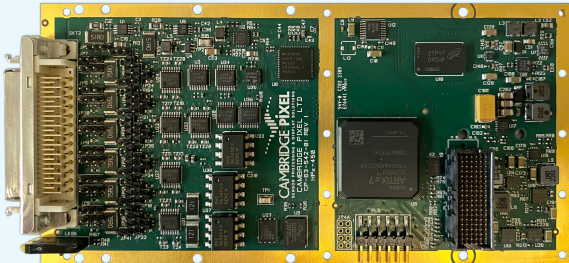


HPx-450

XMC Radar Input Card



Features:

- High performance primary radar acquisition card
- XMC form factor for hosting on SBC
- Two sets of radar inputs:
 - Analogue radar video
 - Trigger
 - ACP/ARP
- Single or dual-stream versions
- All versions support dual redundant mode
- Dual-stream versions support dual independent radars or dual sampling of one radar
- 125 MHz sample rate with 12-bit A-to-D
- Wide range of input signal support:
 - Single-ended, RS422 or open-collector
 - 50 Ohm, 75 Ohm or high impedance video input
 - Opto-coupled inputs for noise immunity
- 8-bit digital inputs with clock
- Parallel azimuth support
- Serial azimuth support, including RADDs RDS II (MIL-STD-751B)
- Programmable pre-trigger compensation
- Optional end-of-range input signal
- Programmable mixing of analogue and digital videos
- Loss of signal detection
- Supported under Windows and Linux
- C/C++/.NET board support library
- On-board test pattern generator
- Wide range of radars supported

The HPx-450 is an enhanced-performance XMC radar input card. The card is capable of capturing and processing analogue and digital primary radar video from up to two radars. The card may be used with a board support library for basic radar signal acquisition, or else with Cambridge Pixel's SPx software for complex processing, tracking or display requirements.

The HPx-450 card supports a number of multi-channel input modes, including dual redundancy and fully independent dual-stream capture. This flexibility allows the number of radar input cards to be reduced while retaining system capability.

Radar Capture

The HPx-450 interfaces to analogue or digital radar signals, and provides a flexible set of input options to handle a wide range of radar types. A flexible mixing capability allows a combination of analogue and digital inputs to be captured and combined. The HPx-450 card provides a dual set of inputs, allowing up to two independent radars to be connected to the same card. Analogue radar video is captured at up to 125 MHz using high precision analogue to digital converters with 12-bit resolution. The captured video(s) can be processed as single or dual-streams, depending upon the version of the card, and can also be optionally down-sampled to reduce the data rate.

Input Signals

The HPx-450 accepts radar video, trigger and azimuth signals in ACP/ARP, parallel or serial formats, including RADDs RDS II (MIL-STD-751B). A wide variety of signal types and input voltages are supported, allowing the card to support many different radar models. The card provides a capability to detect missing signals in order to provide software alarms for loss of triggers or azimuth data.

