



HAVELSAN

HAVELSAN C4ISR HARDWARE GROUP PRODUCT CATALOG





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PLATFORM DATA DISTRIBUTION SYSTEM

FLEETSTAR-300/400

FLEETSTAR-200

FLEETSTAR-100

FLEETSTAR-50

SUBSTAR-1000





PLATFORM DATA DISTRIBUTION SYSTEM

The HAVELSAN Platform Data Distribution System (PDDS) collects and distributes platform sensor data to all client subsystems to ensure the safety and efficiency of navigation and combat operations. With a robust and scalable system architecture, PDDS offers redundancy and fault tolerance to maintain service continuity. Its unique features and design make it heart of the ship, enabling real-time data sharing and decision-making. Since 2009, it has been successfully serving as the preferred data distribution system for the Turkish Navy and many foreign naval forces, enhancing operational capabilities and mission effectiveness.

KEY FEATURES

- ▶ Data Collection and Labeling from Ship Sensors and Systems
- ▶ Data Control, Filtering, Plausibility Checking
- ▶ Data Distribution to Multiple Receivers in Different Formats, Interfaces and Protocols
- ▶ Data Coherence Between All Platform Systems
- ▶ Data Prioritization
- ▶ Data Displays, Recording and Analysis
- ▶ Precise Time Server
- ▶ Simulation of Sensor Data
- ▶ Redundancy with Hardware/Software
- ▶ Reliable, Robust, 24/7 Operation
- ▶ Smart, Flexible, Modular, Easily Expandable and Scalable
- ▶ High Speed and Performance

DATA INPUT OPTIONS*

- ▶ INS, GYRO
- ▶ GNSS
- ▶ Magnetic Compass
- ▶ EM-Log, Doppler-Log
- ▶ Echo Sounder
- ▶ Ship Engine Systems
- ▶ Meteorological Sensors
- ▶ Ship Engine Systems or Other Systems (with ICD)

DATA OUTPUT OPTIONS*

- ▶ Combat Management Systems
- ▶ Weapons
- ▶ Tactical Sensors (Radars, EOD, FCR etc.)
- ▶ Communication Systems
- ▶ AIS/WAIS
- ▶ ECDIS/WECDIS
- ▶ Ship Auxiliary Systems (Helicopter ASIST etc.)
- ▶ Various Data Display Units or other systems (with ICD)

INTERFACE OPTIONS*

- ▶ Ethernet (Up to 72 Ports)
- ▶ Fiber Ethernet
- ▶ RS-422 (Up to 64 Ports), RS232/485
- ▶ Synchro (Up to 42 Channels, Fine/Coarse)
- ▶ HDLC Serial Data
- ▶ Time STANAG HQ/1PPS, IRIG-B, NTP, SNTP
- ▶ CAN
- ▶ ARINC429
- ▶ MIL-STD-1553
- ▶ 4/20 mA Current Loop

OPTIONAL UNITS*

- ▶ RS-422 Selection Box
- ▶ RS-422 Distribution Box
- ▶ Synchro Conversion Unit
- ▶ Gyro Heading Repeaters (Analog and Digital)
- ▶ NTP Wall Clocks
- ▶ Pelorus Stand
- ▶ Bearing Sights

*Can be tailored according to customized requirements.

ENVIRONMENTAL AND ELECTROMAGNETIC CONDITIONS

- ▶ MIL-STD-810
- ▶ MIL-STD-167/1
- ▶ MIL-STD-461
- ▶ MIL-STD-1310
- ▶ MIL-STD-1399



FleetStar-300/400

This PDDS configuration is suitable for Large Patrol Vessels, Frigates, Corvettes, Landing Ship, Tank (LST), Landing Helicopter Dock (LHD), and larger size platforms.

SUB-COMPONENTS

- ▶ 2x PDDS Main Cabinets 25U
- ▶ 1610mm x 650mm x 1004mm (W x H x D)
- ▶ Main Computer Subrack
- ▶ Single Board Computer
- ▶ RS-422, Ethernet, Time Signaling, I/O Boards
- ▶ Ethernet Switches
- ▶ Electrical Insulation and Distribution Unit
- ▶ Synchro D/S, S/D Converters
- ▶ Time System and Time Distribution Units
- ▶ Cabinet Computer
- ▶ Uninterruptible Power Supply
- ▶ 2x PDDS Distribution Panels (766mm x 756mm x 504mm (W x H x D))
- ▶ Control and Display Units
- ▶ RS422 Selection and Distribution Units

DATA INPUT OPTIONS*

- ▶ INS, GYRO
- ▶ GNSS
- ▶ Magnetic Compass
- ▶ EM-Log, Doppler-Log
- ▶ Echo Sounder
- ▶ Meteorological Sensors
- ▶ Ship Engine Systems

DATA OUTPUT OPTIONS*

- ▶ Combat Management Systems
- ▶ Weapons
- ▶ Tactical Sensors (Radars, EOD, FCR etc.)
- ▶ Communication Systems
- ▶ AIS/WAIS
- ▶ ECDIS/WECDIS
- ▶ Ship Auxiliary Systems (Helicopter ASIST etc.)
- ▶ Various Data Display Units

INTERFACE OPTIONS*

- ▶ Ethernet (Up to 72 Ports)
- ▶ Fiber Ethernet
- ▶ RS-422 (Up to 64 Ports), RS232/485
- ▶ Synchro (Up to 42 Channels, Fine/Coarse)
- ▶ HDLC Serial Data
- ▶ Time STANAG HQ/1PPS, IRIG-B, NTP, SNTP
- ▶ CAN
- ▶ ARINC429
- ▶ MIL-STD-1553
- ▶ 4/20 mA Current Loop

*Can be tailored according to customized requirements.

ENVIRONMENTAL AND ELECTROMAGNETIC CONDITIONS

- ▶ MIL-STD-810
- ▶ MIL-STD-167/1
- ▶ MIL-STD-461
- ▶ MIL-STD-1310
- ▶ MIL-STD-1399



FleetStar-200

This PDDS configuration is suitable for offshore Petrol Vessels (OPV), Mine Hunters, Patrol Vessels, Fast Attack Vessels and similar sized platforms.

SUB-COMPONENTS

- ▶ PDDS Main Cabinet 25U
- ▶ 1610mm x 650mm x 1004mm (W x H x D)
- ▶ Uninterruptible Power Supply
- ▶ Control and Display Units

DATA INPUT OPTIONS*

- ▶ INS, GYRO
- ▶ GNSS
- ▶ Magnetic Compass
- ▶ EM-Log, Doppler-Log
- ▶ Echo Sounder
- ▶ Meteorological Sensors
- ▶ Ship Engine Systems

DATA OUTPUT OPTIONS*

- ▶ Combat Management Systems
- ▶ Weapons
- ▶ Tactical Sensors (Radars, EOD, FCR etc.)
- ▶ Communication Systems
- ▶ AIS/WAIS
- ▶ ECDIS/WECDIS
- ▶ Ship Auxiliary Systems (Helicopter ASIST etc.)
- ▶ Various Data Display Units

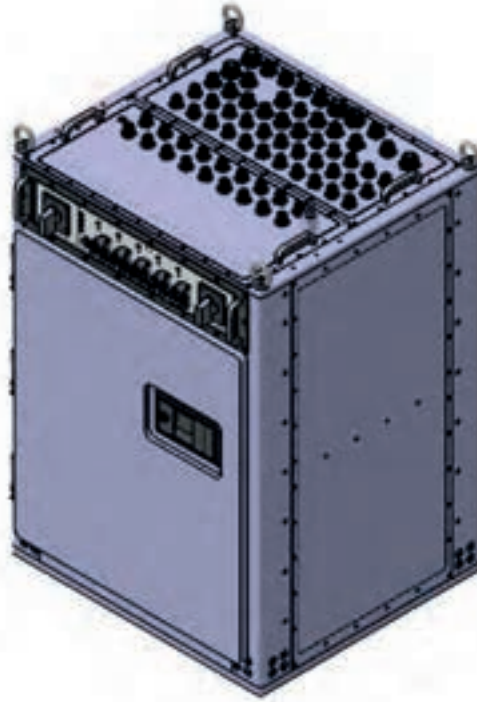
INTERFACE OPTIONS*

- ▶ Ethernet (Up to 72 Ports)
- ▶ Fiber Ethernet
- ▶ RS-422 (Up to 64 Ports), RS232/485
- ▶ Synchro (Up to 42 Channels, Fine/Coarse)
- ▶ HDLC Serial Data
- ▶ Time STANAG HQ/1PPS, IRIG-B, NTP, SNTP
- ▶ CAN
- ▶ ARINC429
- ▶ MIL-STD-1553
- ▶ 4/20 mA Current Loop

*Can be tailored according to customized requirements.

