Report No. 11636

A350-1000F MDCLS

CDP CONFIGURATION ITEM REQUIREMENTS DOCUMENT

|  |  |
| --- | --- |
| Module: |  |
| Configuration Type: |  |
| Configuration: |  |

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# INTRODUCTION

## Scope

The purpose of this document is to capture high level requirements for Cargo Display Panel which is part of the A350-1000F Main Deck Cargo Loading System provided by Ancra. The Airbus A350-1000F Main Deck Cargo Loading System (MDCLS) includes the CPIOM, Common Remote Data Concentrators (cRDC), Power Drive Units (PDU), Control panels (CP) and Cargo Display Panel (CDP).

This document falls at Tier 3 of the requirement hierarchy. Refer the System Development Plan for information on the requirement development process:

Refer to the below figure for CDP CIRD in Requirement Hierarchy

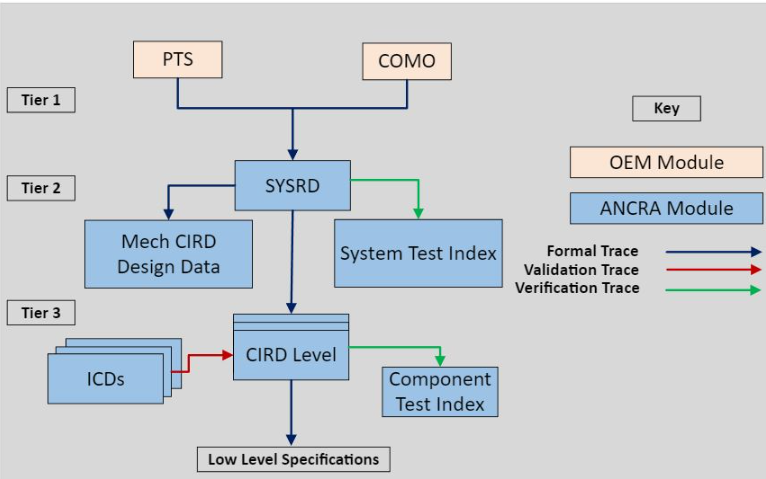


Figure 1 - CDP CIRD in Requirement Hierarchy

## System Overview

The Main Deck Cargo Loading system for the A350-1000F is designed and installed on the main deck cargo loading system will operate in a class E cargo compartment.

The A350-1000F fuselage frame stations and the position of PDUs, CPs and CDP in the cargo compartment and are as in the below indicative figure:

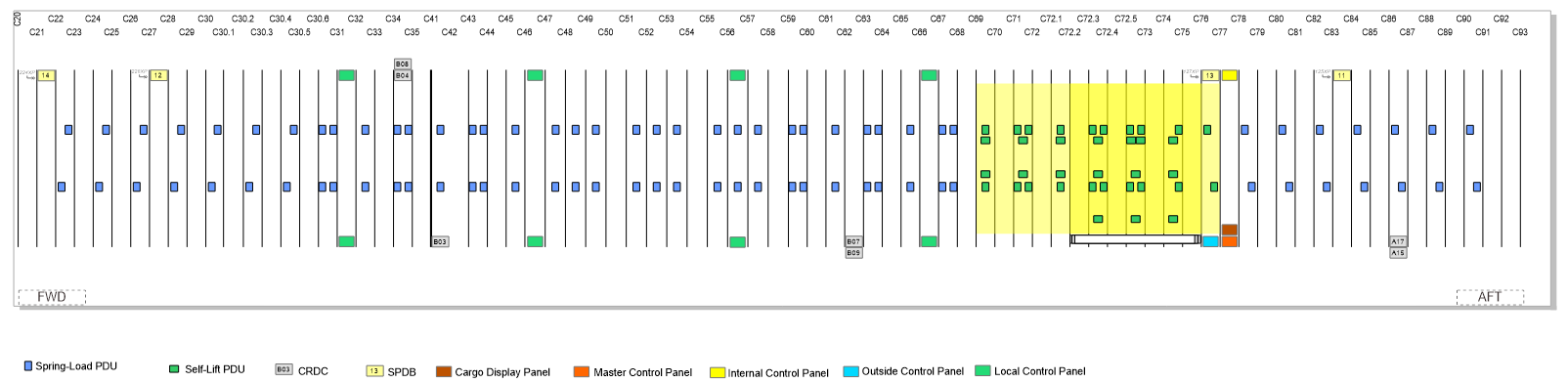


Figure 2 - A350-1000F Cargo Hold Area - Equipment Positions

For the MDCLS three areas will be considered., Door & Extended entrance area, Forward cargo hold area and AFT cargo hold area. Inside the Door & Extended entrance area ULDs will be loaded into (IN) or unloaded out (OUT) of the aircraft. ULDs can be rotated (pallet turning) there. Inside the FWD and the AFT cargo hold area, the ULDs will be transported on the left hand (LH) or right-hand (RH) side. Both sides can be operated separately. For ULDs transported in the middle or on both sides, the operation can be performed either from left hand or from the right-hand side. ULDs will be loaded in or unloaded out of the Cargo Compartment via an external Cargo Loader.

MDCLS will move the ULDs in and out of the aircraft with the help of Power Drive Units (PDUs) based on the commands provided by the operator from the Control Panels (CP), the status of the MDCLS and equipment can be monitored in Cargo Display panel. ULDs will be guided and restraint by mechanical parts. To lock and unlock ULD, the operator must operate latches manually. Thus, the MDCLS will be a semi-automatic system.

