

Digital Data Processor Card (DDPC)

COBHAM

The most important thing we build is trust.

Applications

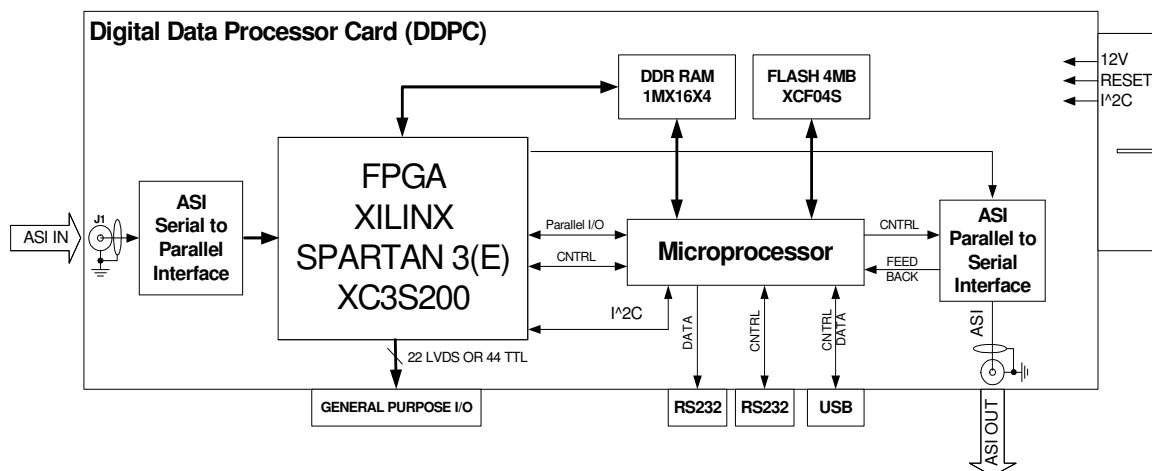
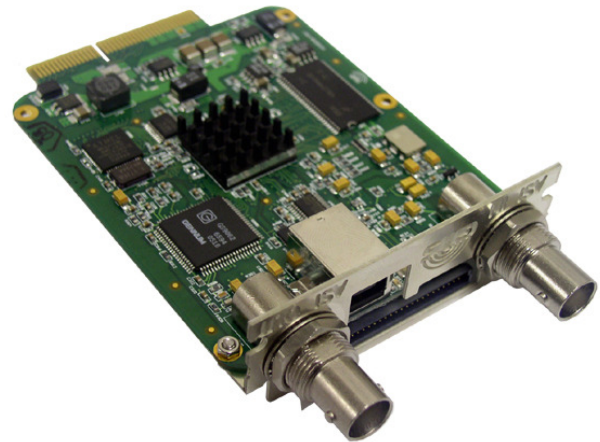
- High-Security Surveillance Applications
- UAV/UGV Applications
- Sports, POV and ENG

Key Processor Features

- Works with MSR
- ASI IN/OUT
- Generic Parallel I/O
- Large FPGA
- UP Controlled

Firmware Applications

- High-Speed Serial Data
- AES Decryption
- User Data Extraction
- Hi-Throughput 4K
- Custom Applications
- Hi throughput 4K



The Digital Data Processor Card (DDPC) is designed to plug-into and work with the Messenger Smart Receiver (MSR) to enable special Transport Stream (TS) processing functions. In most applications, the ASI output of the MSR receiver is cabled to the ASI input of the DDPC. The TS is extracted into a large Field Programmable Gate Array (FPGA) where most of the high-speed data processing occurs. After the processing is complete, the application specific process outputs can be presented to the ASI output circuit, USB-1, RS-232 Data or generic digital data interface. An on-board microprocessor is used for set-up, monitoring, and special low-speed processing operations. The DDPC can be controlled through the RS-232C, USB-1, or I²C interface. Most MSR applications are controlled through the MSR control SW through the MSR's control interface.