ENVIRONMENTAL AND ELECTROMAGNETIC CONDITIONS

- ▶ MIL-STD-810
- ▶ MIL-STD-167/1
- ▶ MIL-STD-461
- ▶ MIL-STD-1310
- ▶ MIL-STD-1399



FleetStar-100

This PDDS configuration is suitable for Mine Hunters, Fast Attack Crafts, Missile Bots or smaller size platforms.

SUB-COMPONENTS

- ▶ PDDS Main Cabinet 12U
- ▶ 908 mm x 650 mm x 656 mm (W x H x D)
- ▶ Control and Display Units

DATA INPUT OPTIONS*

- ▶ INS, GYRO
- ▶ GNSS
- ▶ Magnetic Compass
- ▶ EM-Log, Doppler-Log
- ▶ Echo Sounder
- ▶ Meteorological Sensors
- ▶ Ship Engine Systems

DATA OUTPUT OPTIONS*

- ▶ Combat Management Systems
- ▶ Weapons
- ▶ Tactical Sensors (Radars, EOD, FCR etc.)
- ▶ Communication Systems
- ▶ AIS/WAIS
- ▶ ECDIS/WECDIS
- ▶ Ship Auxiliary Systems (Helicopter ASIST etc.)
- ▶ Various Data Display Units

INTERFACE OPTIONS*

- ▶ Ethernet (Up to 18 Ports)
- ▶ RS-422 (Up to 36 Ports), RS232/485
- ▶ Synchro (Up to 42 Channels, Fine/Coarse)
- ▶ HDLC Serial Data

*Can be tailored according to customized requirements.



FleetStar-50

This PDDS configuration is suitable for Unmanned Surface Vessels and similar platforms.

KEY FEATURES

- ▶ Data Collection and Labeling from Ship Sensors and Systems
- ▶ Data Control, Filtering, Plausibility Checking
- ▶ Data Distribution to Multiple Receivers in Different Formats, Interfaces and Protocols
- ▶ Data Coherence Between All Platform Systems
- ▶ Data Prioritization
- ▶ Data Displays, Recording and Analysis
- ▶ Simulation of Sensor Data
- ▶ Reliable, Robust, 24/7 Operation
- ▶ Smart, Flexible
- ▶ High Speed and Performance

SUB-COMPONENTS

- ▶ PDDS Main Unit
- ▶ 400mm x 400mm x 100mm (W x H x D)
- ▶ Control and Display Units

DATA INPUT OPTIONS*

- ▶ INS, GYRO
- ▶ GNSS
- ▶ Magnetic Compass
- ▶ EM-Log, Doppler-Log
- ▶ Echo Sounder
- ▶ Meteorological Sensors
- ▶ Ship Engine Systems

DATA OUTPUT OPTIONS*

- ▶ Combat Management Systems
- ▶ Weapons
- ▶ Tactical Sensors (Radars, EOD, FCR etc.)
- ▶ Communication Systems
- ▶ AIS/WAIS
- ▶ ECDIS/WECDIS
- ▶ Ship Auxiliary Systems (Helicopter ASIST etc.)
- ▶ Various Data Display Units

INTERFACE OPTIONS*

- ▶ Ethernet (Up to 6 Ports)
- ▶ RS-422 (Up to 11 Ports)

*Can be tailored according to customized requirements.



SubStar-1000

HAVELSAN SDDS is designed to receive and distribute data from various sensors and systems in real time, ensuring submarines operate efficiently in their missions. It records and stores all mission-critical data for over 50 days, enabling analysis of navigational safety and operational effectiveness, with the ability to review data on board or at shore. Featuring a redundant and expandable architecture, SDDS guarantees service continuity and fault tolerance tailored for different types of submarines. Additionally, it integrates with the HAVELSAN Submarine Automatic Performance Analysis System (HDOPERA) to measure and analyze the performance of combat systems, enhancing operational effectiveness and supporting informed decision-making. Already in service onboard various French or German designed submarines.

KEY FEATURES

- ▶ Data Collection and Labeling from Sensors and Systems
- ▶ Data Control, Filtering, Plausibility Checking
- ▶ Data Distribution to Multiple Receivers in Different Formats, Interfaces and Protocols
- ▶ Data Coherence Between All Platform Systems
- ▶ Data Prioritization
- ▶ Data Display, Recording and Analysis
- ▶ Precise Time Server
- ▶ Simulation of Sensor Data
- ▶ Redundancy Through Two Cabinets
- ▶ Reliable, Robust, 24/7 Operation
- ▶ Smart, Flexible, Modular, Easily Expandable and Scalable
- ▶ High Speed and Performance

OPTIONAL UNITS*

- ▶ Synchro, Serial, Discrete Interface Unit

SUB-COMPONENTS

- ▶ 2x Cabinets
- ▶ 1200 x 650 x 600mm (W x H x D)
- ▶ Single Board Computers
- ▶ RS-422, Ethernet, Time Signaling, I/O Boards
- ▶ Ethernet Switches
- ▶ Interface Module
- ▶ Cabinet HMI
- ▶ Synchro Converters
- ▶ GNSS Receiver
- ▶ Beacon Receiver
- ▶ Time Distribution Unit
- ▶ Video Distribution Unit
- ▶ Video Recording Unit
- ▶ Cabinet Control and Monitoring Unit
- ▶ Buffer Modules

Display Modules

- ▶ 12,1" Control and Display Module
- ▶ 15" Control and Display Panel

INTERFACE OPTIONS*

- ▶ ETHERNET
- ▶ RS-232/422/485, HDLC Serial
- ▶ Synchro
- ▶ Current Loop
- ▶ 400 ppm
- ▶ Discrete
- ▶ CAN
- ▶ SDI/HDI/Composite/S-VIDEO
- ▶ HQ/1PPS, IRIG-B, NTP V4

CONNECTED SENSORS/SYSTEMS

- ▶ INS, Gyro, GNSS, EM-Log, Doppler-Log, CTD, EchoSounder, Depth Sensor, CMS, SONAR, Weapons, SCC, HMP, Data Loggers, EMCS, ESM, RADAR, Periscopes, TCM, AIS/WAIS, SATCOM, ECDIS/WECDIS, Repeaters etc.

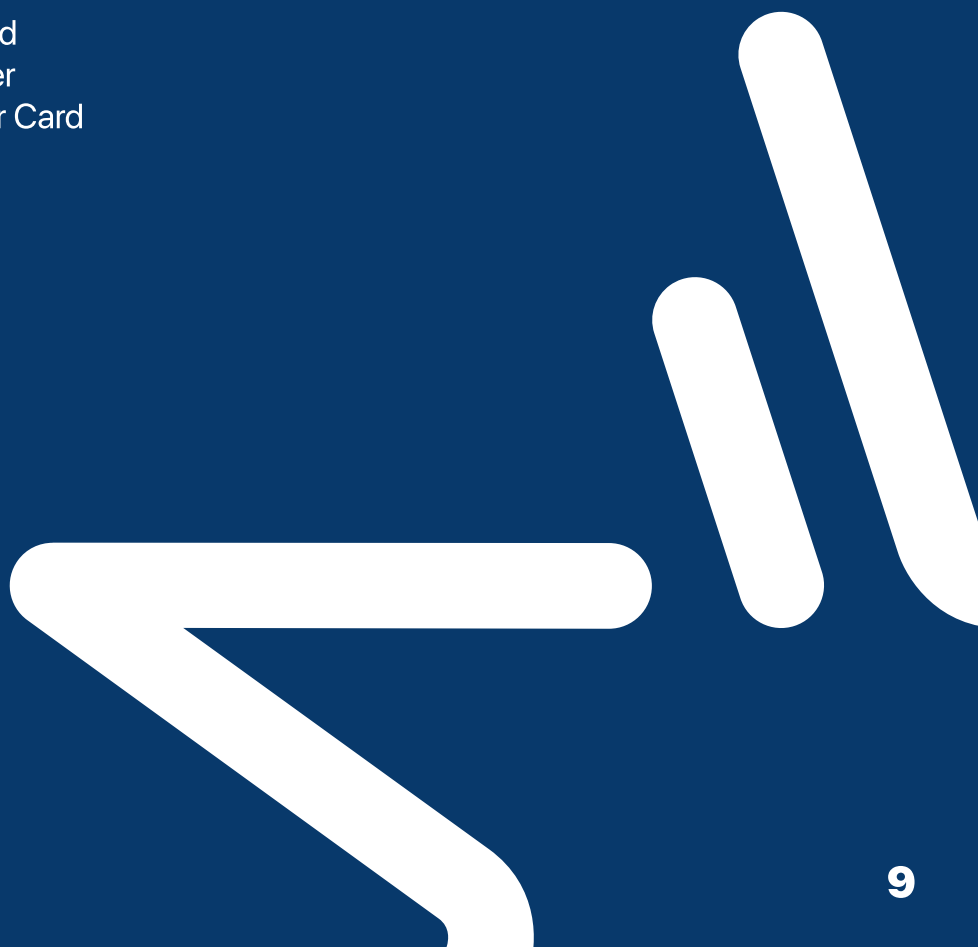
ENVIRONMENTAL AND ELECTROMAGNETIC CONDITIONS

- ▶ MIL-STD-810F
- ▶ MIL-STD-1474D
- ▶ MIL-STD-461E
- ▶ MIL-STD-1310
- ▶ IEC EN60529 IP23
- ▶ IEC EN 60950
- ▶ IEC-61000-4-5

*Can be tailored according to customized requirements.

