

Internet Cable solutions for Small & Medium networks

FOCUSED ON VERY SMALL, SMALL AND MIDDLE SIZE CABLE NETWORKS DAMERY OFFERS YOU A COMPLETE RANGE OF CMTS'S FROM 40 MBITS TO 160 MBITS

DAMERY Cable Modem Termination System (CMTS) family is a high-performance, scalable, cost-effective solution for small and medium sizes cable networks.

Its modular design allows cable operators to interoperate cost effectively with standard CATV and DOCSIS-compliant equipments.

DAMERY CMTS Family complies with the Data over Cable Service Interface Specification (DOCSIS) 1.0 & 1.1 standards (**JADE**), (DOCSIS) 2.0 standards (**OPAL**) and (DOCSIS) 3.0 standards (**CORAL**).

DAMERY product lines include the models for outdoor usage (BK Models).

Interoperability with any DOCSIS compliant cable modem is assured



It opens the door to dependable high-speed service such as high-speed Data including controlled Quality-of-Service (QoS), Cable Telephony (VoIP), and Streaming Video services between cable modem subscriber and the data network.

Any **DAMERY** CMTS supports Simple Network Management Protocol (SNMP) for easy administration.

- ✓ **Full System Scalability**
- ✓ **Low-cost initial deployment**
- ✓ **DOCSIS/Euro-DOCSIS 1.1/2.0 Compliance**
- ✓ **Operations Support (SNMP and Telnet)**
- ✓ **Remote Control**
- ✓ **Quality of Service provisioning**
- ✓ **Security**
- ✓ **DHCP Relay, Option 82, IP Helpers**

DAMERY CMTS family can be used in single, stand alone configuration or stacked with **ProBmo** provisioning server to provide from 40 Mbits to 160 Mbits bandwidth range.

| | | |
|------------------------|----------------------|---|
| Up to 40 Mbits | Single (D / E) 1.1 | 1U- JADE - 1DS/1US |
| | Single (D / E) 2.0 | 1U- OPAL - 1DS/2US |
| Up to 80 Mbits | Stack (D / E) 1.1 | 3U - JADE - 2DS/2US + PROBMO Server |
| | Stack (D / E) 2.0 | 3U - OPALS2 - DS/4/8US + PROBMO Server |
| | Single (D / E) 3.0 | 1U - CORAL - 2DS/4US + PROBMO Server |
| Up to 160 Mbits | Stack (D / E) 2.0 | 5U - OPALS4 - 4DS/8/16US + PROBMO Server |
| | Single (D / E) 3.0 | 6U CORAL - 4DS/8US + PROBMO Server |

Using Damery CMTS, it is possible to start for a minimum investment using DOCSIS 1.1 features. When more bandwidth is needed the possibility to stack several units with ProBmo, provisioning server, or to upgrade to higher Docsis standard remains as most cost effective solution.

CMTS FAMILY



- Single, stand alone, all in one
- Stacked with Provisioning Server



ProBmo Provisioning server.

The single, stand alone configuration has an integrated provisioning software module (OnProMo) running onboard.

OnProMo on board OSS features

- **Web access, User Admission**
- **Monitoring, SNR graphs**
- **Provisioned Registration**
- **DHCP/TOD/TFTP/HTTP services**
- **QoS management & automatic configuration file generation**
- **Prepaid, post-paid traffic limited, Billing option**

Great Performance



CORAL

Small, simple, modular

DAMERY CONTACT INFO

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6110 Montigny-le-Tilleul (Belgium)
Company n° 0811.007.201
www.damery.be