Specifications subject to change without prior notice
Typical values shown unless min or max is specified
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Application Specific Firmware downloads are available for the following applications:

AES Decryption Option

Secure communications is achieved with GMS' AES Encryption option. In this application, the encrypted AES stream from the MSR is decrypted in the DDPC and decrypted TS is provided to the DDPC's ASI output port. The 128-bit User Key is entered via the control interface with or without local key storage.

High-Speed Data Option

In this application, the normal Audio/Video/User Data TS is replaced by a generic high-speed digital data TS. The transmitter outputs a programmable digital clock that is used to sample generic serial digital data presented to the input of the card. This data is formatted into a DVB-T compliant TS and is transmitted. The ASI output of the MSR is sent to the DDPC which extracts the digital data, recovers the timing and outputs data/clock through both a LVTTTL and VHDL differential interface. This option can be combined with the AES option to provide security in the link or with the User-Data Extraction option.

User-Data Extraction Option

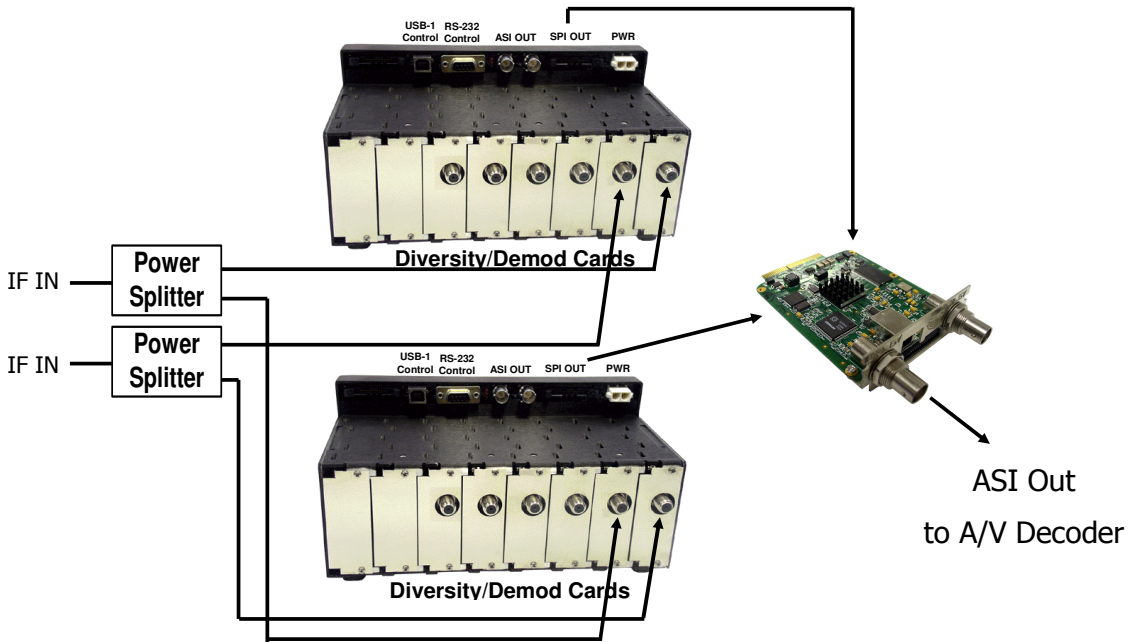
This option provides extraction of a low-rate digital data stream that is added in the Messenger Transmitter to either the normal Audio/Video TS or the High-Speed Data option's TS. The ASI output of the MSR is sent to the DDPC which extracts the user-data and then, through the micro-processor presents the data to the RS-232C interface. The TS is output via the DDPC's ASI output interface which is normally sent to a MPEG decoder. This option can be combined with the AES option to provide security in the link or with the User-Data Extraction option.

Hi Throughput 4K Option

GMS' transmitters normally output 2K carriers and comply with the DVB-T modulation standard. This C-OFDM format is used in Europe and several other countries in the world and provides from ~3.5 Mbps to ~32 Mbps of data throughput. The higher the data rate, the less robust the link becomes. From highest throughput to lowest the data carrier modulation goes from 64 QAM to 16-QAM to QPSK. For each step, the link gains ~5.1 dB. This equates to a 80% increase in operating range! For certain applications like HD and multiple programs in a single TS Wireless Transmission, it is desirable to have greater throughput rates. If the user can utilize more RF bandwidth (12, 14, or 16 MHz), then the 4K Option can be used to double the throughput! Often, the 4K option can provide the same throughput that can be achieved with 2K with a lower modulation format dramatically increasing the system range (+80%). If higher picture quality is desired, the same Link robustness can be achieved by switching to 4K with double the throughput which can equate to a dramatic increase in Video quality!