Board Support Library and SPx Software

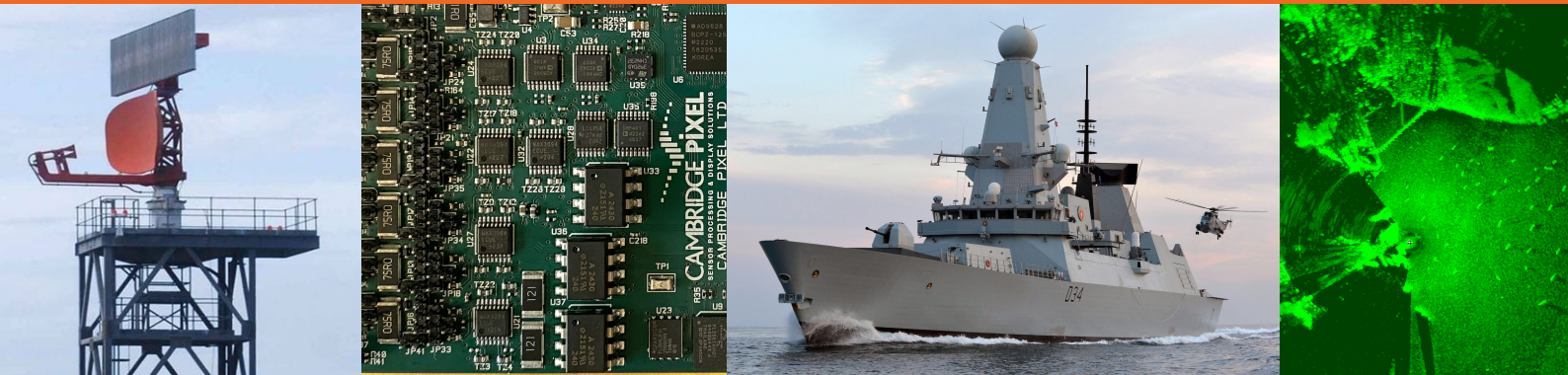
A low-level board support library is available to provide a C++ class interface to configure the board and capture video, providing low-level access to the video samples. Example code is available for Windows and Linux. Alternatively, Cambridge Pixel's extensive SPx software is available to provide advanced processing and display of the radar video data. SPx software can be supplied in the form of a library for use in custom application code or as ready-made applications, such as SPx Server, which have built-in support for the HPx-450 card.

Dual-Stream Functionality

Dual-stream versions of the HPx-450 may be used in a number of ways, including:

- Dual sampling of one radar video at different rates – typically, this might be higher sampling for short ranges to get maximum close-in detail, with lower sampling across the full radar range to give maximum coverage.
- Dual independent radars – simultaneous, independent capture of two separate radars

DATASHEET



Architecture

Form Factor:	XMC
Interface:	XMC/PCIe x4
Programming:	C/C++/.NET software library
Platform:	Windows 11, Linux

Functional

Radar Video:	2x Analogue (configurable gain/offset in range -5V to +5V), 50 Ω, 75Ω or high impedance termination (link selectable) 2x Digital (RS422) with clock
Azimuth Data:	2x ACP/ARP inputs, configurable for: RS422 differential, discrete single-ended signals. Single-ended options for: opto-coupled inputs for electrical isolation, selectable 75Ω or high impedance, open collector (1kΩ pull-up to 5V) 1x parallel azimuth
Trigger:	2x trigger inputs, configurable for: RS422 differential, discrete single-ended signals. Single-ended options for: opto-coupled inputs for electrical isolation, selectable 75Ω or high impedance, open collector (1kΩ pull-up to 5V) Programmable range zero trigger delay
Video Combiner:	Programmable mix of analogue and digital inputs using LUT
Test Generation:	Built-in test pattern generator
Output:	Radar returns onto XMC/PCIe bus
Radar Capture:	Single or dual-stream radar acquisition Programmable return length up to 64k Staggered PRFs supported 12-bit A-to-D

Connectors

Radar Input:	50W MDR connector for videos, trigger and ACP/ARP
XMC:	Standard XMC connector

Performance

Sample Frequency:	125 MHz
Maximum input BW:	60 MHz
PRF:	0 to 16 kHz
Samples per return:	Up to 64k
Returns per scan:	Up to 16k
Data transfer rate:	Up to 500 MB/s peak (250 MB/s sustained)
Scan rate:	Up to 120 rpm

Environmental

Cooling:	Forced air cooling
Temperature:	0°C to 55°C (operational), -40°C to 85°C (storage) Extended temperature version -20°C to +70°C available

Software Support

Board support library (C/C++/.NET)
SPx Development Library (SDK)
RadarView Radar Display Software
SPx Server (Plot Extraction, Tracking & Distribution)

Ordering Information

542-100	HPx-450 XMC Radar Input Card (Single-stream)
542-110	HPx-450 XMC Radar Input Card (Dual-stream)
542-100-ET1	HPx-450 XMC Radar Input Card (Single-stream, Ext. Temp.)
542-110-ET1	HPx-450 XMC Radar Input Card (Dual-stream, Ext. Temp.)

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