The below Figure represents the A350-1000F MDCLS Architecture

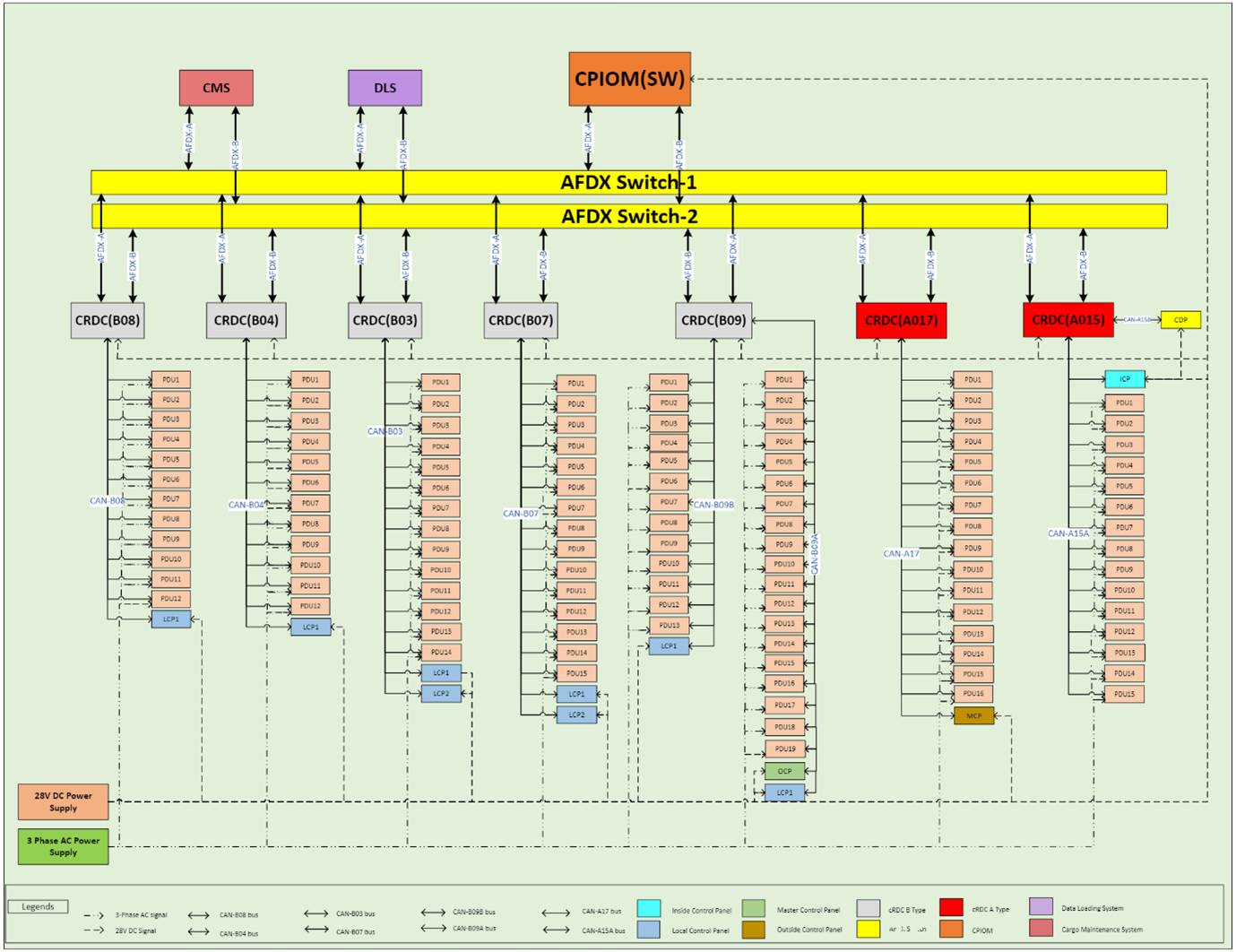


Figure 3 - A350F MDCLS ARCHITECTURE

The key components of the A350-1000F Main Deck Cargo Loading system include:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.NO** | **Equipment/Component** | **MDCLS** | **Qty** | **Supplier** |
| 1 | CPIOM  - MDCLS: Operational Software  - MDCLS: SBITE Software | Internal | 1  1 | Ancra |
| 2 | Common Remote Data Concentrators | Internal | 7 | Airbus |
| 3 | Control Panels (CPs)   * Outside Control Panel - 1 * Master Control Panel - 1 * Inside Control Panel - 1 * Local Control Panel - 6 * Local Control Panel 20FT - 2 | Internal | 11 | Ancra |
| 4 | Cargo Display Panel (CDP) | Internal | 1 | Ancra |
| 5 | Power Drive Units (PDUs)   * Spring Loaded PDUs – 80 * Self-Lift PDUs – 36 | Internal | 116 | Ancra |
| 6 | Secondary Power Distribution Box | Internal | 4 | Airbus |
| 7 | CAN Bus | Internal | 9 | Airbus |
| 8 | AFDX Switch Network | Internal | 2 | Airbus |
| 9 | Data Loading System | External | 1 | Airbus |
| 10 | Centralized Maintenance System | External | 1 | Airbus |
| 11 | SSPC | Internal | 4 | Airbus |

Table - A350F MDCLS Key components

**IMA CPIOM:** The Integrated Modular Avionics (IMA) Core Processing and Input / Output Module (CPIOM) is a high-performance computer capable of supporting multiple Hosted Applications (HAs) of differing Design Assurance Levels (DAL) on one computer.

The MDCLS Control and SBITE HAs will reside on a CPIOM. ANCRA will be supply these Hosted Applications.

The Primary function of the Control application is ULD type detection function, Speed Control Function, PDU(s) drive logic and PDU scrub protection. The Control application communicates with the cRDC’s via AFDX. The cRDC’s communicate with the Control Panels, CDP and PDU’s via CAN Bus. The translation of data from AFDX to CAN Bus and vice versa allows the Control HA to receive control panel commands and direct the various PDU’s in the Cargo Compartment.

In addition, Control application includes following functions:

* CPIOM State determination
* Continuous fault and Monitoring
* AFDX message processing
* Indication functions

The SBITE HA provides Built-in Test and monitoring functions for the MDCLS during system operation.

**Power Drive Unit:** The PDU is responsible for movement of ULD’s in the Freighter to facilitate loading and unloading. A series of Power Drive Units are installed on the Freighter to move the ULD’s laterally and longitudinally in the main deck cargo hold area of the Freighter as needed for the movement of ULDs. There are 2 types of PDUs: Spring Loaded PDU, Self-Lift PDU

The primary functionality of PDU is ULD Detection, ULD Movements laterally/longitudinally and Speed control for softer start and stop control of ULDs. PDU operates on 3 Phase AC power supply from ground power unit and communicates with the external devices on CAN bus.

**Control Panels (CP):** The CP primary function is to perform button/joystick Discrete Signal Processing. The discrete inputs received from joystick/switches are packed and transmitted on CAN bus. The MDCLS contains multiple control panels, the capabilities of control panel near the DOOR are different from control panels placed inside cargo holding area. Control panels are placed at strategic locations for better visibility and access. Below is the list of control panels:

* Outside Control Panel
* Master Control Panel
* Inside Control Panel
* Local Control Panel
* Local Control Panel with 20FT

**Cargo Display Panel (CDP):** The CDP primary function is to indicate the MDCLS status. The system status is received through the CAN bus and will be displayed on 17-inch Touch screen. In Addition, System status displayed in CDP supports Maintenance Features. The Main page offers visualization of the System and provides critical information about the status of the individual components of the System. The Maintenance Page provides more detailed information about the status of the components of the System and allows the Operator to perform troubleshooting operations.

