

REM1000

Redundant Edge Matrix

The REM1000 (Redundant Edge Matrix) provides an automatic RF signal routing solution for APEX1000 RF port level redundancy.

The REM1000 is an RF switch that is used with the APEX1000 EQAM to support RF port level redundancy. It enables RF port redundancy across two separate APEX1000 units by providing automatic RF signal routing in the event of a failure of a single RF port in either attached APEX1000 unit. This eliminates the need to change physical RF wiring if an APEX RF port fails.

The REM1000 is a switch device used to provide RF port switching for the APEX1000. The REM1000 has 22 RF ports (12 inputs and 10 outputs), and supports up to two APEX1000 devices in a 1 RU chassis. All six RF outputs from an APEX1000 connect to inputs on the REM1000. The sixth REM1000 input is redundant and only routed to an output when one of the ports connected to inputs #1 through #5 fail, providing 1:5 redundancy for each connected APEX1000. This allows the operator to switch APEX1000 outputs without re-wiring the cables connected to the plant. If a port fails on the APEX1000, the APEX will internally route the output transport streams from the failed RF port to the backup port. The APEX1000 will signal a switch event to the REM1000 over either a dedicated FastE link or through the OAM&P network (operator configuration dependent) to indicate which output port has failed. The APEX1000 will issue SNMP traps indicating that an RF failure occurred and subsequently, an RF failover occurred.

Physical Chassis

1 RU chassis with 12 RF input ports, 10 RF output ports, 3 Fast Ethernet interfaces, and an RS-232 Console Port. The REM1000 is orderable with either an AC or DC power supply.

RF Wiring

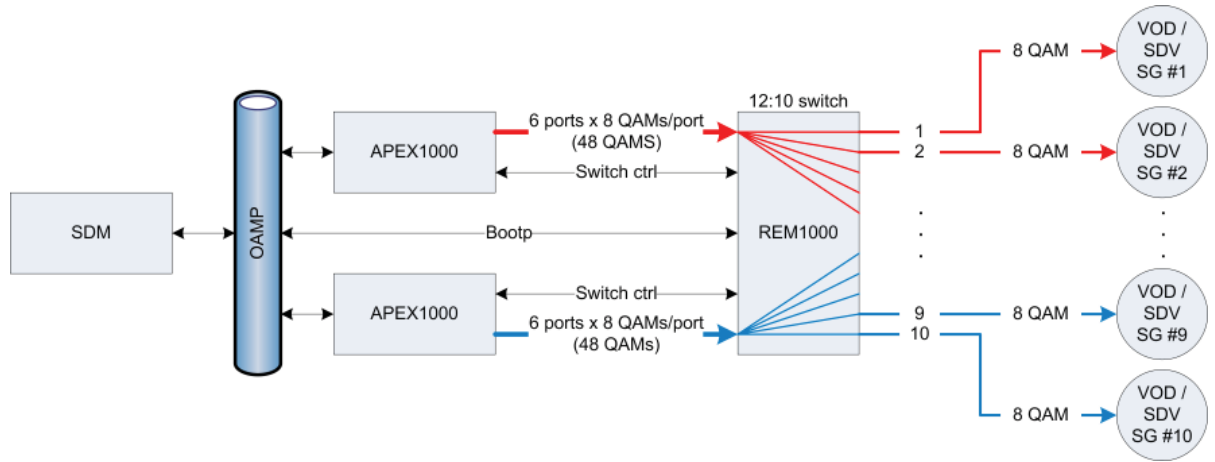
The REM1000 has 12 physical RF input ports allowing it to receive RF inputs from up to two separate APEX units (6 RF ports per APEX). Each APEX provides 5 primary RF inputs and 1 backup RF input. The REM1000 then provides 10 RF outputs (5 per APEX unit) at the output

RF Port Level Redundancy with the REM1000

The REM1000 and APEX1000 redundancy scheme provides the following high-level features:

- Protects against APEX RF module failure (across 2 connected APEX units)
- Eliminates need to re-wire RF cables if APEX RF module fails
- Each APEX provides up to 5 primary RF outputs (up to 40 QAM channels) when redundancy is enabled
- REM1000 switch supports two APEX1000 units
 - 6 RF inputs per APEX, 6th RF input is redundant
- REM1000 is not single point of failure (failed REM is passive, so RF signals continue to pass through)
- REM1000 provides multiple modes of control
 - Direct Connect — Each APEX1000 connected directly to dedicated REM1000 interface.
 - Common Connect — Each APEX1000 connected through OAM&P hub to REM1000 OAM&P interface.