JADE excels in speed performances



Speed test with PC connected directly to hub

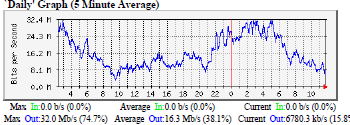
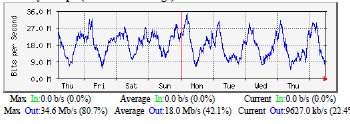
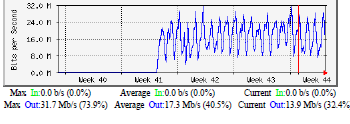
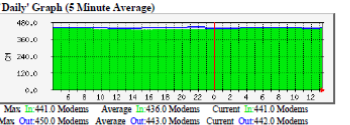
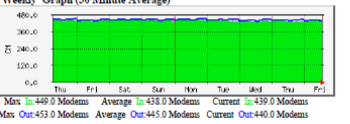
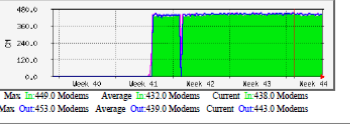
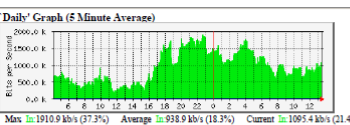
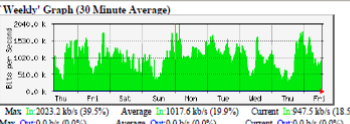
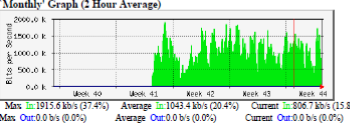


Speed test with PC connected to a modem, via a single JADE CMTS

Specifications : Tiny JADE

| RF Specifications | Network and Security | Environnemental |
|---|---|--|
| <p>Downstream</p> <ul style="list-style-type: none"> ➤ Bandwidth by channel: 6 MHz or 8 MHz ➤ Modulation: 64QAM, 256QAM ➤ Error Correction: Reed Solomon ➤ Frequency Range: 88 MHz to 860 MHz (Optional extended range up to 1000 MHz)) ➤ Spectral Occupancy: 64 QAM: 0.18 SRRC 256 QAM: 0.12 SRRC ➤ Return Loss: 14 dB ➤ Output Impedance: 75 ohms <p>Integrated up converter option:</p> <ul style="list-style-type: none"> ➤ Output RF level: 50 to 60 dBmV ➤ Output frequency range: 88 MHz to 880 MHz <p>Upstream</p> <ul style="list-style-type: none"> ➤ Modulation: QPSK, 16QAM ➤ Error Correction: Reed Solomon ➤ Frequency Range: 5MHz to 65MHz agile, in 100Hz steps ➤ Symbol Rate: 160, 320, 640, 1280, 2560 ksym/s ➤ Input Level: 0 dBmV -15 dBmV | <p>Network Management</p> <ul style="list-style-type: none"> ➤ SNMP ➤ MIB Group: MIB II, DOCSIS MIB, Vendor-Specific MIB ➤ DHCP Relay ➤ Option 82 ➤ IP Helpers ➤ PPPoE ➤ Telnet <p>Media-Access-Control (MAC)</p> <ul style="list-style-type: none"> ➤ DOCSIS 1.0, DOCSIS 1.1 ➤ DOCSIS 1.1 features <ul style="list-style-type: none"> ➤ Fragmentation ➤ Payload Header suppression ➤ Concatenation ➤ Quality-of-Service Controls ➤ High-Performance Scheduler ➤ Rule-based packet filtering upstream and downstream <p>Network Interfaces</p> <p>10/100 Base-T Ethernet (RJ45 CAT-5)</p> | <p>Environmental parameters</p> <ul style="list-style-type: none"> ➤ Operating temperature 0°C ~ 40°C ➤ Storage temperature -25°C ~ 60°C ➤ Humidity 10 % ~ 90 % (non-condensing) <p>Power Supply</p> <p>Full range switching power supply</p> <p>On board ProMo OSS</p> <p>Available on board on all type of CMTS up to 500 users</p> <ul style="list-style-type: none"> ➤ Web access ➤ User Admission ➤ Configuration file building ➤ Support - Provisioned Registration ➤ DHCP/TOD/TFTP/HTTP services ➤ Subscriber and modem data base management ➤ Billing option: Prepaid, post-paid traffic limited ➤ Monitoring, SNR graphs ➤ CM/CPE/ IP History ➤ CMTS configuration |