**Common Remote Data Concentrator:** The Primary function of cRDCs is translating and routing of AFDX to CAN messages and vice versa for the MDCLS.  The translation is for data from the Control and BITE HAs in the CPIOM to the Control Panels, PDU’s and the Display Panel / Health Monitoring Display and vice versa.  The cRDC’s also control the flow of +28Vdc and 115V AC power to the PDU’s, Control Panel and Display Panel / Health Monitoring Display.

**Secondary Power Distribution Boxes:** The SPDBs control the flow of +28 Vdc power to the CP, CDP, and LCP’s. The SPDBs also provides 3 phase 115V AC Power to all PDU.

The interfaces used in MDCLS system are as follows:

**CAN:** The CAN protocol is based on the CAN FD / ARINC 825 standards. Controller Area Network bus or CAN bus is utilized to connect the cRDC’s with the various Control Panels (OCP, MCP, ICP and LCP’s). CAN Bus is also utilized to connect the cRDC’s with the PDU’s.

**AFDX:** Avionics Full Duplex Switched Ethernet or AFDX is utilized to connect the MDCLS Hosted Applications located in the CPIOM with the cRDC’s and SPDB’s. AFDX protocol is based on the ARINC 664 / part 7. The redundant design of the AFDX bus structure provides multiple paths for the communication of data to and from the Control HA and the cRDC’s. It also provides multiple paths for the communication of data to and from the BITE HA and cRDC’s and the BITE HA and the Central Maintenance System (CMS).

### Cargo Display Panel Overview

The Main Deck Cargo Loading System (MCDLS) includes a 17” Touch Screen Display called as Cargo Display Panel (CDP) to indicate System Status and support Maintenance Features. The Main page offers visualization of the System and provides information about the status of the individual components of the System. The Maintenance Page provides more detailed information about the status of the components of the System and allows the Operator to perform troubleshooting operations.

The Cargo Display Panel will be installed in the sidewall lining LH-side of the aircraft. CDP receives the LRU status data over a CAN interface. The CDP software reads the CAN messages received in the CAN controller, processes the CAN message, validates it and updates the display with the respective visual indications thereby providing live data of all the operational data for each equipment.

The Cargo Display Panel provides the visual indication for the following:

* PDU – Displays all the PDU status information and associated faults.
* Control Panel – Displays the status of all the buttons and switches present on all the Control Panels and associated faults.
* Cargo Zone – Displays the access Zone information associated with each control panel.

## ​​​​​​​ Definitions, Acronyms & Abbreviations

### Definitions

|  |  |
| --- | --- |
| **Term** | **Definition / Interpretation** |
| PDU\_Healthy | PDU\_Health is identified as PDU\_Healthy when PDU\_Health received on the CAN bus is 0 |
| PDU\_HAS\_FAILURE | PDU\_Health is identified as PDU\_HAS\_FAILURE, when PDU\_Health received on the CAN bus is 1 |
| Automatic\_Hold | PDU Hold\_Release is identified as Automatic\_Hold when Hold\_Release received on the CAN bus is 0 |
| Release | PDU Hold\_Release is identified as Release when Hold\_Release received on the CAN bus is1 |
| PDU\_Covered | PDU\_Cover\_Status is identified as PDU\_Covered when PDU\_Cover\_Status received on CAN bus is 1 |
| Not\_Covered | PDU\_Cover\_Status is identified as Not\_Covered when PDU\_Cover\_Status received on CAN bus is 0 |
| Roller\_Rotating | PDU\_Roller\_Status is identified as Roller\_Rotating when PDU\_Roller\_Status received on CAN bus is 1 |
| Not\_Rotating | PDU\_Roller\_Status is identified as Not\_Rotating when PDU\_Roller\_Status received on CAN bus is 0 |
| Self\_Lifting | A PDU\_Type is identified as Self\_Lifting when PDU\_Type signal received on the CAN bus is 1 |
| Spring\_Loaded | A PDU\_Type is identified as Spring\_Loaded when PDU\_Type signal received on the CAN bus is 0 |
| Ground | The Ground state is asserted producing the Boolean 1 state |
| Open | The Open State is de-asserted producing a Boolean 0 state. |
| Platform Software | CDP Platform Software is a COTS software and hosts the Dataloader and operational Software. This is the base for all operations performed by CDP Data loader and operational Software and contains all libraries, packages and drivers utilized by both CDP Data Loader and Operational Software. |
| Operational Software | This is the Software application hosted by the CDP Platform SW. The operational SW processes all the CAN messages received and displays them on the touch screen display panel. The use of word Operational Software and application Software will be used interchangeably in this document. |

Table – Definitions

### Acronyms & Abbreviations

|  |  |
| --- | --- |
| **Acronym** | **Abbreviation** |
| ABD | Airbus Directive |
| AC | Alternating Current |
| AFDX | Avionics Full-DupleX Switched Ethernet |
| ARINC | Aeronautical Radio Incorporated |
| ARM | Advanced RISC Machine |
| ARP | Aerospace Recommended Practice |
| BIT | Built-In-Test |
| BITE | Built In Test Equipment |
| CAN | Controller Area Network |
| CAN825 | CAN as per ARINC825 Specification |
| CDP | Cargo Display Panel |
| CIRD | Configuration Item Requirements Document |
| CMS | Centralized Maintenance System |
| CP | Control Panel |
| CPU | Central Processing Unit |
| CPIOM | Core Processing and Input / Output Module |
| CRDC | Common Remote Data Concentrator |
| DC | Direct Current |
| DDR | Double Data Rate |
| DLCS | Data Loading and Configuration System |
| DLS | Data Loading System |
| ECMP | Electronic Component Management Plan |
| FAL | Final Assembly Line |
| HW | Hardware |
| Hz | Hertz |
| ICD | Interface Control Document |
| ICP | Inside Control Panel |
| IMA | Integrated Modular Avionics |
| KB | KiloBytes |
| LCP | Local Control Panel |
| LCD | Liquid Crystal Display |
| LVDS | Low Voltage Differential Signal for LCD displays |
| Mbps | Mega Bits Per Second |
| MCP | Master Control Panel |
| MDCLS | Main Deck Cargo Loading System |
| ms | milliseconds |
| NVM | Non-Volatile Memory |
| NA | Not Applicable |
| PB | Protocol Base |
| PDU | Power Drive Unit |
| PTS | Purchaser Technical Specification |
| OCP | Outside Control Panel |
| RAM | Random Access Memory |
| RISC | Reduced Instruction Set Computer |
| RTCA | Radio Technical Commission of Aeronautics |
| SAE | Society of Automotive Engineers |
| SMARC | Smart Mobility ARChitecture |
| SOC | System On Chip |
| SOM | System On Modules |
| SW | Software |
| ULD | Unit Load Device |
| USB | Universal Serial Bus |
| V | Volts |
| VDC | Voltage Direct Current |

Table - Acronym and abbreviations

## Requirement Conventions

Use of ‘shall’, ‘will’, ‘should’ and ‘may’ within this specification observes the following rules:

* 'Shall’ indicates a something that is required; traceability and verification are required.
* ‘Should’ expresses a recommendation.
* 'May’ provides a permission.
* 'Will’ indicates a characteristic of the system, an imposed characteristic of the system, or a supplier action; traceability and verification are not required.

