



# Synapse

## MGU200

## MGG200

**SDI multiview building block with 8 inputs and up to 8 outputs (heads) or dual 4k/UHD output resolution**

A Synapse® product



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## Introduction

This module is building block for the Synapse modular multi-viewer. This Multiview system consists of 4 different modules which can be mixed and matched to build a multiviewer with up to hundreds of inputs and 8 1080p heads or two 4K/UHD heads.

There are currently 4 models defined below their differences:

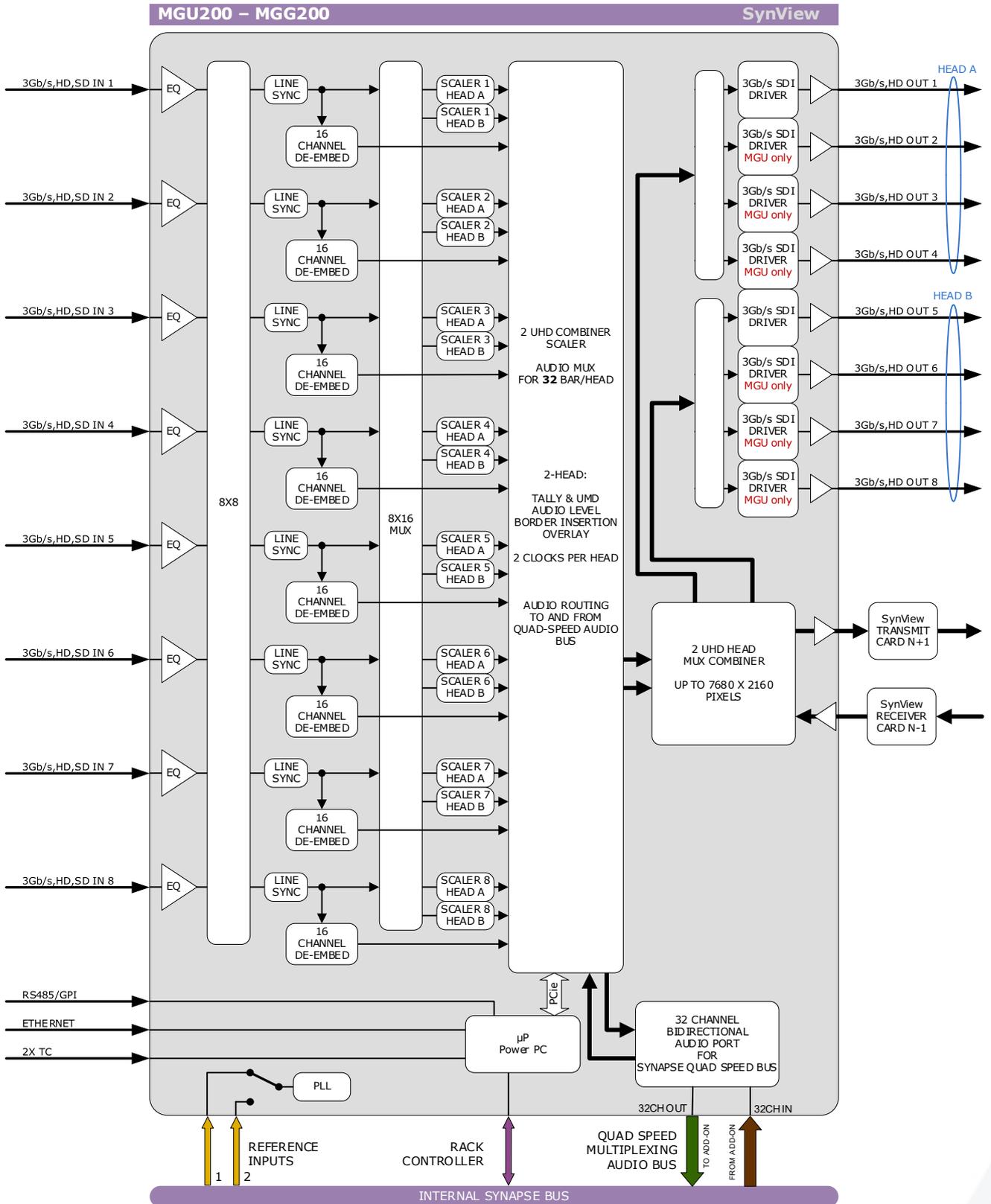
differentiation Model name Application	SDI IN	SDI OUT	PIP	monitoring
MGU200 Production SDI inputs	8	8	16	basic
MGG200 Production SDI inputs	8	2	16	basic
MGU100 Monitoring SDI inputs	8	8	8	extensive
MGG100 Monitoring SDI inputs	8	2	8	extensive

The above cards have the same output configuration with up to dual head UHD/4k or dual quad 3Gb/s SDI, or 8 heads on SDI. The cards can be combined in any combination up to **12** cards in the new SFR18 gen3 with the new SMP175 power supply. In the Gen3 SFR08 will fit up to 5 boards.