UNIQUE HARDWARE

CPCI 6U Carrier Card
SOM Zynq 7045
Channel PCI Serial 6U RS-422 Interface Card
CPCI Serial 6U 5 Slots Backplane
6U CPCI Serial Power Card
XMC 4 Port HDLC Card
XMC Time Synchronization Card
6 Channel Digital to Synchro Card
6U Compact PCI Serial Computer
VME64X Single Board Computer Card
VME64X 32 Port IO Card
DC Surge Protector Card
SOM ZYNQ ULTRASCALE





CPCI 6U Carrier Card

The carrier card is for general purpose XILINX ZYNQ SOM. It can communicate with other cards connected to the Backplane card via Backplane with CPCI-S distributions.

TECHNICAL INFORMATION

SUPPLY VOLTAGE

Powered by 24V DC through the backplane connectors.

COMMUNICATION INTERFACES

- ▶ 1 x Ethernet port (1000BASE-T / 100BASE-TX / 10BASE-T) via RJ-45 connection from SoM.
- ▶ 1 x PCIe Ethernet port (10/100/1000 Mbps) via RJ-45 connection on the carrier card.
- ▶ 1 x HDMI V1.4 connection.
- ▶ 1 x XMC connector.
- ▶ 1 x mSATA / mPCIe connector.
- ▶ 16 x RS-422 connections.
- ▶ 2 x CAN FD transceiver interfaces supporting up to 5 Mbps.

COMPLIANCE STANDARDS

- ▶ MIL-STD-461F
- ▶ CS101, CE102
- ▶ RE101, RE102
- ▶ RS101, RS103

MECHANICAL PROPERTIES

- ▶ Board dimensions: 220mm x 233.35mm (6U)



SOM Zynq 7045

The SOM Zynq 7045 features the industrial Xilinx ZynQ SoC with options for XC7Z-030 or XC7Z-045 FPGAs. It includes a dual-core ARM Cortex-A9 for processing. The XC7Z045 variant offers 350K logic cells, 19.2 Mb of block RAM, and 900 DSP slices, while the XC7Z030 offers 125K logic cells, 9.3 Mb of block RAM, and 400 DSP slices. The board is equipped with 1GB DDR3L SDRAM, 512Mb QSPI Flash, 4 GTX transceiver lines, and Gigabit Ethernet PHY with EEPROM for robust connectivity.

TECHNICAL INFORMATION

PROCESSING SYSTEM (PS)

- ▶ Dual-core ARM Cortex-A9 MPCore processor

PROGRAMMABLE LOGIC (PL)

- ▶ FPGA options:
- ▶ XC7Z045:
 - ▶ Kintex-7 FPGA with 350K logic cells
 - ▶ 19.2 Mb block RAM
 - ▶ 900 DSP slices (18x25 MACCs)
- ▶ XC7Z030:
 - ▶ Kintex-7 FPGA with 125K logic cells
 - ▶ 9.3 Mb block RAM
 - ▶ 400 DSP slices (18x25 MACCs)

MEMORY AND STORAGE

- ▶ 1GB DDR3L SDRAM
- ▶ 512Mb QSPI Flash memory

HIGH-SPEED INTERFACES

- ▶ 4 x GTX transceiver lines
- ▶ Gigabit Ethernet PHY and EEPROM



Channel PCI Serial 6U RS-422 Interface Card

The board features 16 RS422/485 channels and can serve as an environmental card within the CPCI architecture. It connects to Single Board Computers (SBCs) via PCIe, which links to the backplane. As a result, it transmits RS422/485 signals over PCIe.

TECHNICAL INFORMATION

GENERAL DESCRIPTION

- ▶ 6U CPCI Serial 16-Channel RS-422/RS-485 communication card
- ▶ 16-port RS-422/485 asynchronous serial controller with PCIe target interface
- ▶ UART 16550 compatible

COMMUNICATION FEATURES

- ▶ 64-byte transmit FIFO per channel
- ▶ 64-byte receive FIFO per channel
- ▶ Readable FIFO levels
- ▶ Global Interrupt Source Register
- ▶ General Purpose 16-bit Timer/Counter
- ▶ Programmable baud rates up to 10 Mbit/s
- ▶ SBC-controlled RS-422 interface loopback test support

POWER SUPPLY

- ▶ Operating voltage: 18–36V DC

ENVIRONMENTAL CONDITIONS

- ▶ Operating temperature range: -40°C to +85°C
- ▶ Front panel EMI gasket for enhanced shielding
- ▶ ESD-protected transceivers (up to ±15kV according to IEC 1000-4-2)

MECHANICAL PROPERTIES

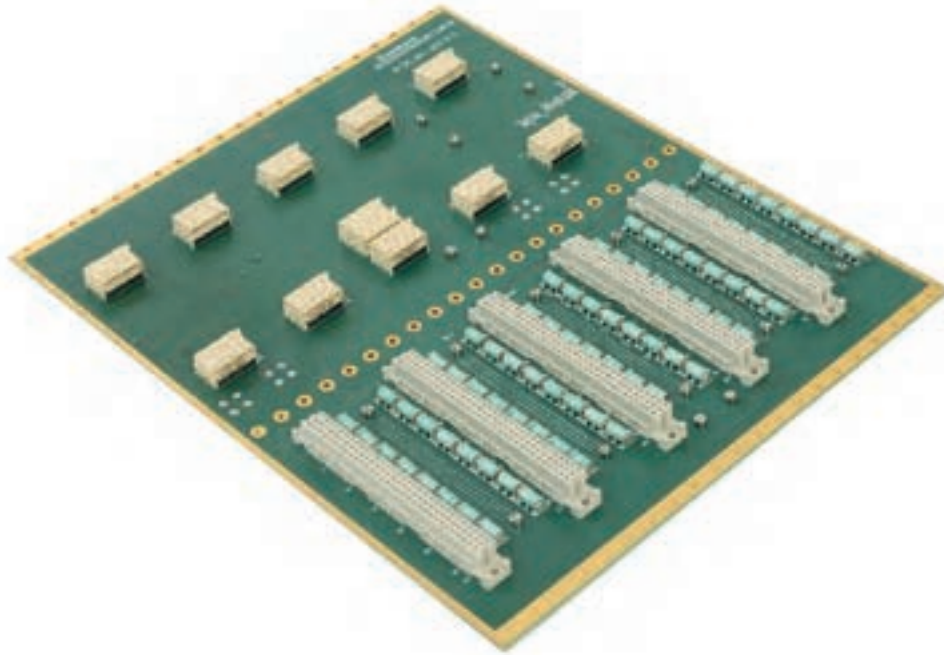
- ▶ Board dimensions: 220mm x 233mm

SOFTWARE SUPPORT

- ▶ VxWorks driver support available

STANDARDS AND CERTIFICATIONS

- ▶ MIL-STD-461F
- ▶ CE102, CS101
- ▶ RE101, RE102
- ▶ RS101, RS103



CPCI Serial 6U 5 Slots Backplane

The backplane card is specifically designed to enable communication between peripheral cards and Single Board Computers (SBCs) within the CPCI architecture, while also providing essential power interfaces for the respective cards.