 The requirements herein may be written at the box level or at a lower level.  The following terminology is used for consistency:

* Requirements applicable at the box level are indicated by "The CDP shall..."

# REFERENCES

The documents mentioned in below table were used to prepare this document. If the version number is not provided, the latest version of the document is used from the Configuration Management System.

| **File / Document / Version** | **Description** |  |
| --- | --- | --- |
| **Customer Documents** |  |  |
| A350F Layout\_PWR\_BUS\_20220914.cdr | CAN/Pwr Bus Layout Diagram |  |
| V5024WD2102340 | A350F Main Deck Cargo Loading System - Statement of Work/Contract |  |
| V5024PTSS21002 | PTS Main Deck Cargo Loading System (MDCLS) |  |
| V4230RQ0702729 | CAN Detailed Functional Specification |  |
| V42SP0806471 | DFS CAN Dataloading |  |
| V42ME2300903 | CAN Data Loading - Technical Note |  |
| ABD0100 g2-0.0 | Introduction |  |
| ABD0100 g2-1.1 | General Requirements |  |
| ABD0100 g2-1.2 | Environmental Conditions Requirements |  |
| ABD0100 g2-1.3 | Aircraft Operability and Design Maturity |  |
| ABD0100 g2-1.4 | Maintainability Requirements |  |
| ABD0100 g2-1.5 | Manufacturing and Maintenance Tests requirements |  |
| ABD0100 g2-1.6 | Identification and Marking |  |
| ABD0100 g2-1.7 | Mechanical Requirements |  |
| ABD0100 g2-1.8 | Electrical Characteristics for AC and DC Equipment |  |
| ABD0100 g2-1.9 | Electronic |  |
| ABD0100 g2-1.10 | Software |  |
| ABD0100 g2-2.1 | Safety & Reliability requirements |  |
| ABD0100 g2-2.2 | Validation & Verification requirements |  |
| ABD0100 g2-2.3 | Equipment Development and Assurance |  |
| ABD0100 g2-2.4 | Software Development and Assurance |  |
| ABD0100 g2-2.5 | Electronic Hardware Development and Assurance |  |
| ABD0100 g2-2.6 | Formal Equipment Qualification and Declaration of Performance |  |
| ABD0100 g2-2.7 | Configuration Management requirements |  |
| ABD0100 g2-2.8 | Equipment Physical and Functional Robustness |  |
| ABD0100 g2-3.0 | Reviews and Life Cycle Data Requirements |  |
| ABD0031 | Fireworthiness Requirements for the Pressurized section of Fuselage |  |
| ABD0078 | Corrosion Protection |  |
| VRQ2100929 | Main Deck Cargo Loading System Perceived Quality Requirements for the Purchaser Technical Specification |  |
| X51RSDP07003 | Hard Chromium Free and Cadmium Free Design Principle |  |
| V24RP0607448 | Electrical System Virtual Prototyping A350 SABER models requirements Get info for Electrical System Virtual Prototyping A350 SABER models requirements |  |
| M1666.3 | Security Assurance Requirements for Suppliers (SAR) |  |
| M1635.1 | Method for Aircraft Operability and Design Maturity - general Rules |  |
| M20328 | Stress Dossier Quality Assurance |  |
| GSD-H-002 | Airbus Requirements for Ergonomics in Production |  |
| FM1400906 | S50 Harmonised Static Stress Dossier Checklist |  |
| FM0300705 | Skill Template for Static Stress Report |  |
| FM2000751 | Maintainability and Maintenance Evaluation |  |
| FM2000776 | Maintainability and Maintenance Evaluation (MME) Economics Data |  |
| V020D21017347 | A350F - Preliminary requirements for CLS to be mounted over FAL and preFAL junctions |  |
| RP1513539 | Maintainability Standard Tool List |  |
| UG1801159 | Guidelines for Skill template FM300705 for Static Stress Report |  |
| TN\_ETI\_016\_01\_98 | CLS Climatic PDU Test |  |
| CML | Consumable Material List |  |
| **Regulatory and Industry Documents** |  |  |
| SAE-ARP 4754 | Certification considerations for highly integrated or complex air-craft systems. |  |
| SAE-ARP 4761 | Guidelines and Methods for conducting the Safety Assessment Process on Civil Airborne Systems and Equipment |  |
| RTCA DO160G | Environmental Conditions and Test Procedures for Airborne Equipment |  |
| RTCA DO178C | Software Considerations in Airborne Systems and Equipment Certification |  |
| RTCA DO254/ED-80 | Design Assurance Guidance For Airborne Electronic Hardware |  |
| ARINC 825 | General Standardization of CAN (Controller Area Network) Bus Protocol for Airborne Use - CAN-FD |  |
| ARINC 615A-3 | Software Data Loader Using Ethernet Interface |  |
| ARINC 665-3 | Loadable Software Standards |  |
| IEEE 802.3 | IEEE Standard for Ethernet |  |
| NAS3610 | Specification for Cargo Unit Load Devices |  |
| AS36100 | Air Cargo Unit Load Devices - Performance Requirements and Test Parameters |  |
| SAE-AS 8879 | Screw Threads |  |
| MIL-STD-1472 | Design Criterias Human Engineering |  |
| IATA ULD | IATA ULD Regulations Manual |  |
| EASA CS 25 | Certification Specification and Acceptable Means of Compliance for Large Aeroplanes |  |
| FAA FAR 25 | Airworthiness Standards - Transport Category Airplanes |  |
|  |  |  |
| **ANCRA Documents** |  |  |
| 11500 | System Development Plan |  |
| 11553 | System Qualification and Certification Plan |  |
| 11552 | System Validation and Verification Plan |  |
| 11560 | System Description Document A350 Integrated Cargo Handling System |  |
| 11632 | System Requirement Document |  |
| 11594 | INTERFACE CONTROL DOCUMENT FOR CAN COMMUNICATION (CAN - ICD) FOR THE A350-1000F MDCLS |  |
| 11595 | ELECTRICAL INTERFACE CONTROL DOCUMENT FOR THE A350-1000F MDCLS |  |
| 11647 | Plan for Hardware Aspects of Certification (PHAC) for CDP |  |
| 11644 | Plan for Software Aspects of Certification for CDP |  |
| 11399 | Electronic Component Management Plan FOR A350-1000F Main Deck Cargo Loading System |  |
| 11569 | Environmental Qualification Test Plan |  |
| 11907 | Mechanical CIRD |  |

Table - Reference Documents

# DESIGN REQUIREMENTS

## Certification Requirements

ID:CDP-CIRD-41434

The CDP **shall** be developed according to processes aligned with SAE ARP4754A, with the Function Development Assurance Level (FDAL) of Level D.

