



MPEG over IP and Telco

Media Combiner 1900 series Network Adapter

DTT distribution / DTV transmission

Satellite backhaul

DAB distribution

DVB-ASI and E1/T1 over Ethernet/IP/MPLS, E3, DS3, E4, STM-1 and OC-3



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The ARG Media Combiner is used by many of the world's leading TV media distribution companies to transmit MPEG multi-programme transport streams to satellite uplink facilities, TV transmitter networks and cable TV head-ends. Proven reliability, ease of installation and transparency to any DVB-ASI signal contribute to its global reputation as a world-class, product of distinction.

Multiple ASI and E1 user ports make it ideal for Digital Terrestrial Television (DTT & DTV), including Single Frequency Networks and Digital Radio (DAB) distribution. Combinations of up to eight ASI, E1 or T1 user ports may be installed in each chassis.

The ARG Media Combiner has a full range of network interface options for dark fibre, legacy SDH/PDH and the latest Fast Ethernet / GigE MPLS IP networks. The network interface can be easily changed, for example a DS3 card can be swapped for Fast Ethernet/GigE. In this way, the Media Combiner evolves with network requirements as new services are introduced and utilised.

Dual power supplies and a large installed base contribute to a proven MTBF of over 30 years. The speed of installation and commissioning, requiring no special tools or a computer interface, minimises staff training and significantly reduces cost of ownership.

An intuitive front panel provides local set up and control. A webserver interface and SNMP capability provide remote management and linkage to third party network control systems. The Media Combiner integrates perfectly with the ARG FLEX 2400 protection switch to provide simple 1+1 and dual link configurations.

Choice of Network Interface

Today's networks are complex and evolve at different rates. The ARG Media Combiner can be used on a wide range of networks including

- E3 (34 Mbit/s) and DS3 (45 Mbit/s)
- E4 (140 Mbit/s)
- SDH STM-1 and SONET OC-3 (155 Mbit/s)
- 100 BaseT and Gigabit Ethernet.

Interface adapters may be retrofitted on the Media Combiner as your network evolves.

Gigabit Ethernet Network Interface

Featuring all the necessary standards, such as SMPTE-2022/COP#3, FEC, the GigE Network Interface in the Media Combiner brings with it the peace of mind and ease of use unavailable in other equipment. Configuration using a PC or laptop is not required.

34Mbit/s and 45Mbit/s E3/DS3 Network Interface

The latest 34/45 Mbit/s E3/DS3 Network Interface operates over framed and un-framed services and may be changed between E3 and DS3 operation from the front panel. This makes for rapid deployment by operators who use both types of circuits. Each E3/DS3 module has a dual output making redundant transmission configuration possible.

STM-1 155Mbit/s Network Interface

The STM-1 155Mbit/s Interface is available with electrical G.703 connector or Optical OC-3 with a 1300nm, -11dBm laser and with a receiver sensitivity of -31dBm.. The maximum data rate within and STM-1 frame for a 192 byte ASI frame is 140.4 Mbit/s and for a 204 byte frame is 132.14 Mbit/s. This is far greater than using AAL1 or AAL5 ATM systems and avoids the associated jitter that ATM introduces.

Two levels of Forward Error Correction (FEC).

Two levels of Reed Solomon Forward (FEC) are selectable, 4 byte or 16 bytes. In addition, the Gigabit Ethernet Network Interface features SMPTE-2022 / COP#3, FEC on top of the Reed Solomon.

Jitter handling

ARG clock recovery and jitter handling circuitry is second to none and is completely transparent to the ASI or E1/T1 data being carried. Delay through the Media Combiner is minimal.



Transparent ASI Transport Streams

The Media Combiner adds less than 1 ms of delay for a 15Mbit/s transport stream on SDH and PDH Network Interfaces. Clock recovery does not use Transport Stream data, leaving all MPEG PIDs unchanged.