OPAL has excellent performances and stability on site

| CATV Downstream Interface System : Maintainer : MICHELE DAMOISEAU (michele.damoiseau@daphne-sa.be) Description : DAMERY Opal Downstream Interface HW v1.0 SW v2.5.2 Type : CATV Downstream Interface Max Speed : 42 Mbit/s | Cable modem System : Maintainer : MICHELE DAMOISEAU (michele.damoiseau@daphne-sa.be) Description : Cable modem | CATV Upstream Interface 3 System : Maintainer : MICHELE DAMOISEAU (michele.damoiseau@daphne-sa.be) Description : DAMERY Opal Upstream Interface HW v1.0 SW v2.5.2 Type : CATV Upstream Interface Max Speed : 5 Mbit/s |
|--|--|--|
| <p>The statistics were last updated Friday, 4 November 2011 at 11:41.</p> <p>Daily' Graph (5 Minute Average)</p>  <p>Max In: 0.0 kbps (0.0%) Average In: 0.0 kbps (0.0%) Current In: 0.0 kbps (0.0%) Max Out: 32.0 Mbit/s (74.7%) Average Out: 16.3 Mbit/s (38.1%) Current Out: 6780.3 kbit/s (15.8%)</p> <p>Weekly' Graph (30 Minute Average)</p>  <p>Max In: 0.0 kbps (0.0%) Average In: 0.0 kbps (0.0%) Current In: 0.0 kbps (0.0%) Max Out: 34.6 Mbit/s (80.7%) Average Out: 18.0 Mbit/s (42.1%) Current Out: 5627.0 kbit/s (22.4%)</p> <p>Monthly' Graph (2 Hour Average)</p>  <p>Max In: 0.0 kbps (0.0%) Average In: 0.0 kbps (0.0%) Current In: 0.0 kbps (0.0%) Max Out: 31.7 Mbit/s (73.8%) Average Out: 17.3 Mbit/s (40.5%) Current Out: 13.9 Mbit/s (32.4%)</p> | <p>The statistics were last updated Friday, 4 November 2011 at 13:21.</p> <p>Daily' Graph (5 Minute Average)</p>  <p>Max In: 441.0 Modems Average In: 438.0 Modems Current In: 441.0 Modems Max Out: 450.0 Modems Average Out: 443.0 Modems Current Out: 442.0 Modems</p> <p>Weekly' Graph (30 Minute Average)</p>  <p>Max In: 449.0 Modems Average In: 438.0 Modems Current In: 439.0 Modems Max Out: 453.0 Modems Average Out: 445.0 Modems Current Out: 440.0 Modems</p> <p>Monthly' Graph (2 Hour Average)</p>  <p>Max In: 449.0 Modems Average In: 432.0 Modems Current In: 439.0 Modems Max Out: 453.0 Modems Average Out: 439.0 Modems Current Out: 443.0 Modems</p> | <p>The statistics were last updated Friday, 4 November 2011 at 13:26, at which time 'jade.daphne-sa.be' had been up for 203974099.</p> <p>Daily' Graph (5 Minute Average)</p>  <p>Max In: 1910.9 kbit/s (37.3%) Average In: 938.9 kbit/s (18.3%) Current In: 1095.4 kbit/s (21.4%) Max Out: 0.0 kbit/s (0.0%) Average Out: 0.0 kbit/s (0.0%) Current Out: 0.0 kbit/s (0.0%)</p> <p>Weekly' Graph (30 Minute Average)</p>  <p>Max In: 2023.2 kbit/s (39.5%) Average In: 1017.6 kbit/s (19.9%) Current In: 947.5 kbit/s (18.5%) Max Out: 0.0 kbit/s (0.0%) Average Out: 0.0 kbit/s (0.0%) Current Out: 0.0 kbit/s (0.0%)</p> <p>Monthly' Graph (2 Hour Average)</p>  <p>Max In: 1915.6 kbit/s (37.4%) Average In: 1043.4 kbit/s (20.4%) Current In: 806.7 kbit/s (15.8%) Max Out: 0.0 kbit/s (0.0%) Average Out: 0.0 kbit/s (0.0%) Current Out: 0.0 kbit/s (0.0%)</p> |