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Compliance Statement, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-41435

The CDP software **shall** be developed according to processes defined in RTCA DO-178C / EUROCAE ED-12C, with the Design Assurance Level (DAL) of Level D.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Compliance Statement, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-41437

The CDP hardware **shall** be developed according to the processes aligned with AMC 20-152A, DO-254/ EUROCAE ED-80 with the Design Assurance Level (DAL) of Level D.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Compliance Statement, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-41436

The equipment CDP **shall** demonstrate the compliance to ABD0100 g2.

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Compliance Statement, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52154

Components selection for the CDP **shall** comply with ECMP report 11399.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Compliance Statement, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52156

The CDP **shall** meet ABD0100 g2-1.8\_C,ABD0100 g2-1.9\_B requirements as applicable.

Note: Refer to Rpt 11486 (ABD0100\_G2\_REQUIREMENT COMPLIANCE ASSESSMENT MATRIX) for the requirements applicable for CDP.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Compliance Statement, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## CDP Hardware Architecture

The CDP consists of a 17-inch touch screen display, processor which utilizes SMARC (Smart Mobile Architecture) based SOM module, Double Data Rate Random Access Memory (DDR RAM), Discrete Input/Output Interface, Ethernet Interface, 28V DC power interface, CAN interface and a USB interface. The high level hardware architecture is illustrated in Figure 4 - CDP HARDWARE ARCHITECTURE.

The SMARC (“Smart Mobility ARChitecture”) is a versatile small form factor computer Module definition targeting applications that require low power, low costs, and high performance. The Modules will typically use ARM SOCs. Alternative low power SOCs and CPUs and other RISC CPUs may be used as well. The Modules are used as building blocks for portable and stationary embedded systems. The core CPU and support circuits, including DRAM, boot flash, power sequencing, CPU power supplies, Gigabit Ethernet and dual channel LVDS display transmitter are concentrated on the Module. The Modules are used with application specific Carrier Boards that implement features such as touch controllers. The modular approach allows scalability, fast time to market and upgradability while still maintaining low costs, low power and small physical size.

USB interface would be used to load the platform software at shop and the USB port is not accessible outside the CDP enclosure.

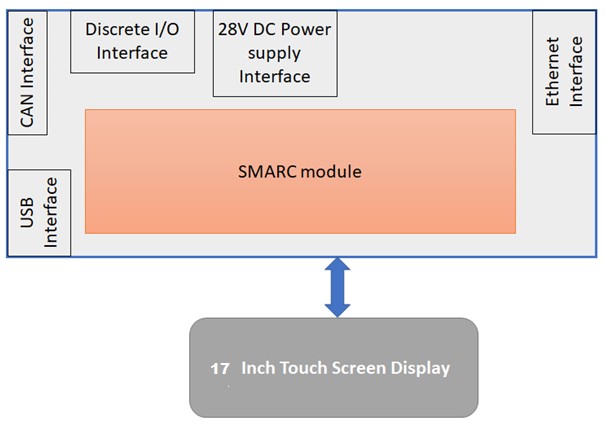


Figure 4 - CDP HARDWARE ARCHITECTURE

ID:CDP-CIRD-51992

The CDP **shall** use Intel Atom® based SMARC module.

**Applicability:** HW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies the processor to be used.  
**Verification Method:** Design Review  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

### Resource Allocation

#### Program Memory Allocation

ID:CDP-CIRD-29212

The CDP **shall** have DDR RAM with a minimum memory size of 4GB.

**Applicability:** HW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the RAM memory size to be used  
**Verification Method:** Analysis, Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-29213

The CDP **shall** have ARM, low power RISC or low power x86 CPUs / SOCs.

**Applicability:** HW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about internal interfaces used.  
**Verification Method:** Analysis, Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

#### Non-Volatile Memory Allocation

ID:CDP-CIRD-47932

The CDP **shall** provide NVM storage with a minimum of 128KB.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Inspection  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## CDP Power Supplies

ID:CDP-CIRD-26416

The CDP **shall** operate with input range 18.5VDC to 32.5VDC.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-26417

The CDP shall be in operative mode in less than 10 seconds after power-up.

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52153

The CDP **shall** not re-boot and remain in its mode of operation if the transparency time is less than 10ms.

Note: Refer ABD0100 g2-1.8 for definition of transparency time

**Applicability:** HW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the CDP transparency time.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-52155

The CDP **shall** protect against internal power supply failure.

Note: Refer ABD0100 g2-1.9 Section 5.1.3 for details.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Analysis  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52157

The CDP **shall** draw no more than 3 Amps from the power bus at its full operation.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## CDP Interfaces

The CDP willprovide a 100Mbps Ethernet port for future use.

ID:CDP-CIRD-26419

The CDP **shall** provide a CAN interface port with maximum 1Mbps data rate.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-26422

The CDP **shall** provide 6 spare pins in the external connector that connects to the Aircraft electrical interface.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-26424

The CDP **shall** provide a 17-inch touch screen color display screen with 1920 X 1080 resolution and 60Hz refresh rate.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Inspection  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-26421

The CDP **shall** provide a USB interface to support loading of the Platform Software.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Inspection  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-96704

The CDP shall provide means to access the USB interface only at the shop and not operable during service..

**Applicability:** HW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement specifies the criteria under which the USB interface could be accessible.  
**Verification Method:** Analysis, Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-85128

The CDP aircraft connector **shall** meet the specifications identified in Interface Control Document for A350 Main Deck Cargo Loading System Electrical,Rpt 11595

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-41439

The CDP **shall** have one EN3646RS1419 male contact external connector (P3) to interface with aircraft harness signals. Refer to the below figure for the connector layout.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

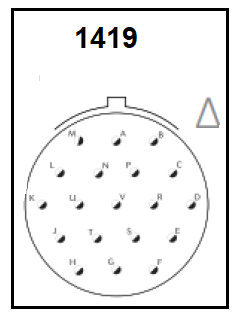


Figure 5 - CDP P3 CONNECTOR

ID:CDP-CIRD-41442

The CDP **shall** have pin mapping from the aircraft connector to P3 connector as shown in the table below.

