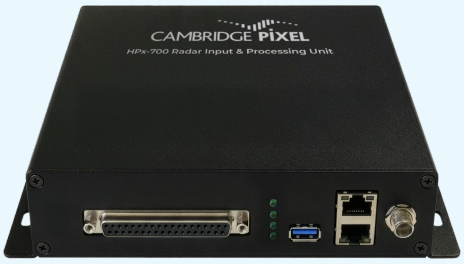
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HPx-700

Radar Input & Processing Unit



Features:

- Small form factor radar interfacing and processing platform
- Upgrade civil or military analogue radar systems
- Extend service life of legacy hardware
- Overcome reliability and obsolescence issues with older radar processing systems
- High resolution radar signal acquisition
- Onboard ARM-64 processor for applications including network distribution, radar plot/track processing, record/replay and fusion of radar streams
- No host PC required
- Standalone case (with an external mains PSU)
- Board-only form factor available to OEMs
- Primary radar digitisation and network distribution/streaming
- Pin-compatible with HPx-410 PCIe card
- Supports dual radar channel operation
- Wide array of pre-built radar interface cables
- Embedded SPx Server software for radar distribution, detection and tracking
- Dual RJ45 gigabit Ethernet interfaces

The HPx-700 is Cambridge Pixel's next-generation small form factor radar interfacing and processing platform for upgrading analogue civil and military radar systems. The unit helps overcome the inherent reliability and obsolescence issues with older radar processing systems and provides a solid upgrade path to extend service life. It features a fully-integrated modular design, comprising high resolution radar signal acquisition, alongside onboard network distribution and plot/track processing hardware. Unlike PCIe and XMC cards, the HPx-700 does not require a host PC, enabling more compact, reliable deployments. The HPx-700 is primarily available as a small form factor unit in a standalone case (with an external mains PSU). However, for OEM customers, it is also available in a board-only form factor.

Onboard 64-bit ARM Processor

The HPx-700's onboard Broadcom BCM2712 64-bit ARM processor supports embedded versions of Cambridge Pixel's family of SPx software modules. The processor features a quad core Cortex-A76 (ARMv8) 64-bit System-on-Chip (SoC) and has guaranteed production through to 2035. A wide range of system functions are supported by the HPx-700, including combinations of:

- Primary radar digitisation and network distribution/streaming
- Radar plot extraction (including IFF processing)
- Radar target tracking
- Radar stream record/replay
- Fusion of radar streams

Radar Signal Acquisition

The HPx-700 includes a flexible radar hardware interface that is pin-compatible with Cambridge Pixel's existing HPx-410 PCIe card. The 37-way radar input connector supports dual radar channel operation and interfaces with RS-422, single-ended or open-collector signal types for maximum compatibility. It accepts radar video, trigger and azimuth signals in the form of ACP/ARP or serial data.

Backwards compatibility with the HPx-410 gives access to a wide array of pre-built radar interface cables, alongside detailed Engineering Application Notes which guide the integrator on how to interface to specific makes and models of radar. The range of cables includes various generic signal breakout cables, as well as radar-specific cables for a diverse range of radars from: Consilium, Furuno, JRC, Kelvin Hughes, Koden, Sperry Marine, STN Atlas and Terma.

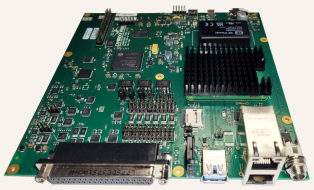
Embedded SPx Server Processing

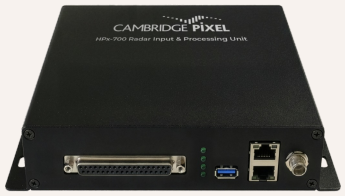
The HPx-700 includes an embedded version of Cambridge Pixel's proven SPx Server software. As standard, there are three main versions of the product, each of which progressively adds additional processing functionality:

HPx-700 Radar Input & Processing Unit Specification

CP-16-700-01, V1.1

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- **HPx-700 Distribution** – includes primary radar digitisation and network streaming
- **HPx-700 Detection** – adds both plot extraction and proximity detection processing
- **HPx-700 Tracking** – offers a complete multi-hypothesis primary radar tracking solution

Optional features such as radar stream record/replay, sensor fusion and IFF processing can be provisioned through the purchase of additional software runtime licenses. Configuration of the HPx-700 is achieved through the built-in web GUI. The web GUI can also be used to update the functionality of the unit and enable optional features at a later date.

I/O Connectivity

The HPx-700 includes dual RJ45 Gigabit Ethernet interfaces, which are used for web GUI control connections and for distributing radar video, plot reports and track reports. A variety of video, plot and track report formats are supported, including Cambridge Pixel's SPx format and numerous categories of Eurocontrol's ASTERIX format as well as NMEA 0183 TTM messages. Additional I/O is provided in the form of a USB Type-A connector on the front panel.

HPx-700 Ordering Information

Description	P/N
HPx-700 Distribution – standalone unit with mains PSU	700-160
HPx-700 Detection – standalone unit with mains PSU	700-170
HPx-700 Tracking – standalone unit with mains PSU	700-180
HPx-700 Distribution – OEM card	700-110
HPx-700 Detection – OEM card	700-120
HPx-700 Tracking – OEM card	700-130

HPx-700 Specification

Form Factor:

Small form factor standalone unit with external mains PSU or board-only form factor for OEM customers.

Radar Video:

- 2x Analogue (configurable gain/offset in range -5V +5V), 50 Ohm, 75 Ohm or high impedance termination (link selectable).
- 8x Digital (RS422) with clock (7 in dual radar mode).
- Programmable mix of analogue and digital inputs.

Azimuth:

- 2x ACP/ARP inputs, configurable for: RS422 differential, discrete single-ended signals.
- Single-ended options for: opto-coupled inputs for electrical isolation, selectable 75 Ohm or high impedance, open collector (1 kOhm pull-up to 5V).

Trigger:

- 2x trigger inputs, configurable for: RS422 differential, discrete single-ended signals.
- Single-ended options for: opto-coupled inputs for electrical isolation, selectable 75 Ohm or high impedance, open collector (1 kOhm pull-up to 5V).

Radar Capture:

- 37W D connector for video, trigger and ACP/ARP.
- Single or dual-stream radar acquisition.
- Programmable return length up to 64k.
- Staggered PRFs supported.
- 12-bit A-to-D.

Accessories:

Radar interface cables, spare mains PSU.

For more information, please contact:

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