup>  
FULL SPECTRUM INNOVATION



# INTEGRATED MICROWAVE ASSEMBLIES

PRODUCT GUIDE





Founded in 1991, EM Research has been delivering high performance frequency synthesizers and signal converters for a broad range of applications worldwide. Since our inception we have developed an extensive library of products. We are your ultimate source for frequency generation, signal conversion, and integrated microwave assemblies.

The products presented in the Integrated Microwave Assemblies Product Guide are only **samples** of our growing library. Browse the full spectrum of our products on our website.

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# INTEGRATED MICROWAVE ASSEMBLIES CONTENTS

## MULTI-TONE SOURCES

---

|                  |   |
|------------------|---|
| MTS SERIES ..... | 4 |
|------------------|---|

## IQ MODULATORS

---

|                  |   |
|------------------|---|
| IQM SERIES ..... | 5 |
|------------------|---|

## IQ DEMODULATORS

---

|                  |   |
|------------------|---|
| IQD SERIES ..... | 5 |
|------------------|---|

## AMPLIFIERS

---

|                  |   |
|------------------|---|
| SAM SERIES ..... | 6 |
|------------------|---|

## REFERENCE-MULTIPLEXERS

---

|                  |   |
|------------------|---|
| MOX SERIES ..... | 6 |
|------------------|---|

## TRANSCEIVERS

---

|                   |   |
|-------------------|---|
| TCVR SERIES ..... | 7 |
|-------------------|---|

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# MULTI-TONE SOURCES

## MTS Series | Multi-Tone Source

The Ultimate Laboratory Solution

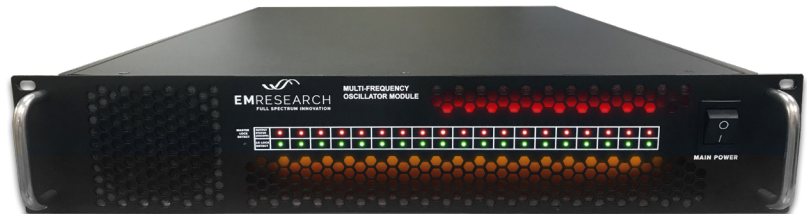


Customizable, the MTS is simple to implement in any system.

The MTS-31000-01 has up to 14 independent fixed output frequencies and excellent phase noise using our ESP Series frequency synthesizers.

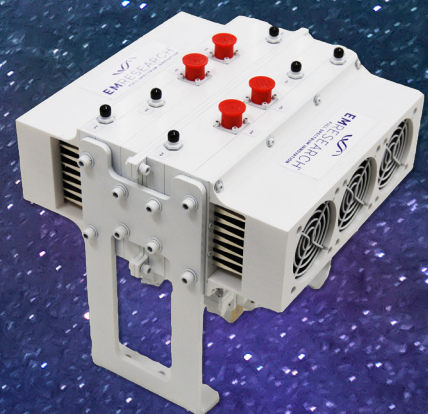
The MTS-7000-01 has up to 19 independent frequency synthesizers in combinations of our fixed SLFS Series and our programmable THOR Series.

The MTS features an easy to read front panel with LED lock indication. Internal fans and heatsinks keep all components within operating temperature range.



## FULL SPECTRUM CUSTOM ASSEMBLIES

EM Research was founded on building unique solutions to challenging problems. We take pride in engineering the impossible and creating custom designs for our customers. We constantly challenge ourselves to reach for the stars and push the limits of the RF/Microwave industry.



TCVR SERIES  
Page 7



# IQ MODULATORS | IQ DEMODULATORS

## IQM Series | IQ Modulator

### Features

- Capable of receiving from DC to 500 MHz, and LO inputs and outputting RF frequencies
- Internal low noise oscillator
- Internal reference
- Buffered modulator
- Balanced IQ
- Optimized for low EVM



### Options

- Internal Reference Detect Switch (EM Research RDS series).
- Internal low noise LO
- Up to 250 mega symbols per second

### Models

| Model***    | Input Frequency (MHz) | Output Frequency (MHz) | Output Waveform (QAM/QPSK) | Output Power (dBm) | Phase Noise (dBc/Hz) |        |         |
|-------------|-----------------------|------------------------|----------------------------|--------------------|----------------------|--------|---------|
|             |                       |                        |                            |                    | 1 KHz                | 10 KHz | 100 KHz |
| IQM-1250-02 | 1150                  | 1150 ± 500             | 256                        | -20                | -115                 | -120   | -125    |
| IQM-1650-02 | 1525                  | 1525 ± 500             | 256                        | -20                | -110                 | -115   | -130    |