**Applicability:** HW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about connector details.  
**Verification Method:** Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No** | **Signal name** | **Pin number (P3) EN3646 1419** | **Description** |
| 1 | CAN\_H | A | CAN Bus High signal |
| 2 | CAN\_L | B | CAN Bus Low signal |
| 3 | CAN\_SHLD | C | CAN Bus Shield |
| 4 | 28V\_IN | G | 28V DC power input |
| 5 | 28V\_GND | H | Ground signal |
| 6 | CASE\_GROUND | D | CASE GROUND |
| 7 | HPP\_ADD\_1 | L | Hardware Pin program 1 (OPEN) |
| 8 | HPP\_ADD\_2 | M | Hardware Pin program 2 (OPEN) |
| 9 | HPP\_ADD\_3 | N | Hardware Pin program 3 (GND) |
| 10 | HPP\_ADD\_4 | P | Hardware Pin program 4 (GND) |
| 11 | HPP\_ADD\_PAR | R | Hardware Pin program parity pin (GND)    (Odd Parity) |
| 12 | HPP\_ADD\_GND | S | Ground pin for pin programming |
| 13 | Bonding | E | Bonding pin of Enclosure |
| 14 | SPARE\_1 | F | Spare pin for future use |
| 15 | SPARE\_2 | J | Spare pin for future use |
| 16 | SPARE\_3 | K | Spare pin for future use |
| 17 | SPARE\_4 | T | Spare pin for future use |
| 18 | SPARE\_5 | U | Spare pin for future use |
| 19 | SPARE\_6 | V | Spare pin for future use |

Table - CDP Electrical Interface Signals at connector

ID:CDP-CIRD-43458

The CDP HW **shall** provide 5 pin-programming configuration discretes

* 4 discrete pins for CDP installation address
* 1 discrete pin for Parity

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-50113

The CDP HW **shall** implement the 5 pin programming pins as Ground/Open circuit type discrete inputs.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-50116

The CDP HW **shall** provide a source current of 1 mA +/- 15% for each programming pin.

**Applicability:** HW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the electrical characteristics  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105531

The CDP **shall** have an external watchdog timer.

**Applicability:** HW  
**Object Type:** Derived  
**Rational for Derived Req:**Requirement is related to the need for watchdog timer.  
**Verification Method:** Design Review  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105532

The CDP **shall** service the watchdog timer periodically to avoid watchdog reset.

**Applicability:** HW, SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to servicing the watchdog timer inorder to avoid soft reset.  
**Verification Method:** Design Review  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

## CDP Built in Test

ID:CDP-CIRD-105500

The CDP **shall** initiate the following continuous monitor,1 sec after transitioning to Live Operational Mode.

* CAN Input Fault monitor

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement describes about when the CDP CBIT test starts executing and the tests involved.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

### Continuous Fault and Monitoring Function

#### Signals Subject to ADC Monitoring

##### Input Voltage Measurement

ID:CDP-CIRD-52023

The CDP **shall** measure its 28VDC input voltage as Measured\_Voltage and transmit on CAN bus.

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

##### Input Current Measurement

ID:CDP-CIRD-51862

The CDP **shall** measure its 28VDC input current consumption as Measured\_Current and transmit on CAN bus.

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

#### CAN Input Fault  Monitor

ID:CDP-CIRD-105716

The CDP shall check for the following faults as part of CAN Input fault Monitor:

* CAN LRU\_X\_Data Stale Fault
* CAN Input data fault

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to CAN input fault monitor.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105507

The CDP **shall** set CAN LRU\_X\_Data stale fault if the CDP did not receive any data from the respective LRU for more than 2 consecutive frames.

Additional Information :LRU\_X corresponds to CP / PDU / CPIOM as determined by the translated node Identifier

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to CAN input fault monitor.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105515

The CDP **shall** perform the following if CAN LRU\_X\_Data stale fault is set for more than 1 sec:

* If LRU\_X corresponds to any of the CPs,
  + Visually indicate the respective Panel to off / LCP to Disabled state across the Main and Maintenance pages CP Symbol and
  + Indicate Panel on/off to off state for MCP/ICP/OCP and Panel Enabled to  Disabled for LCP on the CP status page and reset all other signals to default state
* If LRU\_X corresponds to any of the PDUs,
  + Visually indicate the respective PDU state to No Data across the Main and Maintenance pages PDU Symbol and
  + Indicate PDU General Status to No Data on PDU status page and reset all other signals to default state

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to CAN input fault monitor.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105513

The CDP **shall** inhibit the detection of CAN LRU\_X\_Data Stale fault upon power up until the CDP enters into Live Operational Mode.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to CAN input fault monitor.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105529

The CDP **shal**l store the CAN LRU\_X\_Data Stale fault in NVM upon detection.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to CAN input fault monitor.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105508

The CDP **shall** set CAN input data fault if the input data received is invalid.

Additional Information: The Validity of CAN input data needs to be determined based on the controller status registers. Refer to ARINC 825-4 document for the details regarding the errors

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to CAN input fault monitor.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105516

The CDP **shall** pop up error message on the CDP display screen as "Maintenance Required [CAN Bus Down]" when a CAN input data fault is detected.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to CAN input fault monitor.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105530

The CDP **shall** store the CAN input data fault in NVM upon detection.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is related to CAN input fault monitor.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

### Power on Self-Test (POST)

Power on Self-Test (POST) is performed after the power-up. The purpose of the POST is to ensure that CDP is initialized correctly as determined by the hardware pin programming discretes, and to confirm the software integrity by verifying the SW CRC.

ID:CDP-CIRD-47952

The CDP **shall** execute the following tests during POST:

1) SMARC Module Internal Memory Read-Write Test

2) CDP NVM Read-Write Test

3) CAN Loopback Test

4) CDP CAN PIN Address Odd Parity Test

5) CDP Operation Software CRC integrity Test

6) CDP NVM Header Checksum Test

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52274

The CDP **shall** set POST\_Fail to True if any of the following faults are True

* CDP\_SMARC\_DDR\_Read\_Write\_Fault
* CDP\_Operational\_Software\_CRC\_Fault
* CDP\_CAN\_Loopback\_Fault

and to False otherwise.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the criteria's that set the SBIT Failure.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

#### CDP CAN PIN Address Odd Parity Test

The CDP will perform a validity check of the CDP pin programming discrete pins and the parity pin to ensure the LRU is installed in a valid position identified for the CDP.