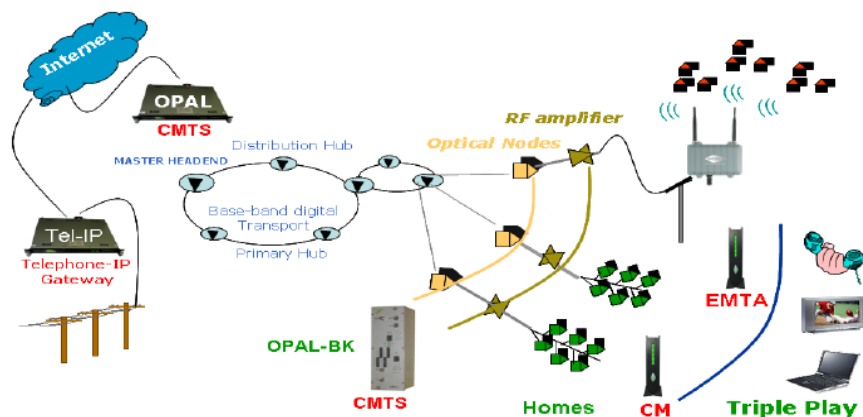
Specifications : OPAL-T /OPAL-TS CMTS

| RF Specification | Network and Security | Environmental |
|---|--|---|
| <p>Downstream</p> <ul style="list-style-type: none"> ➤ Bandwidth by channel: 6 MHz or 8 MHz ➤ Modulation: 64QAM, 256QAM ➤ Symbol rate: 0.88 to 6.9 MSymb/s ➤ Frequency Range: 88 MHz to 860 MHz (Optional extended range to 1000 MHz) ➤ Spectral Occupancy: 64 QAM: 0.18 SRRC, 256 QAM: 0.12 SRRC ➤ Return Loss: 14 dB ➤ Output Impedance: 75 ohms <p>Upstream</p> <ul style="list-style-type: none"> ➤ Modulation: QPSK, 8,16,32,64 QAM ➤ Error Correction: Reed Solomon ➤ Frequency Range: 5 MHz to 65 MHz agile, in 100 Hz steps ➤ Symbol Rate: 160, 320, 640, 1280, 2560, 5120 ksym/s ➤ Input Levels: -16dBmV to +26 dBmV | <p>Network Management</p> <ul style="list-style-type: none"> ➤ SNMP ➤ MIB Group: MIB II, DOCSIS MIB, Vendor-Specific MIB ➤ DHCP Relay ➤ Option 82 ➤ IP Helpers ➤ PPPoE ➤ Telnet <p>Network Interfaces</p> <ul style="list-style-type: none"> ➤ Ethernet standard (IEEE 802.3) ➤ Ethernet interface: RJ 45 connector for 1000BaseT <p>Media-Access-Control (MAC)</p> <p>DOCSIS 2.0, DOCSIS 1.1, DOCSIS 1.0</p> <p>IP Process</p> <ul style="list-style-type: none"> ➤ IGMP snooping ➤ VPN transparent | <p>Environmental parameters</p> <ul style="list-style-type: none"> ➤ Operating temperature 0°C ~ 40°C ➤ Storage temperature -10°C ~ 60°C <p>Power Supply</p> <ul style="list-style-type: none"> ➤ 220V/110V ➤ Maximum power 65W <p>On board ProMo OSS</p> <p>Available on board on all type of CMTS up to 500 users</p> <ul style="list-style-type: none"> ➤ Web access ➤ User Admission ➤ Configuration file building ➤ Support - Provisioned Registration ➤ DHCP/TOD/TFTP/HTTP services ➤ Subscriber and modem data base management ➤ Billing option: Prepaid, post-paid traffic limited ➤ Monitoring, SNR graphs ➤ CM/CPE IP History ➤ CMTS configuration |