TECHNICAL INFORMATION

SBC INTERFACE (SINGLE BOARD COMPUTER INTERFACE)

- ▶ 1 slot for SBC connection
- ▶ 5 x TTL input/output interfaces
- ▶ 15 x RS-422 interfaces
- ▶ 1 x RS-232 interface

RS-422/485 CARD INTERFACE

- ▶ 4 slots for RS-422/485 card connections
- ▶ 16 x RS-422/485 communication channels
- ▶ 16-port RS-422/485 asynchronous serial controller with PCIe target interface
- ▶ Power supply input: 9–36V DC

MECHANICAL PROPERTIES

- ▶ Board dimensions: 218.5mm x 262.05mm

ENVIRONMENTAL CONDITIONS

- ▶ Operating temperature range: -40°C to +85°C
- ▶ Level 4 ESD/EFT/surge protection for RS-422/485/232 interfaces

STANDARDS AND CERTIFICATIONS

- ▶ MIL-STD-461F
- ▶ CE102, CS101
- ▶ RE101, RE102
- ▶ RS101, RS103



6U CPCI Serial Power Card

The card performs cabinet control functions including driving the alarm and warning LEDs on the Human-Machine Interface (HMI), controlling the circuit breakers mounted on the cabinet, managing the cabinet door opening sequence, measuring the internal cabinet temperature, and driving the cabinet fans. The card is responsible for AC-DC power conversion, which involves converting the incoming main voltage (115V AC, 60Hz) to a regulated 30.8V DC output required for the operation of internal cabinet equipment. It continuously monitors the output voltage and current to ensure stable operation. The card handles the switching between the ship-supplied battery voltage and the internally generated DC voltage to maintain uninterrupted power supply to the cabinet systems.

TECHNICAL INFORMATION

POWER INPUT

- ▶ 115V AC, 60Hz, 9A max input
- ▶ Maximum 36V DC battery input (for backup purposes)

POWER OUTPUT

- ▶ 2 independent adjustable channels providing 22.4VDC to 30.8VDC output
- ▶ Output power and efficiency: 21.4A per channel with 91% efficiency
- ▶ Adjustable overvoltage, undervoltage, overtemperature, and overcurrent protection

FAN CONTROL

- ▶ 4 x ON/OFF control channels for fans (maximum 32V, 500mA each)

COMMUNICATION INTERFACES

- ▶ 2 x independent bidirectional RS-422 interfaces (redundant)
- ▶ 1 x USB interface (for debugging and monitoring)
- ▶ Real-time current, voltage, and temperature monitoring via RS-422 and USB interfaces

POWER CONTROL FUNCTIONS

- ▶ Output ON/OFF control
- ▶ Easily accessible high-current protections on the front panel for power input and output
- ▶ Fuse and power status indicator LEDs located on the front panel

AUXILIARY OUTPUT CONTROLS

- ▶ 3 x isolated outputs for controlling circuit breakers or relays (up to 60V)
- ▶ 3 x isolated outputs for controlling circuit breakers or relays (up to 30.8VDC)
- ▶ 7 x isolated outputs for LED control (maximum 30.8VDC, 300mA)

SENSOR AND SYSTEM CONTROL INPUTS/OUTPUTS

- ▶ 4 x temperature sensor inputs
- ▶ 2 x open-drain outputs for system control
- ▶ 2 x system control inputs (maximum 30.8VDC)

MECHANICAL PROPERTIES

- ▶ Dimensions: 242mm x 262mm x 40mm
- ▶ Weight: 900g

ENVIRONMENTAL CONDITIONS

- ▶ Operating temperature range: 0°C to +60°C



XMC 4 Port HDLC Card

The XMC 4 Ports HDLC is a synchronous serial controller with four ports and a PCIe target interface. It offers HD68 front connector support for signals including RxD, TxD, and more. Equipped with 14.7456 MHz, 24 MHz, and 10 MHz oscillators, it supports a variety of baud rates, including a synchronous 10 Mbit/s rate. Each channel has a 512 long-word FIFO for high data throughput and various interrupt sources. It includes 2 indicator LEDs for heart beat and PCIe link status, and features a battery-backed RTC for time tagging. Operating on 3.3V/5.0V signaling, it consumes less than 3W of power and is protected against ESD up to $\pm 15\text{kV}$.

TECHNICAL INFORMATION

- ▶ 4-port HDLC synchronous serial controller with PCIe target interface
- ▶ Supports RxD, TxD, RxC, TxC, RTS, CTS, CD, and GND signals via HD68 connector
- ▶ Oscillators:
 - ▶ 14.7456 MHz for standard asynchronous baud rates
 - ▶ 24 MHz for alternative baud rates
 - ▶ 10 MHz (0.28 ppb) high-precision oscillator for synchronous baud rate (10 Mbit/s)
- ▶ 512-word (32-bit) transmit and receive FIFO per channel
- ▶ 16-bit Timer/Counter
- ▶ Dual indicator LEDs (Heartbeat, PCIe link status)
- ▶ On-board battery-backed RTC
- ▶ Operates with 3.3V and 5.0V signaling voltages via XMC connector
- ▶ Power consumption: <3W

ENVIRONMENTAL CONDITIONS

- ▶ Operating temperature: -40°C to $+85^{\circ}\text{C}$
- ▶ Front panel EMI gasket
- ▶ ESD protection up to $\pm 15\text{kV}$ (IEC 1000-4-2)

MECHANICAL PROPERTIES

- ▶ Board dimensions: 149mm x 74mm
- ▶ Weight: 80g

SOFTWARE SUPPORT

- ▶ VxWorks driver support



XMC Time Synchronization Card

XMC Time Synchronization Card is a precision timing and synchronization module designed for systems requiring IRIG-B and HaveQuick time synchronization standards. It supports zero-latency time reads, Match Time output, and offers both isolated input/output capabilities for IRIG-B and 1PPS signals. Equipped with a battery-backed real-time clock (RTC) and low phase-noise 10 MHz oscillator (0.28 ppb), the board ensures highly accurate and reliable time tagging. With robust ESD protection, wide operating temperature range, and MIL-STD-461F compliance, it is ideal for mission-critical military and industrial applications. The board also includes an onboard USB debug interface for monitoring card health status and offers VxWorks driver support for integration into real-time systems.

TECHNICAL INFORMATION

- ▶ Supports IRIG-B and 1PPS inputs as standard
- ▶ Optional synchronization via HaveQuick and IRIG-B signals
- ▶ Zero-latency time reads with Match Time output
- ▶ IRIG-B time code output
- ▶ 4-port isolated RS-422 serial controller for HaveQuick, 1PPS, and IRIG-B communication
- ▶ 0.25V or 10V isolated inputs and outputs for HaveQuick, 1PPS, and IRIG-B
- ▶ On-board 10 MHz low phase noise oscillator (0.28 ppb)
- ▶ 2 x Indicator LEDs:
 - ▶ HaveQuick sync status
 - ▶ IRIG-B sync status
- ▶ 1 x USB debug interface for monitoring card health
- ▶ Battery-backed RTC for accurate time tagging
- ▶ Power supply: Operates with 3.3V and 5.0V signaling voltages via XMC connector
- ▶ Power consumption: <3W

ENVIRONMENTAL CONDITIONS

- ▶ Operating temperature: -40°C to +85°C
- ▶ Front panel EMI gasket
- ▶ ESD protection up to ±15kV according to IEC 1000-4-2

MECHANICAL PROPERTIES

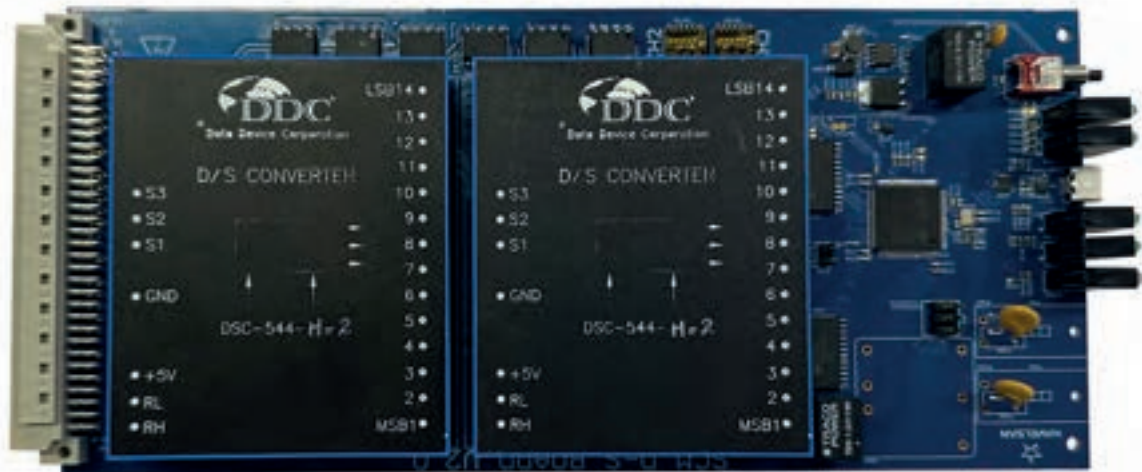
- ▶ Board dimensions: 149mm x 74mm
- ▶ Weight: 80g

SOFTWARE SUPPORT

- ▶ VxWorks driver support

STANDARDS AND CERTIFICATIONS

- ▶ MIL-STD-461F
- ▶ CE102, CS101
- ▶ RE101, RE102
- ▶ RS101, RS103



6 Channel Digital to Synchro Card

A Digital-to-Synchro converter is a specialized circuit controlled via the RS-422 communication protocol. It provides two channels of 14-bit synchro output, which can be configured either as independent outputs or as a coarse/fine pair depending on system requirements.

