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Flashlink User Manual

DAC-PAL-M

SDI Distribution Amplifier with Composite Analogue Monitoring Output

Rev. 2

network-electronics.com

Revision history

The latest version is always available in pdf-format on our web-site:

http://www.network-electronics.com/

Current revision of this document is the uppermost in the table below.

Revision	**Replaces**	**Date**	Change Description
2	1	2007-10-25	New front page and removed old logo.
1	0	2007-10-09	Added Materials Declaration and EFUP
0		17.11.05	First release

Index

1. General

The **flashlink**® DAC-PAL-M is a high-quality SD distribution amplifier with 3 x SD digital and 3 x composite analogue outputs. The SDI outputs are compliant to SMPTE 259M, and the composite analogue outputs are PAL / PAL-M compatible.

DAC-PAL-M user monitoring can be performed via the GYDA control interface.

The DAC-PAL-M is designed for all distribution and monitoring purposes in studio, duplication and Broadcast applications.

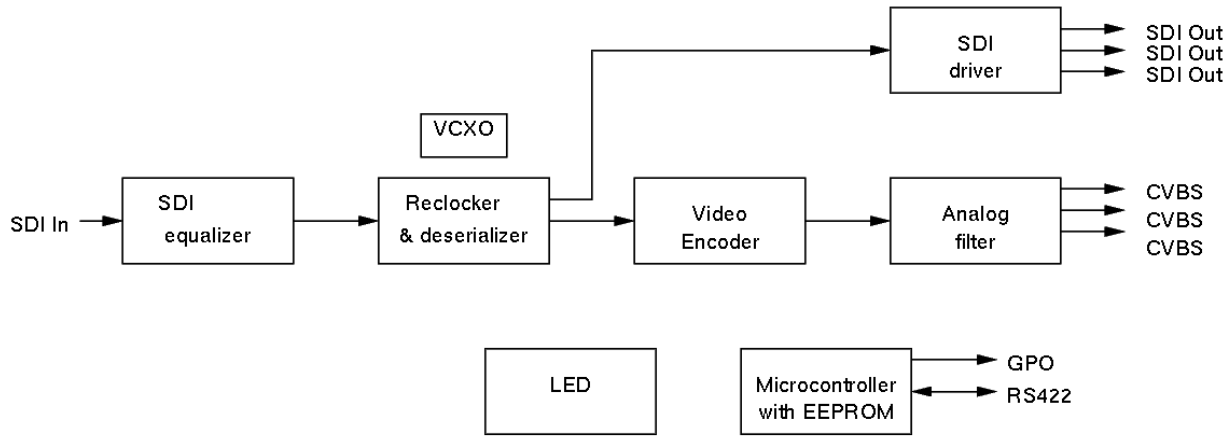


Figure 1 – Simplified block diagram of the DAC-PAL-M card

2. Specifications

Digital Serial Input

Signal:	4:2:2 SMPTE 259M-C, 270Mbps
Equalisation:	Automatic
Impedance:	75 ohm
Return loss:	>15dB @ 270MHz
Signal level:	nom. 800mV
Connector:	BNC

Digital Serial Output

Signal:	4:2:2 SMPTE 259M-C, 270Mbps reclocked
Connector:	BNC
Number of outputs:	3
Impedance:	75 ohm
Return loss:	>15dB @ 270MHz
Jitter:	max 0.2UI
Peak to peak signal level:	0.8V ± 0.1V

Analogue Output

Connector:	BNC
Impedance:	75 ohm
Formats:	Composite video, PAL 625/50 or PAL-M 525/60
Signal level:	1Vp-p
Return loss:	>40dB up to 10MHz

Processing Performance:

Signal path:	10 bits
Sampling:	27MHz
Video bandwidth:	5.5MHz
SNR:	>60dB typical

Power:	+5V DC / 2W
	-15V DC / 0.6W

3. Connector module

The DAC-PAL-M has a dedicated connector module: DAC-MON-C1. This module is mounted at the rear of the sub-rack. The module is shown in Figure 2 .