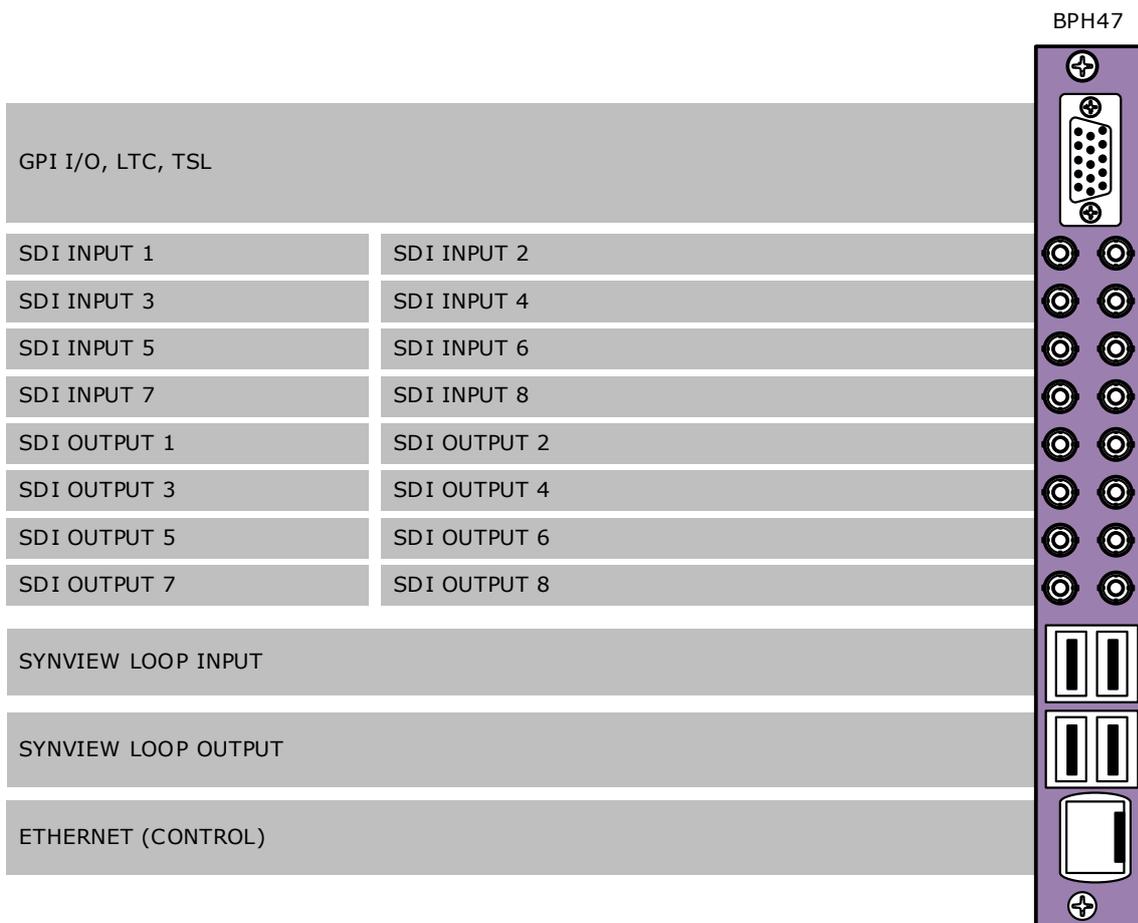
Because of the external Daisy Chain mini SAS-HD connector you can build a multi viewer with, in theory, an unlimited amount of input channels as you can chain the cards even between frames. You can split the multiviewer into smaller chunks of cards, each block with its own set of PIPs (Picture In Pictures) and its own outputs. A MGU/MGG100 can also be used stand alone as a dual quad split.



Block schematic MGU200 & MGG200



## Connector panel option



## HDMI connectivity

The consumer display market supplies our industry with great monitor options at very reasonable prices. The UHD compatibility of the Synapse multiviewer allows for the use of very cost effective 4K/UHD screens. The inputs for these screens are always based on HDMI. Recently the standard has been improved and the 2.0 spec allows for 4K with up to 60p frame rates.

A four-wire to HDMI 2.0 converter ideally compatible with 2SI (or two sample interleaved) or Quadrants is needed to connect the SDI outputs to these commercial screens.

## Features

Because of the external Daisy Chain mini SAS-HD connector you can build a multi viewer with, in theory, an unlimited amount of input channels as you can chain the cards even between frames. You can split the multiviewer into smaller chunks of cards, each block with its own set of PIPs (Picture In Pictures) and its own outputs. A MGU200 can also be used stand alone as a dual quad split (or even oct split) with 8 1080p pictures spread over 2 UHD screens (pixel mapping with no scaling).