TECHNICAL INFORMATION

- ▶ Input voltage: 9–36V DC
- ▶ 2 x Synchro channel outputs with a maximum output capability of 6W each
- ▶ Compatible with D-S converter modules manufactured by ECRIM, DDC, and CSI
- ▶ Built-in MCU loopback testing for functional verification of all synchro channel outputs
- ▶ Supports RS-485 and CANBus communication protocols
- ▶ Measurement capability for reference voltage and current
- ▶ Individual IP assignment for each channel
- ▶ Overvoltage and overcurrent protection
- ▶ Wireless software upload and update capability from remote locations
- ▶ Synchro outputs can be monitored externally via status LEDs

ENVIRONMENTAL CONDITIONS

- ▶ Operating conditions compliant with industrial and military environments

MECHANICAL PROPERTIES

- ▶ Board dimensions: 142mm x 142mm

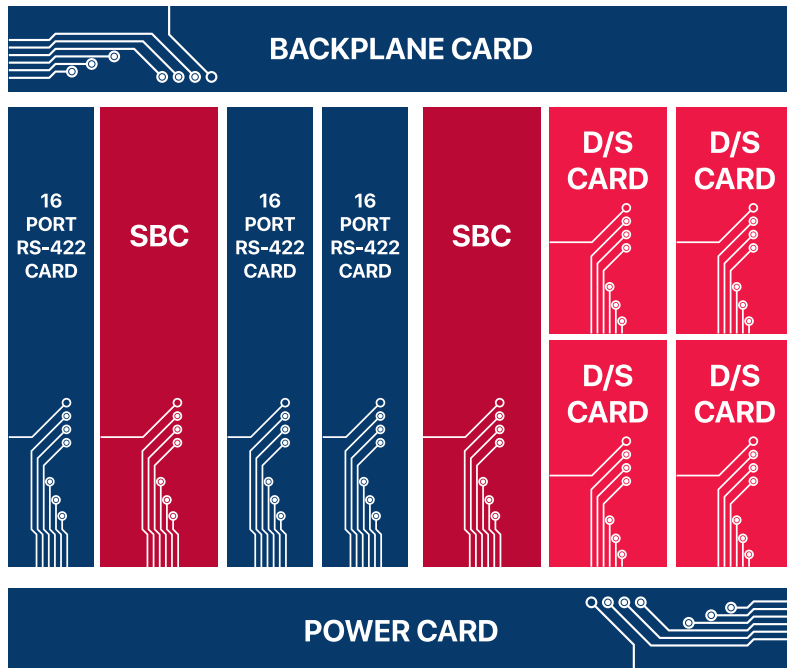
STANDARDS AND CERTIFICATIONS

- ▶ MIL-STD-461F
- ▶ CE102, CS101
- ▶ RE101, RE102
- ▶ RS101, RS103



6U Compact PCI Serial Computer

The 6U Compact PCI Serial Computer is versatile and can be utilized for various applications. The main control card of the structure is a "Single Board Computer". If desired, this card can be expanded with an XMC slot, along with interface development cards such as a Time Card and an Ethernet Card. Additionally, by adding two 16 Port RS-422 cards alongside this card, it can be provided with a 32-port RS-422 interface. With the use of a backplane inside the structure, an additional set of the same configuration can be inserted, enabling a redundancy concept within a single subrack. Moreover, the system allows for the integration of up to four 3U Digital to Synchro or Synchro to Digital conversion cards, offering up to 8 channels for Synchro interface control.





VME64X Single Board Computer Card

VME64X Single Board Computer Card is a high-performance VME 64/VME 64x standard single-board computer (SBC) designed for demanding networking, computing, and control applications. Powered by the Intel Atom X6425E processor operating up to 3.0 GHz with turbo boost, it provides robust processing capabilities complemented by 16GB LPDDR4 RAM and expandable storage up to 500GB. The board features rich connectivity options including 10 Gigabit Ethernet ports, PCIe Gen2 XMC expansion, RS-422 serial interfaces, USB 3.1, HDMI 2.1b output, and mSATA support. Compliant with MIL-STD-461F standards and designed for industrial-grade reliability, it is ideal for mission-critical embedded systems.

TECHNICAL INFORMATION

- ▶ VME 64 and VME 64x form factor standard
- ▶ Intel Atom X6425E processor (2.0 GHz base, 3.0 GHz Turbo)
- ▶ 16GB LPDDR4 RAM
- ▶ 64GB onboard storage + 500GB expandable system storage
- ▶ Networking Interfaces:
 - ▶ 10 x Gigabit Ethernet ports
 - ▶ 2 x Gigabit Ethernet ports on VME P0 connector
- ▶ Expansion Interfaces:
 - ▶ 1 x PCIe Gen2 XMC (1x4 lane)
 - ▶ 1 x mSATA port (6 Gbps)
- ▶ Additional Interfaces:
 - ▶ 2 x RS-422 ports
 - ▶ 2 x USB 3.1 Gen1 ports
 - ▶ 1 x HDMI 2.1b port
- ▶ Power Consumption:
 - ▶ 12W @ 5V
 - ▶ 12W @ 12V

ENVIRONMENTAL CONDITIONS

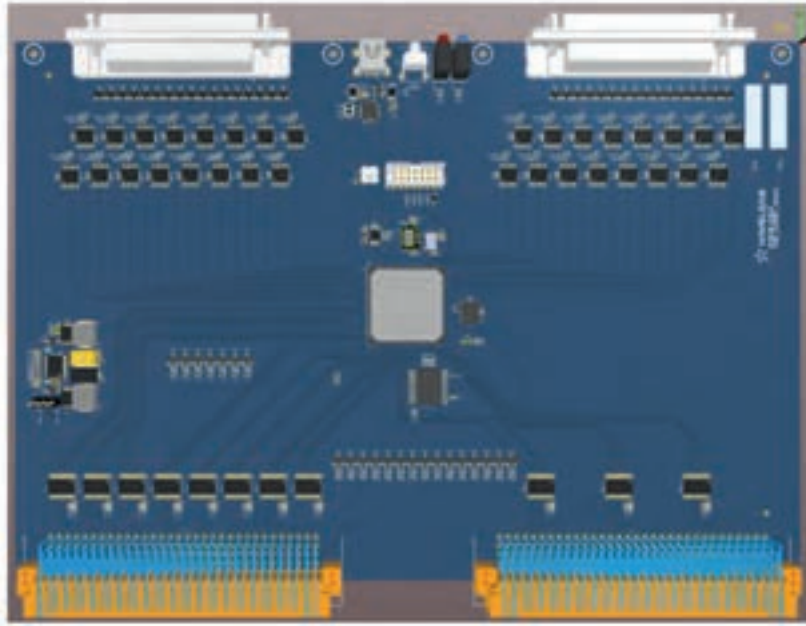
- ▶ Operating temperature range: 0°C to +60°C

MECHANICAL PROPERTIES

- ▶ Board dimensions: 233mm x 160mm x 40.64mm
- ▶ Weight: 200g

STANDARDS AND CERTIFICATIONS

- ▶ MIL-STD-461F
- ▶ CE102, CS101
- ▶ RE101, RE102
- ▶ RS101, RS103



VME64X 32 Port IO Card

VME64X 32 Port IO Card is a VME64x/32x compliant serial communication card designed for high-density RS-422 connectivity in embedded systems. Featuring 32 independent RS-422 ports and a USB debug port for system monitoring and diagnostics, it offers reliable and efficient serial data transmission. Operating with a 5V DC input and housed in a VME-standard form factor, this board is optimized for industrial and embedded applications that require robust and scalable communication interfaces.