Draft Specifications OPAL/BK CMTS

| RF Specification | Network and Security | Environnemental |
|---|--|---|
| <p>Downstream</p> <ul style="list-style-type: none"> ➤ Bandwidth: 6 MHz or 8 MHz ➤ Modulation: 64QAM, 256QAM ➤ Symbol rate: 0.88 to 6.9 MSymb/s ➤ Frequency Range: 88 MHz to 860 MHz (Optional extended range up to 1000MHz) ➤ Spectral Occupancy: 64 QAM: 0.18 SRRC 256 QAM: 0.12 SRRC ➤ Return Loss: 14 dB ➤ Output Impedance: 75 ohms <p>Upstream</p> <ul style="list-style-type: none"> ➤ Modulation: QPSK, 8,16,32,64 QAM ➤ Error Correction: Reed Solomon ➤ Frequency Range: 5 MHz to 65 MHz agile, in 100 Hz steps ➤ Symbol Rate: 160, 320, 640, 1280, 2560, 5120 ksym/s ➤ Input Levels: -16dBmV to +26 dBmV | <p>Network Management</p> <ul style="list-style-type: none"> ➤ SNMP ➤ MIB Group: MIB II, DOCSIS MIB, Vendor-Specific MIB ➤ DHCP Relay ➤ Option 82 ➤ IP Helpers ➤ PPPoE ➤ Telnet <p>Media-Access-Control (MAC)</p> <p>DOCSIS 2.0, DOCSIS 1.1, DOCSIS 1.0</p> <p>IP Process</p> <ul style="list-style-type: none"> ➤ IGMP snooping ➤ VPN transparent <p>Security</p> <ul style="list-style-type: none"> ➤ DOCSIS Baseline Privacy (BPI) ➤ Software upgradeable to BPI+ | <p>Environmental parameters</p> <ul style="list-style-type: none"> ➤ Operating temperature 0°C ~ 40°C ➤ Storage temperature -25°C ~ 60°C ➤ Humidity 10 % ~ 90 % (non-condensing) <p>Power Supply</p> <ul style="list-style-type: none"> ➤ +22,8V Min, + 24V Nom, +25,2V Max ➤ 18W Min, 20W Nom, 22W Max <p>Network Interfaces</p> <ul style="list-style-type: none"> ➤ Ethernet standard (IEEE 802.3) ➤ Ethernet interface: <ul style="list-style-type: none"> ○ 1 x 100BaseT management ○ 1 x 1000BaseT / Base X Port-Packet ➤ Types of interfaces: <ul style="list-style-type: none"> ○ special connectors for 100BaseT ○ RJ 45 connector for 1000BaseT ○ optical interface for 1000BaseX type of optical connector as required |

Damery is offering global solution for Cable Internet and VOIP services



Sales and Service points

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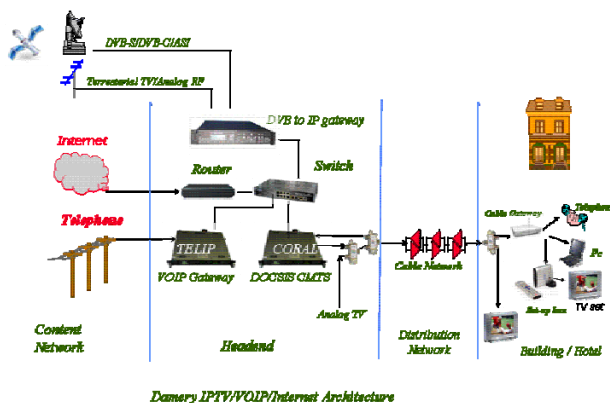
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NV DAMERY SA
Head office : Rue d'Aulne, 20
6110 Montigny-le-Tilleul (Belgium)
Company n° 0811.007.201
www.damery.be