## IQD Series | IQ Demodulator

### Features

- Capable of receiving RF and LO frequency inputs, and outputting from DC to 500 MHz
- Internal low noise oscillator
- Internal reference
- Buffered demodulator
- Balanced IQ
- Optimized for low EVM



### Options

- Internal Reference Detect Switch (EM Research RDS Series).
- Internal low noise LO
- Up to 250 mega symbols per second

### Models

| Model***    | Input Frequency (MHz) | Output Frequency (MHz) | Output Waveform (QAM/QPSK) | Output Power (dBm) | Phase Noise (dBc/Hz) |        |         |
|-------------|-----------------------|------------------------|----------------------------|--------------------|----------------------|--------|---------|
|             |                       |                        |                            |                    | 1 KHz                | 10 KHz | 100 KHz |
| IQD-1250-02 | 1150                  | 1150 ± 500             | 256                        | -20                | -115                 | -120   | -125    |
| IQD-1650-02 | 1525                  | 1525 ± 500             | 256                        | -20                | -110                 | -115   | -130    |

\*\*\*REPRESENTATIVE MODEL FROM A VAST LIBRARY OF OPTIONS

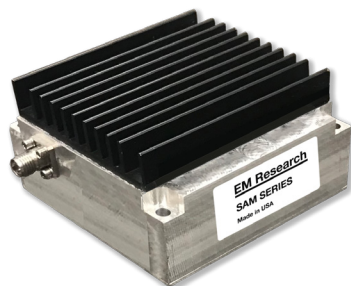


# AMPLIFIERS | REFERENCE-MULTIPLEXERS

## SAM Series | Synthesizer Amplifier Modulator

### Features

- Compact universal amplifier
- Frequency output range tuned to match choice of synthesizer
- Low harmonics



### Options

- Optional gain level select
- Tight gain flatness  $\pm 1$  dB over 100 MHz to 6 GHz
- Extended temperature range available
- 0.5, 1, or 2 watts of power
- 5 watt design in development

Optimally paired with EM Research multi-band synthesizers including the MBS, MBS-XC, and the SBC Series. The SAM Series of amplifiers boosts output power over the same bandwidth as a connected synthesizer. The powerful SAM Series has a minimum RF output power of 0.5 watts.

## MOX Series | Master Oscillator Multiplexer

### Features

- Low phase noise OCXO
- Reference (1-100 MHz)  
L-Band (900-2200 MHz)  
DC (to +48 V @ 4 A) Bias Tee/Multiplexer
- Interface between VSAT Modems and Frequency Converters
- Robust housing is gasket sealed for weather resistance



### Options

- Available in various OCXO frequencies: 10, 50, 100, 120 MHz
- OCXO with low G-sensitivity available
- Single or Dual Multiplexer
- Single or Dual Bias Tee

### Models

| Model***  | Frequency (MHz) | Stability (ppb)                    | Aging (ppb/year)       | Phase Noise (dBc/Hz) |        |         | VCC (V) | ICE (mA) |
|-----------|-----------------|------------------------------------|------------------------|----------------------|--------|---------|---------|----------|
|           |                 |                                    |                        | 1 KHz                | 10 KHz | 100 KHz |         |          |
| MOX-10-02 | 10              | $\pm 5 \times 10^{-8}$ (0C to 50C) | $\pm 1 \times 10^{-9}$ | -157                 | -160   | -160    | +15     | 350      |
| MOX-50-02 | 50              | $\pm 10$ (-15C to +55C)            | $\pm 200$              | -160                 | -165   | -170    | +15     | 600      |

\*\*\*REPRESENTATIVE MODEL FROM A VAST LIBRARY OF OPTIONS



## TCVR Series | Transceiver

### Features

- 4 watts linear power
- Transceiver pair support dual polarization
- Low EVM
- Outdoor unit IP68 compliant
- Compliant to RTCA-DO-160G
- Concept/Eval unit tested to 1024-QAM



### General Specifications

- Digital interface: 4-wire SPI (3.3 V Logic)
- Supply voltage: +12 VDC,  $\pm 0.25$  V
- Operating temperature range:  $-45^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Current:
  - 2400 mA TYP, 20 dBm Out
  - 3500 mA TYP, 33.5 dBm Out

The TCVR Series is a Ka band transceiver, utilizing extremely high digital modulation levels resulting in exceptionally fast broadband data rates. It is in a compact, easy to install configuration. The TCVR Series has been unit tested up to 1024 QAM, 230 MHz channels.

## BTP SERIES BUILD TO PRINT

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