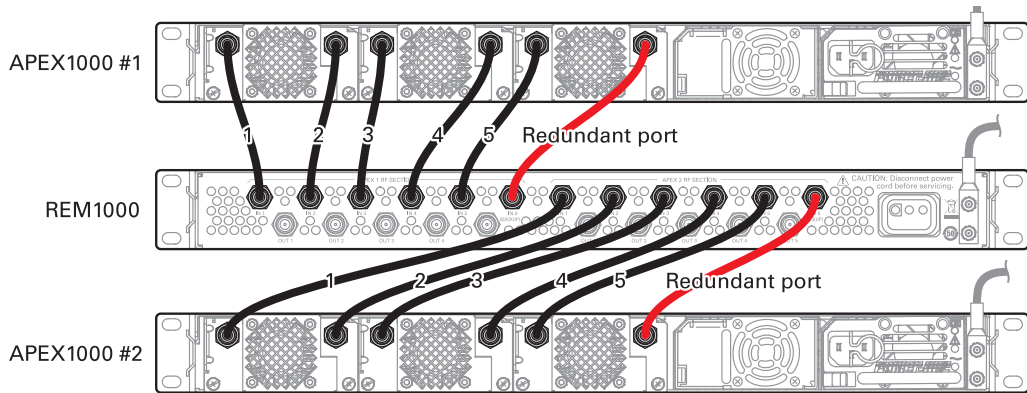
SPECIFICATION SHEET
 REM 1000
 Redundant Edge Matrix



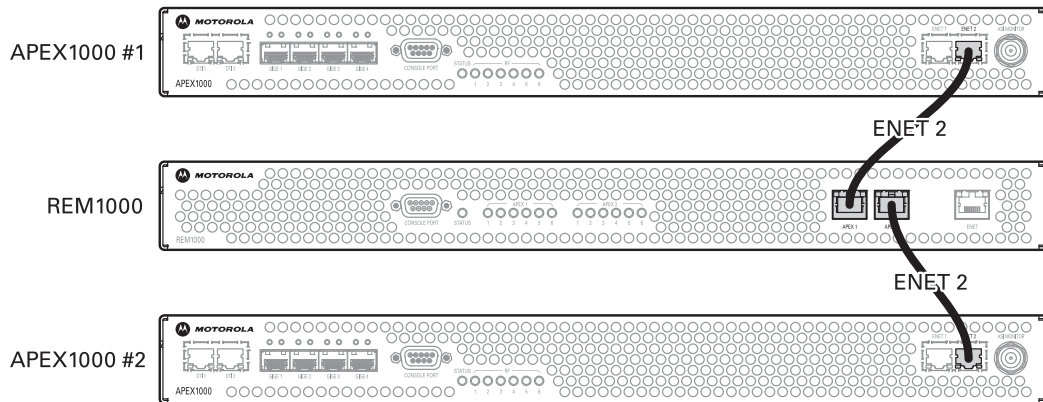
Recommended APEX1000 to REM1000 RF port configuration

The configuration diagrams below show the RF and control connection wiring between the REM1000 and two connected APEX1000 units.

REM and APEX1000 RF Wiring Configuration



REM and APEX1000 Control Connections



SPECIFICATION SHEETREM 1000
Redundant Edge Matrix**Specifications****MODULAR CHASSIS**

Chassis Height	1 RU
Dimensions	1.75 in x 19.0 in x 25 in
Weight	9 pounds

POWER

Power Supplies	One per chassis
Hot Swappable	No
Configurations	One AC or one DC
AC Power Supply	90 to 240 VAC, 50/63 Hz
DC Power Supply	-40 to -60 VDC
Power Consumption	< 11 W total

ENVIRONMENTAL

Operating Temperature	0 °C to 50 °C
Storage Temperature	-40 °C to +70 °C
Cooling	Natural Convection
Operating Altitude	-200 feet to 10,000 feet AMSL
Operating Humidity	5% to 95%

RF PERFORMANCE

Input Ports	12 RF Ports
Output Ports	10 RF Ports
Designated Backup Inputs	2 RF Ports (of the 12)
Insertion Loss	
Direct Path	0.25 dB (typical)
Redundant Path	0.65 dB (typical)
Port-to-Port Isolation	>70 dB

OTHER INTERFACES

Fast Ethernet Ports	Three RJ-45 Ethernet ports
Console Port	One RS-232 port

REM1000 Part Numbers

Component	Description	Part Number
REM1000 AC	Includes one REM1000 chassis with AC power supply	567225-001-00
REM1000 DC	Includes one REM1000 chassis with DC power supply	567225-002-00

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