ID:CDP-CIRD-25798

The CDP **shall** decode its Pin programming discretes to determine the installation address in accordance with the following table:

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LRU** **ID** | **HPP\_ADD\_PAR** | **HPP\_ADD\_4** | **HPP\_ADD\_3** | **HPP\_ADD\_2** | **HPP\_ADD\_1** |
| CDP | GND | GND | GND | OPEN | OPEN |

Table - CDP HARDWARE PIN PROGRAMMING DISCRETES ASSIGNMENT

ID:CDP-CIRD-44186

The CDP **shall** determine any single failure of pin programming discrete input applying the odd Parity Check

Additional Information: For odd parity, if the sum of all data bits is even, excluding the parity bit, the parity bit should be set to 1, else if the sum of all data bits is odd, the parity bit is set to 0.

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-47954

The CDP **shall** set Parity\_Valid to False  if the Parity bit read from the HPP\_ADDR\_PAR doesnot match with the computed Parity else set Parity\_Valid to True.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52264

The CDP **shall** set HPP\_ADDR\_Disc\_Valid to True if the discrete address pins [ HPP\_ADD\_1 to  HPP\_ADD\_4] matches with the Pin programming discrete mentioned in Table 7 - CDP HARDWARE PIN PROGRAMMING DISCRETES ASSIGNMENT else set HPP\_ADDR\_Disc\_Valid to False.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52270

The CDP **shall** set CDP\_CAN\_Address\_Pin\_Parity\_Fault to True if Parity\_Valid is False or HPP\_ADDR\_Disc\_Valid is False

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52271

The CDP **shall** perform the following when CDP\_CAN\_Address\_Pin\_Parity\_Fault is True:

* Store the CDP\_CAN\_Address\_Pin\_Parity\_Fault in NVM
* Transmit the fault event over CAN if CDP\_CAN\_Loopback\_Fault is False

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105533

The CDP **shall** use Invalid node ID 28 for CAN messaging when CDP\_CAN\_Address\_Pin\_Parity\_Fault is True.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105534

The CDP **shall** pop up error message on the CDP display screen as "Maintenance Required [INVALID CONFIG ID] "when CDP\_CAN\_Address\_Pin\_Parity\_Fault is True.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement describes the display message in case of Address pin failure  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-47955

The CDP **shall** latch its installation address until the power is cycled.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement for latching the installation address.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

#### CDP Operational Software integrity test

The Operational Software Integrity test uses the Operational SW CRC to confirm software integrity.

If a failure of the CDP Operational SW Integrity is detected, the CDP inhibits executing its application program.

ID:CDP-CIRD-47956

The CDP software **shall** read the software CRC from flash memory during POST.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the process of reading the SW CRC from Flash memory during SBIT.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-47958

The CDP **shall** verify the Operational SW Integrity during POST by verifying that the embedded Software CRC matches the computed CRC value.

Note: The actual CRC is performed after transferring the Operational SW to RAM.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about verifying the Operational SW integrity.   
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-52272

The CDP **shall** set CDP\_Operational\_Software\_CRC\_Fault to True if the embedded SW CRC doesnot match with the computed CRC and to False otherwise.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the criteria to detect an Operational SW Integrity Fault.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-52273

The CDP **shall** store the CDP\_Operational\_Software\_CRC\_Fault in NVM if set.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-85272

The CDP **shall** use the CRC-32-IEEE802.3 polynomial: 0xF4ACFB13 (seed value 0xFFFFFFFF) and perform XOR with the output and 0xFFFFFFFF for CRC computation of Operational Software.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105535

The CDP **shall** pop up error message on the CDP display screen as "Maintenance Required [Application SW Image Error]" when CDP\_Operational\_Software\_CRC\_Fault is True

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement describes the display message incase of Operation SW CRC Fault  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105536

The CDP **shall** transmit CDP\_Operational\_Software\_CRC\_Fault on CAN if CDP\_CAN\_Loopback\_Fault is False.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

#### SMARC Module Internal Memory Read-Write Test

ID:CDP-CIRD-105541

The CDP **shall** test the main memory (DDR) on SMARC Module for the ability to read or write both a 1 and 0 to each of the memory location used.

**Applicability:** HW, SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is about the SMARC memory Read write test  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105542

The CDP **shall** set CDP\_SMARC\_DDR\_Read\_Write\_Fault to True if the Read-Write test on the main memory fails.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105543

The CDP **shall** perform the following when CDP\_SMARC\_DDR\_Read\_Write\_Fault is True:

* Store the SMARC\_DDR\_Read\_Write\_Fault in NVM

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

#### CAN Loopback Test

CAN loopback test is used to check the CAN transceiver ability to transmit and receive data by enabling the loopback mode and send a pattern through the transmit buffer and check if the same pattern has been received in the receive buffer.

ID:CDP-CIRD-105545

During the CAN Loopback test, the CDP **shall** set the CAN transceiver in loopback mode.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement specifies about enabling the CAN in loopback mode so that whatever data is transmitted, the same would be received by the CAN receiver..  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105514

The CDP **shall** test the ability of CAN transceiver by sending a pattern of 1 and 0 and check if the same pattern has been received.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement specifies the procedure for the CAN loop back test  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105586

The CDP shall set the CDP\_CAN\_Loopback\_Fault to True if the pattern received does not match with the pattern sent.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105587

The CDP **shall** perform the following when the CDP\_CAN\_Loopback\_Fault is detected:

* Store the CDP\_CAN\_Loopback\_Fault in NVM.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105588

The CDP **shall** disable the loopback mode upon completion of CAN Loopback Test.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is about disabling the loopback mode once the test is done so that the CAN transceiver is back to default smode  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

#### CDP NVM Read-Write Test

ID:CDP-CIRD-105589

The CDP **shall** test the NVM for the ability to read or write both a 1 and 0 to each of the memory location used.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is about the procedure to test the NVM memory  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105590

The CDP **shall** set CDP\_NVM\_Read\_Write\_Fault to True if the Read-Write test on the NVM fails.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105591

The CDP **shall** perform the following when CDP\_NVM\_Read\_Write\_Fault is detected:

* Transmit the fault event over the CAN

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

#### CDP NVM Header Checksum Test

ID:CDP-CIRD-105592

The CDP **shall** test the NVM data integrity by comparing the checksum from the NVM header record and the checksum calculated from the last NVM write.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement is to check the NVM data integrity  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105593

The CDP **shall** set the CDP\_NVM\_Header\_Checksum\_Fault if the checksum from the NVM header record doesnot match with the calculated checksum,

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105594

The CDP **shall** perform the following when CDP\_NVM\_Header\_Checksum\_Fault is detected:

* Transmit the fault event over the CAN
* Reset NVM Header Record

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## Configuration Information and Reporting

After power up, when CPIOM-SB receives the first heartbeat message from the CDP, the CPIOM-SB transmits the FIN, Date, Time, MSN and Airport city code, periodically to CDP every 5 seconds. On receipt of these information, CDP memorizes the same and transmits its configuration identification data on CAN bus to CPIOM.