TECHNICAL INFORMATION

- ▶ VME64x/32x form factor
- ▶ 32-port RS-422 serial communication interface
- ▶ USB debug port for monitoring and diagnostics
- ▶ Input voltage: 5V DC

ENVIRONMENTAL CONDITIONS

- ▶ Operating temperature range: 0°C to +70°C

MECHANICAL PROPERTIES

- ▶ Board dimensions: 233.35mm x 160mm



DC Surge Protector Card

The protection module is designed to safeguard the power supply lines and external circuits against overvoltage conditions such as surges, lightning strikes, and transient events. By positioning the protection circuitry between the cabin supply connector and the grid voltage source, the board effectively isolates and shields sensitive systems from voltage spikes and disturbances. It integrates configurable cutoff voltage and timing settings, reverse polarity protection, overcurrent protection, and an EMI filter to enhance overall system EMI/EMC performance. Optimized for DC voltage applications, the board is compliant with MIL-STD-461F standards, ensuring reliable operation in harsh electromagnetic environments.

TECHNICAL INFORMATION

- ▶ Protects submarine systems against various AC or DC faults up to 500VDC voltage levels.
- ▶ Provides comprehensive solutions to address all potential issues arising from shoreline power supplies, ensuring uninterrupted operation in challenging conditions.
- ▶ Enhances the safety and reliability of underwater systems, minimizing risk and boosting performance in marine environments.
- ▶ Capable of handling any electrical disturbances, safeguarding critical operations beneath the surface.

MECHANICAL PROPERTIES

- ▶ Board dimensions: 302mm x 150mm

STANDARDS AND CERTIFICATIONS

- ▶ MIL-STD-461F
- ▶ CE102, CS101
- ▶ RE101, RE102
- ▶ RS101, RS103



SOM ZYNQ ULTRASCALE

The SOM Zynq Ultrascale includes 4GB PS DDR4 and 1GB PL DDR4 SDRAM. It supports high-speed interfaces like SATA3.0, USB3.0, and PCIe Gen2 through its PS GTR transceivers. Key components include dual QSPI Flash, eMMC Flash (8GB), Gigabit Ethernet PHY, and 152 user PL I/O pins, offering extensive connectivity and configuration options.

TECHNICAL INFORMATION

- ▶ Xilinx XCZU7EV-1FBVB900 device (supports XCZU4EV, XCZU5EV, XCZU4EG, XCZU5EG, or XCZU7EG devices within the FBVB900 package)
- ▶ 4GB PS-side DDR4 SDRAM (x64 configuration)
- ▶ 1GB PL-side DDR4 SDRAM (x16 configuration)
- ▶ 300 MHz LVDS system clock
- ▶ Dual QSPI Flash memory (64MB)
- ▶ I²C EEPROM (2Kb)
- ▶ eMMC Flash memory (8GB, x8 configuration)
- ▶ USB 2.0 ULPI PHY interface for eMMC
- ▶ Gigabit Ethernet PHY
- ▶ 152 user-accessible PL I/O pins
- ▶ 26 user-accessible PS MIO pins (one full MIO bank)
- ▶ 4 PS GTR transceivers supporting SATA 3.0, USB 3.0, PCIe Gen2, and DisplayPort interfaces
- ▶ 4 PS GTR reference clock inputs
- ▶ 16 PL GTH high-speed transceivers
- ▶ 8 PL GTH reference clock inputs
- ▶ USB 2.0 connector interface
- ▶ PMBus interface for power management
- ▶ Carrier Card I²C interface
- ▶ SOM PS VBATT battery input
- ▶ Power Good output, input voltage monitoring, and output sensing pins
- ▶ SOM reset input, carrier card reset output, and carrier card interrupt input
- ▶ Power-On-Reset (POR) circuit
- ▶ PS JTAG and PL SYSMON interfaces

ENVIRONMENTAL CONDITIONS

- ▶ Designed for industrial operating conditions (specific temperature range not provided in current data)

MECHANICAL PROPERTIES

- ▶ Form factor: System-On-Module (SOM)
- ▶ Board connections through carrier card
- ▶ Compact and rugged design for embedded applications

STANDARDS AND CERTIFICATIONS

- ▶ MIL-STD-461F
- ▶ CE102, CS101
- ▶ RE101, RE102
- ▶ RS101, RS103

CONSOLS AND CABINETS

MFC-100D
MFC-100S
CF-100 CABINET





MFC-100D

GENERAL FEATURES

The MFC-100D Console, includes hardware and software interfaces, utilizing these interfaces to execute guided missile fire control operations. To collect platform, time and environmental data, it is connected to the platform data distribution system. Can be tailored in accordance with customer requirements.

TECHNICAL SPECIFICATIONS

- ▶ Local Guided Missile Fire Control Console
- ▶ Integrated High Performance Computer
- ▶ 27" Display
- ▶ 4K2K UHD PCAP Defence Display (3840 x 2160) Native Resolution
- ▶ PCAP multi-touch Screen
- ▶ 400.0 Nits
- ▶ Qwerty Keyboard
- ▶ Trackball with 3 Buttons
- ▶ Hand-operated Joystick Control Unit
- ▶ 6x 10/100/1000 D38999 Ethernet Ports
- ▶ 2x USB 2.0 Ports
- ▶ Maintenance RJ45 Ethernet Port
- ▶ Remote Control Unit
- ▶ Input Voltage: 115 VAC 60 Hz
- ▶ Operating Temperature: 0°C - 45°C
- ▶ Storage Temperature: -40°C - 70°C
- ▶ Shock: 30g, 11ms
- ▶ Acoustic Noise max 60 dB (A)
- ▶ Dimension: 1650 x 860 x 845 mm (W x H x D)
- ▶ Weight: 190 kg
- ▶ Material: Aluminium

ENVIRONMENTAL CONDITION TESTS

- ▶ MIL-STD-810H
- ▶ MIL-STD-464
- ▶ MIL-STD-461F
- ▶ MIL-STD-1472F
- ▶ IEC EN60529 IPX4
- ▶ IEC EN 60950
- ▶ STL-TD-24



MFC-100S

GENERAL FEATURES

MFC-100S Console includes hardware and software interfaces, utilizing these interfaces to execute guided capsule missile fire control operations. It comprises various hardware and software components. To collect platform, time and environmental data, it is connected to the platform data distribution system. Can be tailored in accordance with customer requirements.

TECHNICAL SPECIFICATIONS

- ▶ Local Guided Missile Fire Control Console
- ▶ Integrated High Performance Computer
- ▶ 21.3" Display
- ▶ PCAP Defence Display (1600 x 1200) Resolution
- ▶ PCAP multi-touch Screen
- ▶ 1000.0 Nits
- ▶ Qwerty Keyboard
- ▶ Trackball with 3 Buttons
- ▶ 6x 10/100/1000 D38999 Ethernet Ports
- ▶ 2x USB 2.0 Ports
- ▶ Maintenance RJ45 Ethernet Port
- ▶ Remote Control Unit
- ▶ Operating Temperature : 0°C - 45°C
- ▶ Storage Temperature :-40°C - 70°C
- ▶ Shock: 30g, 11ms)
- ▶ Acoustic Noise max 60 dB (A)
- ▶ Dimension: 700mm x 600mm x 650mm (W x H x D)
- ▶ Weight: 100 kg
- ▶ Material: Aluminium

ENVIRONMENTAL CONDITION TESTS

- ▶ MIL-STD-810H
- ▶ MIL-STD-464
- ▶ MIL-STD-461F
- ▶ MIL-STD-1472F
- ▶ IEC EN60529 IPX4
- ▶ IEC EN 60950
- ▶ STL-TD-24



CF-100 CABINET

GENERAL FEATURES

- ▶ 13 U device height
- ▶ Standard 19" rack compatibility
- ▶ Ventilation filters for cooling and airflow
- ▶ Removable side panels
- ▶ Arrangements suitable for cable management
- ▶ Modular structure
- ▶ Locking cover mechanism
- ▶ 6 shock isolators (4 on the base, 2 on the rear cover)
- ▶ 4 carrying handles

TECHNICAL SPECIFICATIONS

- ▶ Dimensions: 800 X 600 X 600 mm
- ▶ Weight: 120 kg
- ▶ Material: Aluminum

ENVIRONMENTAL CONDITION TESTS

- ▶ MIL-STD-810F
- ▶ MIL-STD-1474D
- ▶ MIL-STD-461E
- ▶ MIL-STD-1310
- ▶ IEC EN60529 IP23
- ▶ IEC EN 60950
- ▶ IEC-61000-4-5

MILITARY RUGGED PANEL COMPUTERS

DEFENCE TYPE PANEL COMPUTER 12.1"
DEFENCE TYPE PANEL COMPUTER 15"





DEFENCE TYPE PANEL COMPUTER 12.1"

