PRODUCT OVERVIEW:
The Touchstone DOCSIS 3.0 16x4 Embedded Multimedia Terminal Adaptor (E-MTA) TM1602 delivers two lines of primary line Voice over IP (VoIP), ultra-high speed data access, and multiple battery pack options to support telephony service during power outages. Designed as an upgradeable solution for advanced users, the TM1602 enables both home and small businesses the speed and performance achievable with a 24x8 bonded channel cable environment along with industry-leading ARRIS voice and battery back-up features. With the TM1602, cable operators can maintain competitive position against VDSL and fiber to the home services by offering subscriber data services as high as 960Mbps.
**GENERAL SPECIFICATIONS**

**Physical**
- Operating Temperature °F (°C): 32 to 104 (0 to 40)
- Operating Relative Humidity (Min-Max): 5-95% (non-condensing)
- Storage Temperature °F (°C): -40 to 158 (-40 to 70)
- Dimensions (H x W x D): TM1602G: 9.1x2.2x7.0 (23.1x5.5x17.9) in. (excluding F-connector)
- Unit Weight in lbs (kg): TM1602A: 1.11 (0.50), TM1602G: 1.39 (0.63) – not including battery
- Battery Pack Weights in lbs (kg): 8-Hr Pack: Li-ion 2.2 AH Capacity, 0.25 (0.11), 12-Hr Pack: Li-ion 4.4 AH Capacity, 0.50 (0.22), 16-Hr Pack: Li-ion 8.8 AH Capacity, 1.0 (0.44)
- Battery Storage Temperature °F (°C): -4 to 140 (-20 to 60)
- Battery Telemetry (TM1602 only): AC Fail, Battery Low, Battery Missing, Replace Battery
- Diagnostic LEDs: Power, US/DS, Online, Tel1, Tel2, Battery (TM1602G only)

**Interfaces**
- RF Interface: External 75 ohm F type connector
- Data Interface: 10/100/1000 Base-T Ethernet RJ-45
- Telephony Interface: Two (2) RJ-11 jacks
- Battery interface: Custom male connector, rectangular, 2mm

**Telephony**
- Input Voltage (nominal): 115 VAC, 60 Hz
- Supervisory Voltage: 48 VDC nominal
- Maximum Loop Length to CPE: 1000 ft (305M) of 26 AWG (0.4 mm) wire
- Ringing Load Capacity: 10 REN total, 5 per line
- Provisionable High Loop Current Mode: Yes (40mA constant current source)
- Telcordia™ GR 1089 Tested: Yes
- Programmable Country Interface: Yes (support for multiple country templates)

**RF Downstream**
- Frequency Range (MHz): 108-1002 (edge-to-edge)
- Bonded Channels: Up to 16 (24 with separate downstream license)
- Tuner Configuration: Full capture tuning range
- Modulation (QAM): 64 or 256
- Data Rate (Mbps, Theoretical): Up to 640 (960 with 24 downstream license) max raw DOCSIS rate, actual throughput is less due to overhead, configuration, and RF conditions
- RF Input Sensitivity Level (dBmV): -15 to +15
- Carrier Bandwidth: 6 MHz
- MoCA® Immunity Filter: Yes

**RF Upstream**
- Frequency Range (MHz): 5-42 (A/NA, G/NA) or 5-85 (G/NA-85 versions)
- Bonded Channels: Up to 4 (8 with separate upstream license)
- Modulation: QPSK, 8QAM, 16QAM, 32QAM, 64QAM, 128QAM (5-COMDA only)
- Modulation Bandwidth (MHz): TDMA: 200, 400, 800, 1600, 3200, 6400
- Data Rate (Mbps, Theoretical): up to 120 (240 with upstream license) max raw DOCSIS rate, actual throughput is less due to overhead, configuration, and RF conditions

**RF Upstream (continued)**
- TDMA: +17-61 (QPSK), +17-58 (64QAM), +17-57 (32QAM, 64QAM)
- S-CDMA: +17 to +56 (all modulations)

**Note1:** A-TDMA max output reduced 3dB when transmitting 3 channels (6dB when transmitting 2 channels). Extended US power compensates at higher bonding levels to ensure max output does not drop below +5dBmV.