The MGU200 and MGG200 are 8 SDI input multiview building blocks with up to 8 outputs. These outputs can be grouped to 2x 4-wire UHD/4K outputs on the MGU200. Features MGU200/MGG200:

- 8 inputs to two individual panel outputs or 8 SDI outputs (MGU100) or 2 SDI (up to 1080p) outputs (MGG100)
- Each input can be displayed on one head with an individual scale and position
- Low latency (20 ms for 50Hz, 17 ms for 59.94Hz)
- Full RGB domain (internal 20bit processing for scaling)
- Up to 2x 4k/UHD (2160p60) resolution on 2x 4-wire SDI (MGU100 only)
- Up to 8 3Gb/s SDI outputs
- Full variable scaling and positioning for all individual inputs
- All inputs are compatible with 1080p50/59.94, 1080p(sf)29.97/25/24, 1080i50/59.94, 720p59.94/50/29.97/25/24 and SD625/525 (mixing is allowed with different frame rates)
- 32 audio bars (per head) free assignable from 128 embedded sources and/or 32 sources via the Quad Speed Audio bus
- Three assignable regions in or under monitor: Input format, Static UMD and Dynamic UMD, VITC, ATC, LTC, Aspect Ratio
- Lock to input, reference, or leave free running
- Masked or transparent audio bar graphics with AES/EBU, BBC or Nordic scale VU meters.
- Customizable color schemes for audio meters
- Two definable clocks per head; Analog, Digital or Combined
- Digital clock can be set to normal time, up counter or down counter
- Clocks can be assigned to VITC, ATC, LTC, NTP (Ethernet) or system
- UMD colors: gray, green, red and amber
- Border, UMD and tally brightness adjustments
- Automatic 4:3 and 16:9 modes through VI or WSS triggers (SD-SDI inputs)
- GPI control for Aspect ratio, Full screen modes and Tally
- Locks to Bi-level, Tri-level syncs or SDI input
- Full control and status monitoring through the front panel of the SFR08/SFR18 frame and the Ethernet port (ACP)

## Why a Synapse modular multiviewer

There are some unique features that will make this system stand out over the competition:

- Ultra-fast boot time
- The only single field latency (20ms@50Hz and 16,7ms@59.94Hz) multiview system
- Linear expandable system in steps of 8 input channels
- Multi-card multiview systems can span multiple frames by use mini-SAS-HD cables
- Unlimited number of inputs per dual UHD output configuration
- Unlimited number of inputs per 8 FHD SDI output configuration
- Linear increase of cost, no penalty for a small system
- Linear increase of horsepower
  - The card has enough processing power to scale, position, de-embed, overlay and process 8 video channels. When you double the number of inputs you double the amount of processing power
  - A 128-channel system has 16 times the processing power of an 8 channel system
- can be combined with over 300 different processing modules in the same frame

## Applications

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- Small to extremely large monitoring walls
- Fast response production monitor walls with unequalled low processing delay and startup time
- High resolution high source count monitor walls
- OB van preview monitoring and shading

## Ordering information

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**Module:**

- **MGU200:** 8 x SDI input with 16 PIPs and dual UHD head
- **MGG200:** 8 x SDI input with 16 PIPs and dual HD head

**Standard I/O:**

- **BPH47\_MGXxxx:** Connector panel for SDI inputs

## Specifications

### Serial Video Input

<b>Standard</b>	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio  SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M, SMPTE424  1080i/59.94, 1080i/50, 720p/59.94, 720p/50 1080p/50 and 1080p/59.94
<b>Equalization</b>	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable. Automatic to 80m @ 3Gb/s with Belden 1694A or equivalent cable.
<b>Return Loss</b>	> 15dB up to 1.5GHz
<b>Number of Inputs</b>	8

### Reference Input through RRC

<b>Number of Inputs</b>	2 on SFR18, 2 on SFR08
<b>Tri-level</b>	SMPTE274M, SMPTE296M 600 mVp-p nominal, 75 Ohms terminated through loop
<b>Bi-level</b>	PAL Black Burst ITU624-4/SMPTE318, Composite NTSC SMPTE 170M 1Vp-p nominal, 75 Ohms terminated through loop

### Display output

<b>Standard</b>	RJ45 containing DVI or HDMI up to UHD/60p
<b>Number of Outputs</b>	2 display signals Up to 8 3Gb/s SDI
<b>Cable driver</b>	Up to 10 meter with CAT6 Up to 100 meter on SDI

### Serial video output

<b>Standard</b>	SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M, SMPTE424A
<b>Number of Outputs</b>	8

### LTC Input

<b>Standard</b>	SMPTE 12M
<b>Connector</b>	15pins D-sub
<b>Number of Inputs</b>	2

### Miscellaneous

<b>Weight</b>	Approx. 350g
<b>Operating Temperature</b>	0 °C to +50 °C
<b>Dimensions</b>	137 x 296 x 20 mm (HxWxD)

### Electrical

<b>Voltage</b>	+24V to +30V
<b>Power</b>	<35 Watts