Specifications: CORAL-TINY CMTS

| RF Specification | Network and Security | Environmental |
|--|---|--|
| <p>Downstream port: 1DS</p> <ul style="list-style-type: none"> ➤ Number of channels 16 ➤ QAM modulation : Annex A, B or C ➤ QAM constellations: 16QAM, 64QAM, 256QAM ➤ Data Rates <ul style="list-style-type: none"> ○ DOCSIS : 27 Mbps @ 64 QAM, 38 Mbps @ 256 QAM ○ EuroDOCSIS : 36 Mbps @ 64 QAM, 56 Mbps @ 256 QAM ➤ Frequency range (center) <ul style="list-style-type: none"> ○ 88 to 1002MHz) ➤ Channel width : 6 to 8 MHz ➤ Symbol rate: 0.88 to 6.9 MSymb/s ➤ Spectral Occupancy: <ul style="list-style-type: none"> ○ 64 QAM: 0.18 SRRC ○ 256 QAM: 0.12SRRC ➤ Return Loss: 14 Db ➤ Output Impedance: 75 ohms ➤ Connector F-type, 75 Ω <p>Upstream PORT : 1</p> <ul style="list-style-type: none"> ➤ Number of Channels : 4US/8US/16 ➤ Modulation: QPSK, 8, 16, 32, 64 QAM ➤ Error Correction: Reed Solomon ➤ Frequency Range: 5MHz to 65Mhz agile, in 100Hz steps ➤ Symbol Rate: 160, 320, 640, 1280, 2560, 5120 ksym/s ➤ Input Levels: -16dBmV to +26 dBmV | <p>Network Management</p> <ul style="list-style-type: none"> ➤ SNMP ➤ MIB Group: MIB II, DOCSIS MIB, Vendor-Specific MIB ➤ PPPoE ➤ Telnet <p>Media-Access-Control (MAC)</p> <ul style="list-style-type: none"> ➤ DOCSIS 2.0, DOCSIS 1.1, DOCSIS 1.0 ➤ DOCSIS 3.0 <ul style="list-style-type: none"> ○ downstream channel bonding up to 4 channels ○ upstream channel bonding (up to 4 channels) ➤ Firmware upgradeable to AES encryption and IPv6 for CM ➤ Load balancing ➤ Spectral Management <p>Network Interfaces</p> <ul style="list-style-type: none"> ➤ Ethernet standard (IEEE 802.3) ➤ Ethernet interface: RJ 45 connector for 1000BaseT <p>IP Process</p> <ul style="list-style-type: none"> ➤ IGMP snooping ➤ VPN transparent ➤ Dhcp Relay Option 82 ➤ QoS ➤ LI ➤ Bridge | <p>Environmental parameters</p> <ul style="list-style-type: none"> ➤ Operating temperature 0°C ~ 40°C ➤ Storage temperature -10°C ~ 60°C <p>Power Supply</p> <p>220V/110V Maximum power 65W</p> <p>On-board ProMo OSS</p> <p>Available on-board on all types of CMTS up to 500 users</p> <ul style="list-style-type: none"> ➤ Web access, ➤ User Admission ➤ Configuration file building ➤ Support - Provisioned Registration ➤ DHCP/TOD/TFTP/HTTP services ➤ Subscriber and modem data base management ➤ Billing option: Prepaid, postpaid traffic limited ➤ Monitoring, SNR graphs ➤ CMTS configuration |

Damery is offering global solution for Cable Internet and VOIP -TV Triple Play services for small networks