**Note2:** S-CDMA max output reduced 3dB when transmitting 2 or more channels.

**Standards**
- DOCSIS 3.0 Certified
- FCC Part 15 Class B
- ICES-003
- Telcordia 782369
- Telcordia™ GR-1089
- RFS2261 Legacy SIP
- ITU-T K.21
- UL® 60950 / CB
- RoHS / WEEE

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
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<tbody>
<tr>
<td>1000179</td>
<td>TM1602AP2/NA, 16x4, DOCSIS 3.0 compliant 2-Line E-MTA, integrated 115 VAC 60 Hz power supply, 6 ft NEMA 1-15 power cord. Includes Quick Install Guide, and Ethernet cable. Incapable of battery support. Upgradeable to 24x8 operation with separate license (Part# 782204)</td>
</tr>
<tr>
<td>782369</td>
<td>TM1602G/NA-0, 16x4, DOCSIS 3.0 compliant, 2-Line E-MTA, integrated 115 VAC 60 Hz power supply, 6 ft NEMA 1-15 power cord. Includes Quick Install Guide and Ethernet cable. Battery capable (no battery pack included). Upgradeable to 24x8 operation with separate license (Part# 782204)</td>
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<tr>
<td>783946</td>
<td>TM1602G/NA-8, 16x4, DOCSIS 3.0 compliant, 2-Line E-MTA, integrated 115 VAC 60 Hz power supply, 6 ft NEMA 1-15 power cord. Includes 4-cell, 4.4 AH, Li-Ion Battery for up to 8 hrs of battery back-up, Quick Install Guide, and Ethernet cable. Upgradable to 24x8 operation with separate license (Part# 782204)</td>
</tr>
<tr>
<td>783947</td>
<td>TM1602G/NA-16, 16x4, DOCSIS 3.0 compliant, 2-Line E-MTA, integrated 115 VAC 60 Hz power supply, 6 ft NEMA 1-15 power cord. Includes 8-cell, 8.8 AH, Li-Ion Battery for up to 16 hrs of battery back-up, Quick Install Guide, and Ethernet cable. Upgradeable to 24x8 operation with separate license (Part# 782204)</td>
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<tr>
<td>783992</td>
<td>TM1602G/NA-BS-0, 16x4, DOCSIS 3.0 compliant, 2-Line E-MTA, 5-85MHz US, integrated 115 VAC 60 Hz power, 6 ft NEMA 1-15 power cord. Includes Quick Install Guide and Ethernet cable. Battery capable (no battery pack included). Upgradeable to 24x8 operation with separate license (Part# 782204)</td>
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<tr>
<td>783991</td>
<td>TM1602G/NA-BS-8, 16x4, DOCSIS 3.0 compliant, 2-Line E-MTA, 5-85MHz US, integrated 115 VAC 60 Hz power supply, 6 ft NEMA 1-15 power cord. Includes 4-cell, 4.4 AH, Li-Ion Battery for up to 8 hrs of battery back-up, Quick Install Guide, and Ethernet cable. Upgradeable to 24x8 operation with separate license (Part# 782204)</td>
</tr>
<tr>
<td>783990</td>
<td>TM1602G/NA-BS-16, 16x4, DOCSIS 3.0 compliant, 2-Line E-MTA, 5-85MHz US, integrated 115 VAC 60 Hz power supply, 6 ft NEMA 1-15 power cord. Includes Quick Install Guide, and Ethernet cable. Upgradable to 24x8 operation with separate license (Part# 782204)</td>
</tr>
</tbody>
</table>
| 804015 | Unit License for Upgrade from 16x4 to 24x8 on TM1602C PEM

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