Bandwidth management

Bandwidth may be rate limited for ASI and SPI channels at the transmitting Media Combiner. This feature is useful when carrying third part traffic to ensure bandwidth is used fairly between customers.

Up to 8 Access Interfaces ASI, E1,T1 or SPI

Up to four Dual Channel Access Modules of ASI, E1, T1 or SPI can be installed in any combination in the Media Combiner. Using this feature for example, DVB-T ASI Transport Streams can be distributed alongside E1 DAB multiplex data to the same transmitter sites.

ASI Transport Access Modules

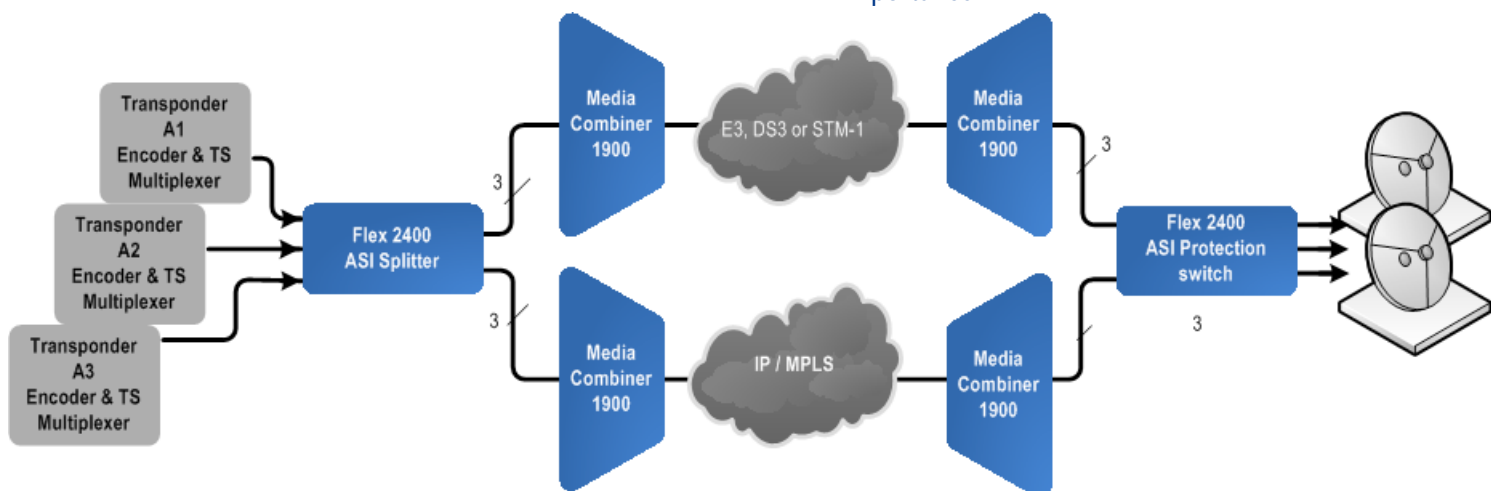
The ASI Transport Access Module takes one or two channels of ASI data in or out of a Media Combiner. If a single input channel is used then the ASI transport stream appears on both outputs of the paired receiving Media Combiners. This function can reduce the need for distribution amplifiers at receive sites.

E1/T1 2 Mbit/s & 1.5Mbit/s Data Access Modules

The E1/T1 Data Access modules can be used for analogue audio broadcasts with an appropriate encoder/decoder or for DAB distribution over E1. Together with the Gigabit Ethernet module, the Media Combiner can provide a platform for DAB distribution over IP/MPLS networks.

Protection Switching Integration

The ARG FLEX - ASI and Telco Protection Switch and Splitter can be used in many ways with the Media Combiner to configure redundant encoder and link configurations, ensuring an even higher level of reliability, as shown in the illustration below.



Front panel control

Media Combiners can be setup from the front panel with a password to lock settings. This is especially useful in large networks or at remote sites when rapid, accurate commissioning is important.

