Smart210: Advanced Integrated Avionics System for New Generation Trainer

The avionics system designed by the pilot.
Smart210: Advanced Integrated Avionics System for New Generation Trainer

Smart 210 Advanced Integrated Avionics System for New Generation Trainer is designed by pilot, which fulfills the training requirements of the new generation flight. Smart 210 is developed with multi-redundancy architecture and military standards to satisfy the high safety requirements and the high reliability in severe environment requirements. The standard package of Smart 210 includes these function modules: Smart DU, HUD, DIU, COMM, NAV (DME, VOR, ADF, ILS), XPDR, VMS, INS/GNSS, ADS-B, HOTAS, FDR and etc. These function modules can be combined according to customers’ need and budget. And with the permission of the government, Smart 210 can also provide military modules such as fire control system, optronics pod, datalink, autopilot, radar pod, weapon bracket and etc. And night vision is also supported. Besides, Smart 210 can be used for the update and modification of the commissioned turboprop and jet trainers or ground attack aircrafts.

System Architecture
System Composition

- Display control function: PFD function with synthetic vision function, customizable mobile map, HUD and backup instrument functions;
- Communication navigation function: provision of navigation information, e.g. VHF voice communication, GPS navigation, air data navigation, attitude, ILS, VOR, DME, RA, etc;
- Sensor surveillance alarm: XPDR function, TAWS function, WXR function, RADAR function, EVS function, FLIR function, IFF function;
- Data conversion: data format conversion of A429, RS422, RS232 and Ethernet data to realize the data interaction between different data interface devices;
- Automatic flight servo control: autopilot control function;
- Turning Control Panel(TCP): frequency tuning, mode control and status indication functions of communication navigation, etc.;
- Audio Control Panel(ACP): control of audio information and volume adjustment of communication system and navigation system, etc;
- Weapon system: reserved interface, scalability of fire control system and load management functions.

Features

- 20”*8” dual-redundancy touch screen, fulfills the training requirements of the latest 4th generation fighters;
- Westernized POP design , compliance with FAA&EASA regulation.
- With ARINC424 navigation database, updated every 28 days;
- With drag-and-drop intelligent route planning, more efficient route planning;
- With intelligent checklist, simplify operation procedure and promote flight safety;
- With embedded fault system and weapon simulation system, fulfill the comprehensive training requirements;
- With 3D flight teaching evaluation system, more efficient flight training and higher flight training qualification rate;
- Software modules: PFD, ND, EICAS, MovingMap (VFR, Low-IFR, High-IFR, Approach Chat), SVS, FMS, Radio Turn. Military applications such as Weapon Management, Field Situation Awareness, Sensor Fusion, Fire-control Radar and etc. will be provided with the permission of government.
Avionics Products

DU-XV-01 Integrated Display Control Unit (DU)

Product Information of Integrated Display Control Unit (DU)

**Functions**
- **Primary Flight Display Unit (PFD)**
  1. Attitude Director Indicator (ADI);
  2. Barometric Altitude Indicator;
  3. Air Speed Indicator (ASI);
  4. Vertical Speed Indicator (VSI);
  5. Horizontal Situation Indicator (HSI);
  6. Course Deviation Indicator (CDI);
  7. Heading & Glide Slope Indicator (LOC&GS);
  8. Synthetic Vision System (SVS);
  9. 3D Terrain Awareness Warning System (3D-TAWS).
- **Utili-function display unit (MFD)**
  1. Electronic checklist;
  2. Engine parameter display;
  3. Flight plan management;
  4. Flight map (departure/approach, airspace, aeronautical chart, etc.);
  5. Unit alarm;
  6. One-key toggle display (Six-Pack).
- **Tuning control panel (TCP)**
  1. Display of current frequency and status;
  2. Radio frequency tuning;
  3. Standby frequency activation;
  4. Mode control.

**Standards**
- Minimum Performance Standard for Airborne Multipurpose Electronic Displays (SEA AS8034);
- General Requirements for Ergonomic Design of Military Visual Displays (GJB 1062A-2008);

DU-XV-210 Data Interface Unit (DIU)

Product Information of Data Interface Unit (DIU)

**Functions**
- 1) 20-channel ARINC429 signal processing capacity;
- 2) 10-channel Ethernet signal processing capacity;
- 3) 20-channel RS422/RS232 signal processing capacity;
- 4) 20-channel I/O signal processing capacity;
- 5) 10-channel analog signal processing capacity;
- 6) 5-channel CAN signal processing capacity.

**Standards**
- Airborne Equipment- Environmental Conditions and Test Procedures (RTCA/DO-160G).

HUD-XV-210 Head-Up Display Unit (HUD)

Product Information of Head-up Display Unit (HUD)

**Functions**
- 1) Speed indicator (indicated airspeed, true airspeed, Mach number, ground speed, target speed, vertical speed);
- 2) Altitude indicator (barometric altitude, radar altitude, target altitude);
- 3) Attitude indicator (course angle, angle of pitch, roll range, angle of attack, angle of sideslip, track, FPV speed vector);
- 4) Warning information (resistance to scratch tail, recovery from abnormal attitude, avoidance of conflict);
- 5) Approach gliding indicator (glide path deviation indicator, orientation deviation indicator);
- 6) Mode control and switching;
- 7) Front camera function;
- 8) Video output function for record.