GENERAL FEATURES

- ▶ Defence Type Panel Computer Unit for marine and submarine platforms
- ▶ 12.1" PCAP Touch Screen
- ▶ LED illuminated, 12.1" 1024x768 XGA TFT-LCD Screen
- ▶ Sunlight Readable
- ▶ Skylake-H Intel® Core™ i5-6442EQ quad core processor with 1.9GHz up to 2.7GHz
- ▶ 8 GB DDR4-SODIMM-2400 ECC RAM
- ▶ 128 GB mSATA SSD
- ▶ 2 x Gbit Ethernet
- ▶ 1 x USB
- ▶ Power: 115VAC 60Hz, <60W
- ▶ Dimensions: 380x246x186 (GxDxY)
- ▶ Military Power and Ethernet connectors
- ▶ Optional Serial Interface Type RS-232/485/422
- ▶ Optional Video Input Options S-VIDEO, HDMI, HD-SDI
- ▶ Optional Data ARINC429, MIL-STD-1553

ENVIRONMENTAL CONDITIONS (APPROVED)

- ▶ Mil-Std-461E (CE101, CE102, CS101, CS114, CS116, CS116, RE101, RE102, RS101, RS103) EMC/EMI approved
- ▶ Mil-Std-1399 Section 070 DC
- ▶ IEC-61000-4-5 2kV 1.2/50us
- ▶ Mil-Std-810F Method 507.4
- ▶ Mil-Std-810F, Method 516.5 22g, 20ms
- ▶ Operating Temperature: 0°C to 45°C
- ▶ Storage Temperature: -20°C to 70°C
- ▶ Process pressure: 800-1400hPa
- ▶ IEC EN60529 IP23



DEFENCE TYPE PANEL COMPUTER 15"

GENERAL FEATURES

- ▶ Defence Type Panel Computer Unit for marine and submarine platforms
- ▶ 15" PCAP Touch Screen
- ▶ LED illuminated 15" 1024x768 XGA TFT-LCD Screen
- ▶ Sunlight Readable
- ▶ Skylake-H Intel® Core™ i5-6442EQ quad core processor with 1.9GHz up to 2.7GHz
- ▶ 8 GB DDR4-SODIMM-2400 ECC RAM
- ▶ 128 GB mSATA SSD
- ▶ 2 x Gbit Ethernet
- ▶ S-Video input
- ▶ 2 x USB
- ▶ Power: 220VDC, <70W
- ▶ Dimensions: 361x376x124 (GxDxY)
- ▶ Military Power and Ethernet connectors
- ▶ Optional Serial Interface Type RS-232/485/422
- ▶ Optional Video Input Options S-VIDEO, HDMI, HD-SDI
- ▶ Optional Data ARINC429, MIL-STD-1553

ENVIRONMENTAL CONDITIONS (APPROVED)

- ▶ Mil-Std-461E (CE101, CE102, CS101, CS114, CS116, CS116, RE101, RE102, RS101, RS103) EMC/EMI approved
- ▶ Mil-Std-1399 Section 070 DC
- ▶ IEC-61000-4-5 2kV 1.2/50us
- ▶ Mil-Std-810F Method 507.4
- ▶ Mil-Std-810F, Method 516.5 22g, 20ms
- ▶ Operating Temperature: 0°C to 45°C
- ▶ Storage Temperature: -20°C to 70°C
- ▶ Process pressure: 800-1400hPa
- ▶ IEC EN60529 IP23

POSITION TIME AND FREQUENCY SOLUTIONS

TIME MASTER
ANTENNA DISTRIBUTION UNIT (ADU)
GNSS RECEIVER
KASK – GNSS PROTECTION SYSTEM
TIMEN ANALOG-DIGITAL NTP CLOCK





TIME MASTER

HAVELSAN's Time Master is a versatile and adaptable system designed to synchronize essential military and commercial infrastructures with the utmost reliability and security. Count on our Time Server to deliver the dependable and secure time synchronization necessary to uphold operational excellence.

GENERAL FEATURES

- ▶ Generating of Atomic clock disciplined time data
- ▶ Generating of GNSS disciplined time data
- ▶ Configurable time interfaces
- ▶ Web based configuration interface
- ▶ Multi-GNSS configurations (GPS, Galileo, GLONASS, BeiDou)

APPLICATION FIELDS

Military Applications

- ▶ Air, Land, Underwater and Surface Platforms
- ▶ Data Distribution Systems
- ▶ Navigation Systems
- ▶ Tactical Data Links
- ▶ Communication Systems
- ▶ Autonomous Sensor Networks

Commercial Applications

- ▶ Financial Services
- ▶ Telecommunications
- ▶ Healthcare
- ▶ Transportation and Logistics
- ▶ Energy Sector
- ▶ Manufacturing and Automation
- ▶ Data Centers

POWER

- ▶ 12-36 VDC and 100-240 VAC input

DIMENSIONS

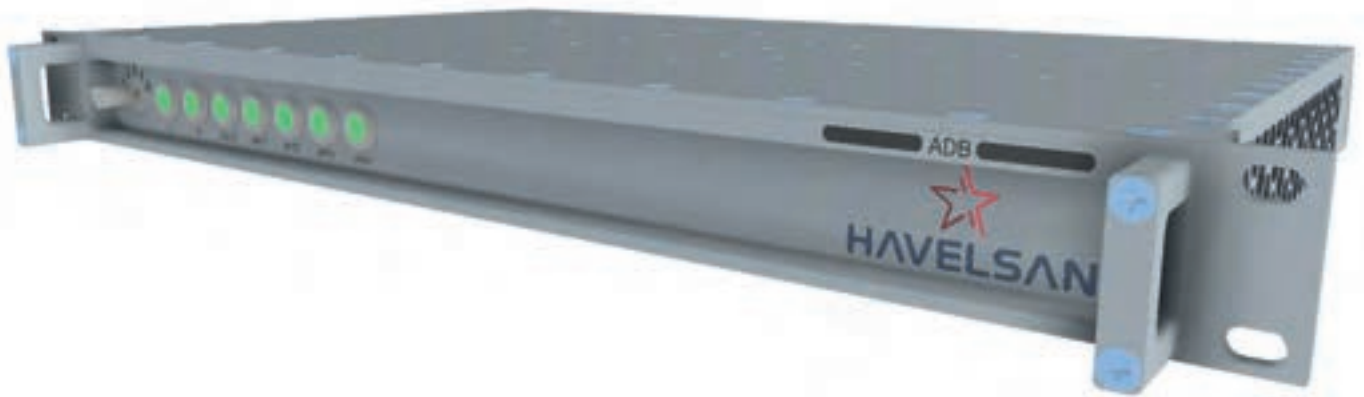
- ▶ 16.75"W x 1.72"H x 14.33"D (EIA-310-D 19 compatible)

OPTIONAL TIME SOURCES

- ▶ Rubidium OSC
- ▶ CSAC (Chip-Scale Atomic Clock)
- ▶ TCXO (Temperature Compensated Crystal Oscillator)

INTERFACES

- ▶ 2x RS422 Havequick+1PPS input
STANAG and ICD-GPS-60A compatible
- ▶ 2x configurable IRIG output
DCLS/AM selectable, RS422 and TTL
- ▶ 1x DCLS/AM selectable and configurable IRIG input
DCLS/AM selectable, RS422 and TTL
- ▶ 1x 1PPS output
ICD-GPS-060A compatible
- ▶ 1x 10MHz TTL output
- ▶ 5 ports NTP/PTP selectable GbE
- ▶ GNSS receiver and configurable navigation data distribution
NMEA, RINEX, ICD-GPS-153



ANTENNA DISTRIBUTION UNIT (ADU)

HAVELSAN ADU is a unit designed to switch between multiple antennas, either automatically or through user selection, to receive signals from global positioning satellites and distribute them to the systems requiring them across various platforms.

GENERAL FEATURES

- ▶ 1U / 2U Size
- ▶ 4 Inputs / 6 Outputs or 6 Inputs / 8 Outputs
- ▶ +5V/12V Bias Blocks Support
- ▶ Antenna Signal Strength
- ▶ Redundant RS-422 Control/Monitoring Interface
- ▶ Discrete Control Interface
- ▶ Channel Selection Switch
- ▶ Signal Status Indicator
- ▶ Redundant Power Input
- ▶ Input Voltage: 10-36VDC
- ▶ Power Consumption: <30W
- ▶ Out-of-Band Signal Filtering (ADU excludes signals within the 950-2200 MHz range).
- ▶ 4 Inputs / 6 Outputs and 6 Inputs / 8 Outputs, providing flexibility to meet varying operational requirements.
- ▶ Wide Input Range Capability (ADU supports a wide input range capability).
- ▶ Support for GNSS Bands
 - GPS
 - L1C/A (1575.42 MHz)
 - L2C(1227.60MHz)
 - GLONASS
 - L1OF (1602 MHz)
 - L2OF (1246 MHz)
 - QZSS
 - L1C/A (1575.42 MHz)
 - L2C (1227.60 MHz)
 - Galileo
 - E1-B/C (1575.42 MHz)
 - E5b (1207.14 MHz)
 - BeiDou
 - B1I (1561.098 MHz)
 - B2I (1207.140 MHz)
 - SBAS
 - L1C/A
- ▶ Self-Calibration Capability and Automatic Gain Mode
 - Automatic selection of the antenna mast with the strongest signal level and the ability to configure the input signal through its integrated RF blocks.
- ▶ Antenna Signal Strength Measurement
 - ADU enables precise measurement of antenna signal strength to ensure optimal performance and signal quality.