CORAL Tiny

opens the door to dependable high-speed services for small networks

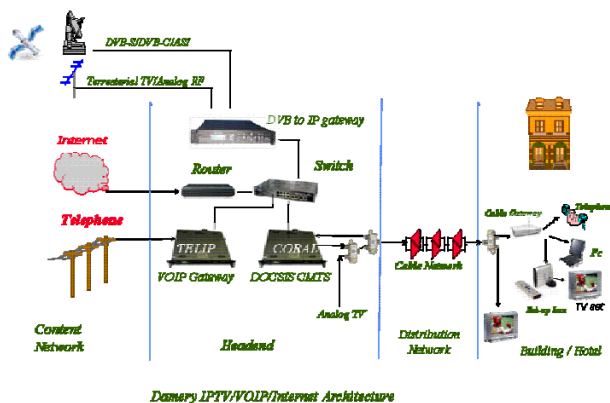
Sales and Service points

DAMERY SA , Chaussée de Binche 101D , 7000 Mons – BELGIUM

Specifications: CORAL-S-CMTS

| RF Specification | Network and Security | Environmental |
|---|---|--|
| <p><u>Downstream port: 1DS</u></p> <ul style="list-style-type: none"> ➤ Number of channels 4 ➤ QAM modulation : Annex A, B or C ➤ QAM constellations: 16QAM, 64QAM, 256QAM ➤ Data Rates <ul style="list-style-type: none"> ○ DOCSIS : 27 Mbps @ 64 QAM, 38 Mbps @ 256 QAM ○ EuroDOCSIS : 36 Mbps @ 64 QAM, 56 Mbps @ 256 QAM ➤ Frequency range (center) <ul style="list-style-type: none"> ○ 88 to 1002MHz ➤ Channel width : 6 to 8 MHz ➤ Symbol rate: 0.88 to 6.9 MSymb/s ➤ Spectral Occupancy: <ul style="list-style-type: none"> ○ 64 QAM: 0.18 SRRC ○ 256 QAM: 0.12SRRC ➤ Return Loss: 14 Db ➤ Output Impedance: 75 ohms ➤ Connector F-type, 75 Ω <p><u>Upstream PORT :2</u></p> <ul style="list-style-type: none"> ➤ Number of Channels : 4US/8US/16 ➤ Modulation: QPSK, 8, 16, 32, 64 QAM ➤ Error Correction: Reed Solomon ➤ Frequency Range: 5MHz to 65Mhz agile, in 100Hz steps ➤ Symbol Rate: 160, 320, 640, 1280, 2560, 5120 ksym/s ➤ Input Levels: -16dBmV to +26 dBmV | <p><u>Network Management</u></p> <ul style="list-style-type: none"> ➤ SNMP ➤ MIB Group: MIB II, DOCSIS MIB, Vendor-Specific MIB ➤ PPPoE ➤ Telnet <p><u>Media-Access-Control (MAC)</u></p> <ul style="list-style-type: none"> ➤ DOCSIS 2.0, DOCSIS 1.1, DOCSIS 1.0 ➤ DOCSIS 3.0 <ul style="list-style-type: none"> ○ downstream channel bonding up to 4 channels ○ upstream channel bonding (up to 4 channels) ➤ Firmware upgradeable to AES encryption and IPv6 for CM ➤ Load balancing ➤ Spectral Management <p><u>Network Interfaces</u></p> <ul style="list-style-type: none"> ➤ Ethernet standard (IEEE 802.3) ➤ Ethernet interface: RJ 45 connector for 1000BaseT <p><u>IP Process</u></p> <ul style="list-style-type: none"> ➤ IGMP snooping ➤ VPN transparent ➤ Dhcp Relay Option 82 ➤ QoS ➤ LI ➤ Bridge | <p><u>Environmental parameters</u></p> <ul style="list-style-type: none"> ➤ Operating temperature 0°C ~ 40°C ➤ Storage temperature -10°C ~ 60°C <p><u>Power Supply</u></p> <p>220V/110V Maximum power 65W</p> <p><u>Dimensions</u></p> <p>26.5 x 25 x 20 (cm x cm x cm)</p> <p><u>On-board ProMo OSS</u></p> <p>Available on-board on all types of CMTS up to 4000 users</p> <ul style="list-style-type: none"> ➤ Web access, ➤ User Admission ➤ Configuration file building ➤ Support - Provisioned Registration ➤ DHCP/TOD/TFTP/HTTP services ➤ Subscriber and modem data base management ➤ Billing option: Prepaid, postpaid traffic limited ➤ Monitoring, SNR graphs ➤ CMTS configuration |

Damery is offering global solution for Triple Play services: Internet-VOIP-IPTV



Great Performance!

Modular



CORAL-S

S as "Small, Simple, Super"

Sales and Service points

DAMERY SA , Chaussée de Binche 101D , 7000 Mons – BELGIUM