**Standards**
- Minimum Performance Standard for Airborne Head Up Display (HUD) (SAE AS 8055-1999);
- Airborne Equipment- Environmental Conditions and Test Procedures (RTCA/DO-160G).
**INI-XV-210 Integrated Navigation System (INS/GNSS)**

**Product Information of Integrated Navigation System (INS/GNSS)**

**Functions**
1) **Attitude heading measurement**: angle of pitch, roll angle, heading, angular rate, acceleration, speed, position;
2) **Satellite positioning measurement**: UTC, position, speed;
3) **Dual redundancy architecture**.

**Standards**
- Minimum Performance Standard for Tilt Pitch Instrument (SAE AS8001);
- Minimum Performance Standard for Gyro Stability Magnetic Heading Device (SAE AS8031A);
- Minimum Performance Standard for Turn & Sideslip Indicator (SAE AS8004);
- Airborne Equipment- Environmental Conditions and Test Procedures (RTCA/DO-160G).

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**IRE-XV-210 Communication Navigation System (CNS)**

**Product Information of Communication Navigation System (CNS)**

**Functions**
1) **VHF two-way voice communication function**;
2) **VHF emergency communication function**;
3) **ILS navigation function (LOC, GS, MB)**;
4) **VOR navigation function**;
5) **ADF navigation function**;
6) **DME navigation function**;
7) **RA altitude measurement function**;
8) **AFT response function (mode S)**;
9) **Support ADS-B OUT broadcasting function**;
10) **ACP audio processing and control function**.

**Standards**
- Minimum Performance Standard for VOR Radio Receiving Equipment with Working Range of 108–117.95MHz (DO-196);
- Minimum Performance Standard for ILS Course Beacon Receiving Equipment with Working Range of 108–112MHz (DO-195);
- Minimum Performance Standard for ILS Gliding Receiving Equipment with Working Range of 328.6–335.4MHz (DO-192);
- Minimum Performance Standard for VHF Radio Communication Transmitting Equipment with Working Range of 117.975–137.00MHz (DO-186B);
- Minimum Performance Standard for Air Traffic Control Radar Beacon System/Mode Selection (ATCRBS/Mode S) Airborne Equipment (DO-181D);
- Minimum Performance Standard for Audio Selection Panel and Amplifier (DO-170);
- Minimum Performance Standard for Beacon Receiving Equipment (DO-143);
- Minimum Working Performance Standard for Radio Altitude Measurement Equipment (DO-103);
- Minimum Working Performance Standard for Radio Distance Measurement Equipment (DO-189);
- Airborne Equipment- Environmental Conditions and Test Procedures (RTCA/DO-160G).

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**Video Monitor System (VMS)**

**Product Information of Video Monitor System (VMS)**

**Functions**
1) **Toggle switch is provided to realize the toggle display of head-up display system output video and front cockpit camera’s output video**;
2) **Operation interface of display brightness control is provided to realize the display brightness control, and support manual and automatic brightness control**;
3) **The avionics system data received are recorded and stored**;
4) **Mass memory can realize the quick plug for the convenience of quickly accessing recorded data**.

**Standards**
- Minimum Performance Standard for Air Data Computer (SAE AS8002a);
- Airborne Equipment- Environmental Conditions and Test Procedures (RTCA/DO-160G).

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**Air Data System (ADS)**

**Product Information of Air Data System (ADS)**

**Functions**
1) **Dual redundancy architecture**;
2) **Air data measurement**: indicated airspeed, true airspeed, total pressure/static pressure, total air temperature/static air temperature, angle of attack, angle of sideslip, Mach number, barometric altitude, vertical speed;
3) **Airspeed head of air data system with pilot’s manual heating function**.

**Standards**
Company Profile

Chengdu Hermes Technology Co., Ltd. is a Chinese government certificated military avionics system manufacturer, which specialized in R&D, manufacturing and service of aeronautic system. Hermes-sys has more than ten years of experience in aviation engineering. Our team consists of elite talents in several fields, e.g. integrated avionics, UAV, imitative measurement and control, flight-test for navigability, electronic engineering, structural mechanics, industrial design and embedded system.

Core business of our company includes Advanced Integrated Avionics System, UAV Ground Control System, Simulator & Simulation Test.

So far, our technology and products have been widely used by aeronautic customers including Aviation Industry Corporation of China (AVIC), Commercial Aircraft Corporation of China (COMAC), China Electronic Technology Corporation (CETC), China State Shipbuilding Corporation (CSSC), China North Industries Group Corporation (NORINCO GROUP), Diamond Aircraft and DOTEC, etc.

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