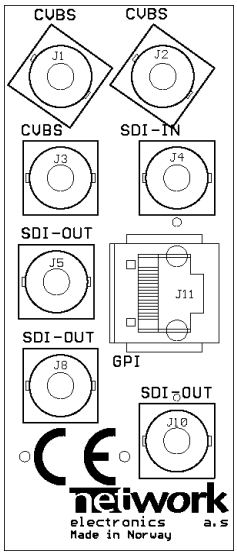


Figure 2 - DAC-MON-C1 connector module.

3.1 Correspondence of connectors and signals

The DAC-MON-C1 connector module has 7 BNC's:

CVBS	Analogue output. CVBS.
CVBS	Analogue output. CVBS.
CVBS	Analogue output. CVBS.
SDI-IN	Digital SDI input
SDI-OUT	Digital SDI output
SDI-OUT	Digital SDI output
SDI-OUT	Digital SDI output

3.2 Mounting the connector module

The details of how the connector module is mounted, is found in the user manual for the sub-rack frame FR-2RU-10-2.

This manual is also available from our web site: http://www.network-electronics.com/

4. Configuration and Setup

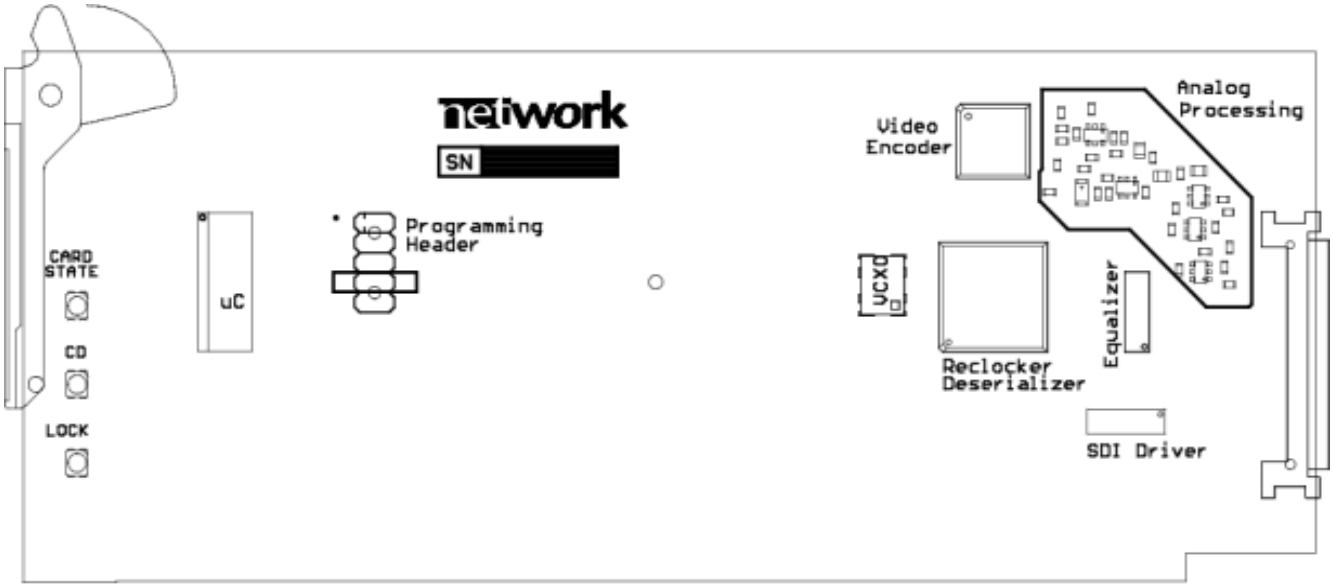


Figure 3 - DAC-PAL-M simplified silkscreen.

The DAC-PAL-M card has no direct user settings available with DIP switches. Refer to the GYDA Interface for possible user settings with the card.

5. Module status

The status of the module can be monitored in two ways.

1. GYDA System Controller (optional).
2. LED's at the front of the sub-rack.

The LED's are mounted on the module itself, whereas the GYDA System Controller is a separate module which gives detailed information on the card status. The functions of the LED's are described on the next page. The GYDA controller is described in a separate user manual. This manual is available on our web site: http://www.network-electronics.com/

5.1 GPI ALARM – Module Status Outputs

These outputs can be used for wiring up alarms for third party control systems. The GPI outputs are open collector outputs, sinking to ground when an alarm is triggered. The GPI connector is shown in Figure 4 .