APPLICATION FIELDS

- ▶ Defense and Military Applications, Telecommunications and Broadcasting

COMPARISON CHART

	Inputs	Outputs	Gain	Dimensions	Interface	Operating Temperature
HAVELSAN Option - 1	4	6	Adjustible ±60 dB	1U	Discrete 2x RS-422	-40~ +60°C
HAVELSAN Option - 2	6	8	Adjustible ±60 dB	2U	Discrete 2x RS-422	-40~ +60°C



GNSS RECEIVER

HAVELSAN GNSS (Global Navigation Satellite System) Receiver plays a crucial role across a broad spectrum of both military and commercial fields, combining reliability and success. Our product provides users with a reliable positioning experience across various sectors and serves as a critical tool in navigation systems.

INTERFACES

- ▶ Configurable RS422 Serial I/O (up to 8)
- ▶ NMEA up to version 4.11 and/or Proprietary (ASCII, configurable messages GGA, GGL, GSA, GSV, RMC, VTG, TXT, etc.)
- ▶ STANAG HQ output
- ▶ 1PPS output (ICD-GPS-060A compatible)
- ▶ GPS-ICD-153
- ▶ 5" TFT Touchscreen

CONNECTORS

- ▶ Antenna Connector: SMA Type Socket
- ▶ Power Connector: MS Series 3 pole
- ▶ Data Connector: MS Series 22 pole

STATUS LEDS

- ▶ Power LED
- ▶ 1 PPS LED

START TIME

- ▶ Approx. 2 minutes with internal battery (Hot Start)

DIMENSIONS

- ▶ 160 mm x 240 mm x 75 mm (WxLxH)

WEIGHT

- ▶ 1.5 kg

POWER CONSUMPTION

- ▶ 9-36VDC, <10W

SATELLITE TRACKING

- | | |
|--|---|
| ▶ GPS
L1C/A (1575.42 MHz)
L2C (1227.60 MHz) | ▶ BeiDou
B1I (1561.098 MHz)
B2I (1207.140 MHz) |
| ▶ GLONASS
L1OF (1602 MHz)
L2OF (1246 MHz) | ▶ QZSS
L1C/A (1575.42 MHz)
L2C (1227.60 MHz) |
| ▶ Galileo
E1-B/C (1575.42 MHz)
E5b (1207.140 MHz) | ▶ SBAS
L1C/A |

HORIZONTAL POSITION ACCURACY

- ▶ PVT 1.5 m CEP (in different GNSS modes)
- ▶ SBAS 1.0 m CEP (in different GNSS modes)
- ▶ RTK 0.01 m + 1 ppm CEP (in different GNSS modes)

NAVIGATION UPDATE RATE

- ▶ GPS+GLO+GAL+BDS / GPS+GLO+GAL 1 Hz

HEADING ACCURACY

- ▶ 0.4 deg



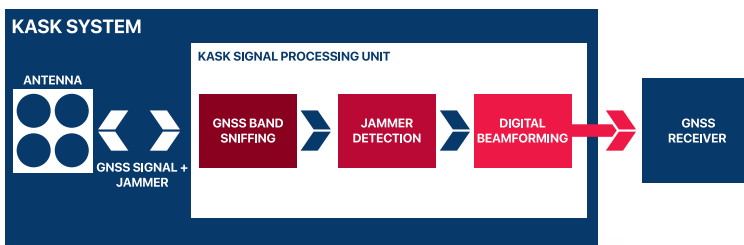
KASK – GNSS PROTECTION SYSTEM

HAVELSAN KASK (Continuous Protection Under Jamming) GNSS Protection System is designed for all software and algorithms that enable GNSS systems to operate effectively under jamming conditions. The system ensures the precise analysis of satellite signals and the accurate generation of position information, and detects the direction of GNSS jamming signals in real-time.

KASK – GNSS Protection System

- ▶ Over 40 dB of jamming suppression against jammers
- ▶ Protection against different types of jammers (narrowband, broadband and pulse type)
- ▶ Forming 3 simultaneous nulling in different directions
- ▶ Jammers direction detection
- ▶ Fast adaptation to dynamic multi-jammer environments
- ▶ Jammer type information
- ▶ High sensitivity internal GNSS receiver
- ▶ Easy integration to military and civil platforms, UAV, IGA, armored vehicles
- ▶ Recording of jamming information (position, time, jammer type) and display on the map in real time
- ▶ Post-mission jammer analysis and playing on the map of the jammer information recorded during the mission
- ▶ RS422/Ethernet interface (for GPS NMEA output)
- ▶ Ergonomic Signal Processing unit and Antenna

KASK can be used on all mission-critical platforms where GNSS systems are subjected to interference



KASK system is capable of detecting the presence of jammer and suppressing the jammer by creating different digital nulling in different directions



- ▶ User-Friendly Graphical Interface
- ▶ ESM/SIGINT Module; signal type analysis and signal direction information monitoring on real time
- ▶ Post-mission jammer analysis and re-playing on the map with exact jammer positions



TIMEN ANALOG-DIGITAL NTP CLOCK

GENERAL DESCRIPTION

The TIMEN NTP Clock Series provides accurate time referencing from an NTP server over Ethernet. It offers a cost-effective solution for displaying synchronized time across multiple platforms or premises. Both analog and digital models ensure fast, reliable synchronization and can be easily configured through TIMEN Software. The analog model features traditional hour, minute, and second hands with fast adjustment capability via independent step motors, while the digital model offers high-visibility numeric displays, color options, and adjustable brightness for enhanced flexibility.

HIGHLIGHTED FEATURES

- ▶ NTP and SNTP support
- ▶ DHCP and Static IP option
- ▶ Telnet protocol support
- ▶ SNMP support
- ▶ Easy configuration via TIMEN Software
- ▶ Saving time information by Real-Time Clock (RTC) with battery
- ▶ Daylight saving time support
- ▶ Password protection and password change option
- ▶ NTP server connection monitoring (LED indication)
- ▶ NTP server connection mode selection (Query, Broadcast)
- ▶ IP address assignment for NTP server (Primary, Secondary)
- ▶ Data receive period assignment (5–999 seconds)
- ▶ Time zone selection (-12 to +12)
- ▶ Factory settings reset function
- ▶ Monitoring initial zeros (for digital model only)
- ▶ Adjustable brightness 0–100% (for digital model only)

ANALOG-SPECIFIC FEATURES

- ▶ Clock face with 12-hour format
- ▶ Independent fast adjustment by three step motors
- ▶ Background design alternatives
- ▶ Hour, minute, and second hand display

DIGITAL-SPECIFIC FEATURES

- ▶ 6-digit, 58mm and 102mm character height options
- ▶ Visibility up to 30 meters (D058) or 50 meters (D102)
- ▶ LED color option (default: red)
- ▶ Time or date monitoring
- ▶ Automatic selection of time or date displaying

CONNECTORS

- ▶ Ethernet RJ45
- ▶ IEC 320 AC connector

POWER

- ▶ Analog Clock: IEC AC 110–220V, 50/60Hz
- ▶ Digital Clock: PoE (IEEE802.3af) or DC (24VDC)
IEC AC 110–220V, 50/60Hz
Power consumption: <15W (Digital)

OPERATING PARAMETERS

- ▶ Operating temperature range: 0°C to +60°C
- ▶ Storage temperature range: -20°C to +85°C
- ▶ Humidity: 90% (non-condensed)

PHYSICAL SPECIFICATIONS

- ▶ Analog Clock:
Material: Lampblack body
Protection Rating: IP40
Dimensions: Ø330mm x 75mm (Diameter x Depth)
- ▶ Digital Clock:
Material: Lampblack body
Protection Rating: IP40
D058 Model Dimensions: 350mm x 60mm x 95mm (L x W x H)
D102 Model Dimensions: 668mm x 60mm x 150mm (L x W x H)

WEIGHT:

- ▶ Analog Clock: Not specified
- ▶ Digital Clock:
1.80kg (D058)
3.61kg (D102)



HAVELSAN



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HAVELSANResmi



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