On the receive side, the 4K option works by combining the output of two MSRs. Each BDC output IF signal is split and presented to the corresponding Tuner/Demod of each MSR which processes $\frac{1}{2}$ of the carriers. The reconstruction of the original TS occurs in the DDPC.

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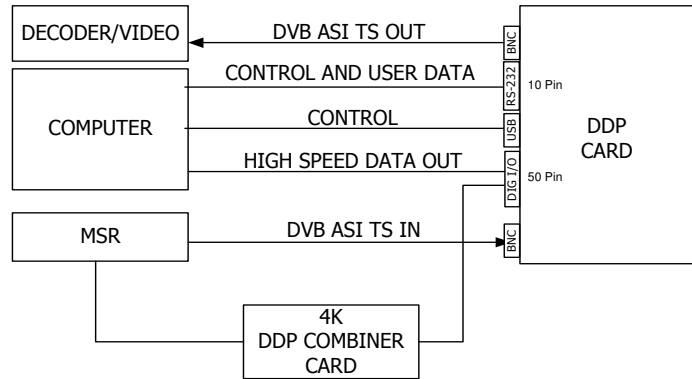
A 50-pin digital I/O interface from the FPGA is available for special custom applications. The DDPC is normally powered from the MSR's back plane. However, the board can be powered from its JST connector.



MSR w/TUNER/BDCC/DDPC

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Specifications

ASI Interfaces

Number of Interfaces: Qty 1 – Input, Qty 1 - Output
Per EN 300 744,

Digital broadcasting systems for Television, sound and data services; Framing structure, channel coding and Modulation for digital terrestrial television.

Per ISO/IEC 13818-1

GENERIC CODING OF MOVING PICTURES AND ASSOCIATED AUDIO: SYSTEMS

Connectors: BNC-F, one each

Digital Data Interfaces

Interface Type: Programmable, LVTTTL, LVDS

Number of I/O lines: 44 - LVTTTS, 22 – LVDS
(Outputs can be mixed type)

Connector: 50 Pin, ERNI Inc., PN: 467127

Control Interfaces

DDPC is designed to be controlled through its I²C, USB-1 or RS-232 control ports via the supplied Application specific MS Windows based control application.

Connector Type: 10 Pin, JST SM10B-SRSS-TB

Pin	Signal	Description
1	Gnd	Ground Connection
2	CNTL Tx	Transmit Control
3	CNTL Rx	Receive Control
4	Gnd	Ground Connection
5	DATA Tx	Transmit User Data
6	DATA Rx	Receive User Data
7	Gnd	Ground Connection
8	SDA	I ² C Data
9	SCL	I ² C Clock
10	Gnd	Ground Connection

Status Indicators

System Active LED

The Active LED indicates that the system has power, when solid, and data is being processed, when blinking.

Function Active LED

The Function Active LED indicates that data is being modified by the DDPC. If the light is off then the data is not being modified and is leaving the same as it enters.

Power

Source: From MSR (Internal) or External

Voltage: 9 - 15 VDC

Current: Application Dependant

External Connector: 2 pin, AMP 350786-2

Internal Connector: 80 pin PCB edge connector, mates with SAMTEC MEC1-140-02-F-D-A

Environment

Temperature: -10° to +70° C base plate

Humidity: Up to 100% non-condensing

Mechanical

Size (inches): 3.8 x 2.78 x 0.5 (Less Connectors)

(cm) 9.65 x 7.06 x 1.27

Weight: 2.0 oz (56.5 grams)

Firmware Applications

- AES Description
- High-Speed Digital Data Extraction
- Low-Rate, User- Data Extraction
- High-Throughput 4K Processing

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