Electrical Maximums for GPI outputs
Max current: 100mA
Max voltage: 30V

DAC-PAL-M module GPI pinning:

Signal	Name	Pin #	Mode
Status	General error status for the module.	Pin 1	Open Collector
CD	No video input detected	Pin 2	Open Collector
LOCK	Module not gen-locked to video input	Pin 3	Open Collector
Ground	0 volt pin	Pin 8	0V.

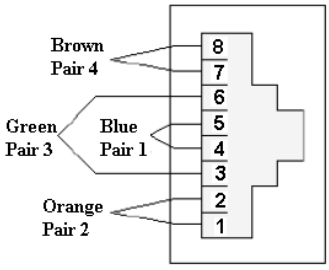
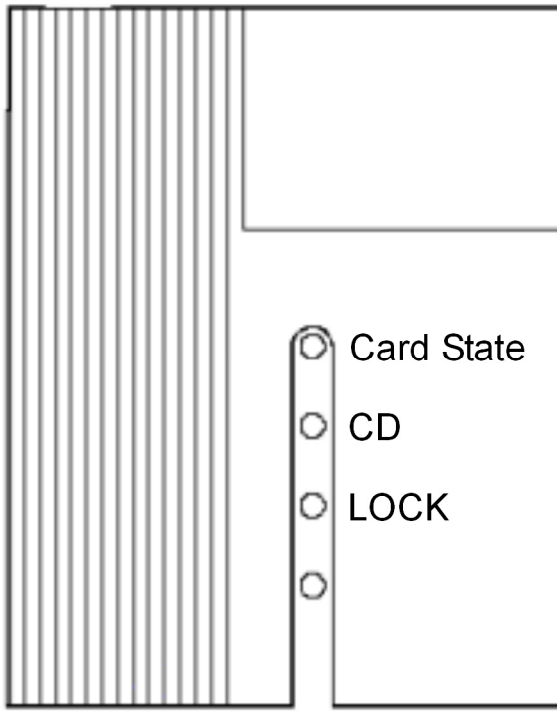


Figure 4 - GPI Outlet

5.2 Front Panel - Status Monitoring

The status of the module can be easily monitored visually by the LED's at the front of the module. The LED's are visible through the front panel as shown in Figure 5 below.



(Text not printed on the front panel).

Figure 5 - Front panel indicator for DAC-PAL-M

The DAC-PAL-M has 3 LED's each showing status information. The position of the different LED's is shown in Figure 5 .

Diode \ state	**Red LED**	**Yellow LED**	**Green LED**	**No light**
Card State	Module is faulty		Module is OK Module power is OK	Module has no power or memory fault
CD	No SDI video input (no Carrier Detect)		SDI video input is OK (Carrier Detected)	
Lock	Reclocker not in Lock	Reserved	Reclocker is Locked to SDI input.	

Table 1 - Front panel LED indicator overview

6. Interface with GYDA and RS-422 command set

All commands follow the flashlink protocol and can be used for direct control access to the module. The control system can either be a GYDA or a third-party control system with integrated flashlink protocol. The module can also be manually controlled with a VT100 compatible terminal program.

The protocol can be found on our web page; http://www.network-electronics.com

6.1 DAC-PAL-M Command table

Command	Response	Comment
?	Yes	The "Hello" command.
info	Yes	Gives back the card state.
Pedestal on	"OK"	Pedestal is present.
Pedestal off	"OK"	Pedestal is not present.
eget [0xHH]	Yes	Get a value from a numbered eeprom register.
eset [0xHH] [0xHH]	"OK"	Set a value to a numbered eeprom register.
get [0xHH]	Yes	Get a value from a numbered register.
set [0xHH] [0xHH]	"OK"	Set a value to a numbered register.