Fast & easy configuration

A receiving Media Combiner automatically configures itself to a transmitting Media Combiner, only the IP address needs to be set on a receiver unit which can be done via the front panel. The surety and speed of installation that this provides saves greatly on cost of ownership.

Web Management and SNMP

A built in web server interface and SNMP MIB ensure that the Media Combiner can fit into any current or future Network Management System (NMS). Rear panel contact closure alarms are provided for interface to third party NMS and monitoring equipment such as the ARG REMON

High Reliability

A recorded Mean Time Between Failure (MTBF) in excess of 30 years proves that the Media Combiner is probably one of the most reliable network adapters available. All ARG products feature dual power supplies as standard and we also offer a -48 VDC option on all products.

Proven on SFN networks

The SDH and PDH versions of the Media Combiner are being deployed across a major European DTT SFN network. The low delay and jitter free performance being of utmost importance.

Network Interface Options - Interchangeable module

| IP | GigE 1000Mb/s |
|------------------|---|
| Connector | 10/100/1000 Base-T Ethernet RJ45 |
| Protocols | IEEE802.3 Ethernet, IPv4, IPv6 ready, ARP, ICMP, IGMPv2, RTP, UDP |
| MTU size | 1500 bytes |
| Error Correction | Pro-MPEG COP#3 FEC |
| Max Data rate | 213.7 Mb/s total ASI |

| SDH / PDH | E3 34Mb/s | DS3 Framed 45 Mb/s | DS3 Unframed 45 Mb/s | E4 140 Mb/s | STM-1/OC3 Framed 155 Mb/s |
|------------------------------|--------------|--------------------------|----------------------------|----------------|---------------------------------|
| Line Code | HDB-3 | B3ZS | B3ZS | CMI | CMI |
| Line Rate | 34.368 Mb/s | 44.736 Mb/s | 44.736 Mb/s | 139.264 Mb/s | 155.52 Mb/s |
| Max Data Rate 192 byte frame | 31.962 Mb/s | 41.115 Mb/s | 41.604 Mb/s | 129.608 Mb/s | 140.40 Mb/s |
| Max Data rate 204 byte frame | 30.24 Mb/s | 38.904 Mb/s | 39.368 Mb/s | 122.64 Mb/s | 132.14 Mb/s |

| Optical | Dark Fibre |
|---------------------------------|--------------------|
| Connector type | FC receptacle |
| Output power | -11dBm |
| Minimum Input Sensitivity Level | -31dBm |
| Maximum Input Sensitivity Level | -7dBm |
| Optical Cable | Single-mode 1310nm |

Access Interface Options - Interchangeable modules 4 slots

| Module Type | Dual ASI | Single ASI | Dual E1 2Mbit/s G.703 | Dual T1 1.544 Mbit/s G.703 | LVDS |
|---------------|------------------------|------------|--------------------------|-------------------------------|---------------|
| Line Code | 8B10T | 8B10T | HDB-3 | B3ZS | N/A |
| Connector | BNC | BNC | BNC | BNC | 26 way D type |
| Max data rate | 135 Mbit/s per channel | 135 Mbit/s | 2 x 2048 Kbit/s. | 2 x 1554 Kbit/s | 2 x 20 Mbit/s |

General Specification

| Management and control | System Error correction |
|---|---|
| Front Panel Interface with password lock | Reed-Solomon FEC, selectable 4 byte or 16 byte - all interfaces |
| SNMP & Web interface | Covolutional Interleaving - all interfaces |
| GPI provided via connectors on the rear panel | SMPTE 2022 COP#3 - Gigabit Ethernet |

| Power Supply |
|--|
| Dual supply, single phase auto-ranging, 100-240VAC (50-60Hz), 36-72 V DC (factory fitted option) |
| Power consumption 30W max. (Depending upon modules fitted. Please consult with factory) |

| Weight and Dimensions |
|---|
| Height 1RU 43.6mm (1U) x Width 482.6mm (19") x Depth 383mm (15") incl. connectors |



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