Table 2 - All commands available to the user

6.2 The "?" command

According to the Flashlink-protocol, no card can use the RS422-bus before it has been activated with the "?" (hello) command. The response from DAC-PAL-M will be:
xxxxDAC-PAL-M
PIC sw rev X.X.X
Protocol ver X.X

Here xxxx denotes the source and destination rack and slot coordinates, while **X** represents a version number. As of primo November 2004, these revisions would be:
xxxxDAC-PAL-M
PIC sw rev 1.0.0
Protocol ver 1.0

6.3 The "info" command

This command report the entire state of the card. An example:
xxxxLocked 50Hz
Pedestal on

Status of	Status string	Comment
Digital input.	Locked 50Hz	Locked to 625 lines 50 Hz.

	Locked 60Hz	Locked to 525 lines 60 Hz.
	Not locked	Not locked, output muted
Pedestal	Pedestal on	Pedestal is present when locked to 525.
	Pedestal off	Pedestal is not present when locked to 525.

Table 3: The info command broken up in components.

The "info" command is composed by many minor lines, fully specified in *Table 3*. In general, when a condition is normal, it is not reported. For instance, pedestal is reported when locked to 50Hz, even tough the setting has no effect on the video.

6.4 Pedestal command.

Command to turn on/off the Pedestal is straightforward text, see *Table 2* .

6.5 get, set, eget and eset.

These commands are for internal factory use. The end-user should avoid these commands.

Declaration of conformity with CE

This apparatus meets the requirements of EN 55103-1 (November 1996) with regard to emissions, and EN 55103-2 (November 1996) with regard to immunity; it thereby complies with the Electromagnetic Compatibility Directive 89/336/EEC.

General environmental requirements for Network flashlink® equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:

- Operating room temperature range 0°C to 40°C
- Operating relative humidity range up to 90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:

- Temperature range -10°C to 50°C
- Relative humidity range up to 95% (non-condensing)

3. Electromagnetic compatibility conditions:

- Emissions EN 55103-1 (Directive 89/336/EEC)
- Immunity EN 55103-2 (Directive 89/336/EEC)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Network Electronics ASA. These conditions are available on the company web site of Network Electronics ASA:

www.network-electronics.com

Materials declaration and recycling information

Materials declaration

For product sold into China after 1st March 2007, we comply with the "Administrative Measure on the Control of Pollution by Electronic Information Products". In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

組成名稱 Part Name	Toxic or hazardous substances and elements					
	鉛 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
DAC-PAL-M	X	O	O	O	O	O
O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006. X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.						

Environmentally-friendly use period

The manual must include a statement of the "environmentally friendly use period". This is defined as the period of normal use before any hazardous material is released to the environment. The guidance on how the EFUP is to be calculated is not finalised at the time of writing. See http://www.aeanet.org/GovernmentAffairs/qfLeOpAaZXaMxqGjSFbEidSdPNtpT.pdf for an unofficial translation of the draft guidance. For our own products, Network Electronics has chosen to use the *50 year figure* recommended in this draft regulation.

Network Electronics suggests the following statement on An "Environmentally Friendly Use Period" (EFUP) setting out normal use:

> **EFUP is the time the product can be used in normal service life without leaking the hazardous materials. We expect the normal use environment to be in an equipment room at controlled temperature range (0ºC - 40ºC) with moderate humidity (< 90%, non-condensing) and clean air, not subject to vibration or shock.**

Further, a statement on any hazardous material content, for instance, for a product that uses some tin/lead solders:

> **Where a product contains potentially hazardous materials, this is indicated on the product by the appropriate symbol containing the EFUP. The hazardous material content is limited to lead (Pb) in some solders. This is extremely stable in normal use and the EFUP is taken as 50 years, by comparison with the EFUP given for Digital Exchange/Switching Platform in equipment in Appendix A of "General Rule of Environment-Friendly Use Period of Electronic Information Products". This is indicated by the product marking:**

It is assumed that while the product is in normal use, any batteries associated with real-time clocks or battery-backed RAM will be replaced at the regular intervals.

The EFUP relates only to the environmental impact of the product in normal use, it does not imply that the product will continue to be supported for 50 years.

Recycling information

Network Electronics provides assistance to customers and recyclers through our web site http://www.network-electronics.com. Please contact Network Electronics' Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Network Electronics or its agents for recycling, the following general information may be of assistance:

Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.

All major parts are marked or labelled to show their material content.

Depending on the date of manufacture, this product may contain lead in solder.

Some circuit boards may contain battery-backed memory devices.