The CDP receives the following information from CPIOM-SB via CAN bus after power-up:

* Hardware Function Identifier (HW FIN)
* Date and Time
* Manufacturer Serial Number (MSN)
* Airport City Code

Refer Section 4.2.1.4 for Configuration information message Received from CPIOM

ID:CDP-CIRD-105596

The CDP **shall** record HW FIN, DATE/TIME, MSN and AIRPORT CODE in the NVM upon the receipt of complete configuration information.

Additional Information: This is recorded in 'Configuration Data Area' of the NVM along with other information defined in CDP-CIRD-105601.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105597

On successful receipt of the HW FIN, Date, Time, MSN and Airport code, the CDP **shall** transmit configuration data as shown below:

* Hardware Part Number (HW\_PN)
* Hardware Functional Identification (HW\_FIN)
* Software Part Number (SW\_PN)
* Software Functional Identification (SW\_FIN) of FLS.

Additional Information:

HW\_PN : 88153-10 [HW\_PN should be as per product breakdown structure Report 11363]

SW\_PN: ANC2888153CDPSW [SW\_PN should be as per product breakdown structure Report 11363

HW\_FIN: HW\_FIN is the received LRU\_FIN [1051MU]

SW\_FIN: SW\_FIN is HW\_FIN appended with "SW1" for CDP Application Software [1051MUSW1]

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105598

The CDP **shall** transmit its configuration data via CAN Tx Message CONFIGURATION\_DATA , every 1 minute.

Note Refer CDP-CIRD-90779 for payload details of CAN Tx Message Configuration\_Data

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## NVM Storage

For maintenance, diagnostic and troubleshooting purposes, the Non-Volatile Memory (NVM) of the CDP stores the following sections of data:

* NVM Header
* Configuration Record
* CDP Power-On Time
* Fault Record
* Other Information

ID:CDP-CIRD-105599

The CDP NVM record update **shall** implement the round-robin update scheme if the maximum number of records have been reached within that NVM section.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105601

The CDP NVM data recording layout **shall** be per "Table - CDP NVM Layout" shown below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |  |  |
| --- | --- | --- | --- |
| **CDP NVM Layout** | | | |
| **NVM Header** | | |  |
| Start NVM offset of Header | | |  |
| Configuration Record Count | 1 Byte | Max 5 records (overwrite oldest) | **6 bytes used** |
| Fault Record Count | 1 Byte | Max 50 records (overwrite oldest) |
| Reserved / Spare | 3 Bytes | Set to 0. |
| NVM Header Checksum | 1 Byte | 2's comp checksum of the first 5 bytes |
| End NVM offset of Header | | |  |
| **Configuration Record** | | |  |
| Start NVM offset of Configuration Record | | |  |
| Record number | 1 Byte | Integer | **30 bytes/rec x 5 records = 150 bytes used** |
| HW FIN | 8 Bytes | 8 ASCII characters |
| SW FIN | 12 Bytes | 12 ASCII characters |
| MSN | 4 Bytes | 4 ASCII characters |
| CITY CODE | 4 Bytes | 4 ASCII characters |
| Address Configuration / Node ID | 1 Byte | Integer |
| End NVM offset of Configuration Record | | |  |
| **CDP Power-On Time Record** | | |  |
| Start NVM offset of Record | | | **20 bytes used** |
| Power-up Time | 8 Bytes | YY-MM-DD-HH-MM-SS-[.n] |
| CITY CODE | 4 Bytes | 4 ASCII characters |
| Address Configuration / Node ID | 1 Byte | Integer |
| End Time (updated every 1 second) | 8 Bytes | YY-MM-DD-HH-MM-SS-[.n] |
| End NVM offset of Record | | |  |
| **Fault Record** | | |  |
| Start NVM offset of Fault Record | | |  |
| Record number | 1 Byte | Integer | **15 bytes/rec  x 50 rec  = 750 bytes used** |
| FSID | 1 Byte | Integer |
| UTC (Date and Time) | 8 Bytes | UTC |
| CITY CODE | 4 Bytes | 4 ASCII characters |
| End NVM offset of Fault Record | | |  |
| **Other Information** | | |  |
| Start NVM offset of Other Information | | |  |
| Dataload Request Flag | 1 Byte |  | **2 bytes used** |
| DLA Assigned LRU\_ID | 1 Byte |  |
| End NVM offset of Other Information | | |  |

Table - CDP NVM Layout

ID:CDP-CIRD-105604

For the NVM Configuration Record, the CDP **shall** use the HW FIN, MSN, CITY CODE and Node ID received from the SBITE.

**Applicability:** SW  
**Object Type:** Verbatim  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105605

For each Flight Leg, the CDP**shall** maintain an updated NVM Configuration Record for the last 5 Flight Legs.

**Applicability:** SW  
**Object Type:** Verbatim  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105606

The CDP**shall** record the Power-up Time in the CDP Power-On Time Record after completing initialization.

**Applicability:** SW  
**Object Type:** Verbatim  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105607

The CDP **shall** update the End Time of the CDP Power-On Time Record every 1 second.

**Applicability:** SW  
**Object Type:** Verbatim  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105608

The CDP **shall** create a record in NVM Fault Record section for each one of the faults listed in "Table - CDP FSID" that has transitioned from not-detected to detected.

**Applicability:** SW  
**Object Type:** Verbatim  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105609

For the NVM Fault Record, the CDP **shall** retrieve the FSID from "Table - CDP FSID" per the fault detected.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |  |
| --- | --- | --- |
| FSID | Stage | CDP Fault Monitored |
| 001 | POST | SMARC Module Internal Memory Integrity Check |
| 002 | POST | CAN Loopback Check |
| 003 | CBIT | CAN Input Data Fault |
| 004 | CBIT | CAN LRU\_X Stale Data Fault |
| 620 | POST | CAN PIN Address Odd Parity Check |
| 621 | POST | NVM Read-Write Check |
| 622 | POST | Operation Software CRC Check |
| 623 | POST | NVM Header Checksum Check |

Table - CDP FSID

## Data Loading Application

ID:CDP-CIRD-52262

The CDP Operational Software **shall** be field loadable and formatted in accordance with ARINC 665-3 standard.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105626

The size of the CDP load data **shall** be limited to 4 MBytes.

Additional information: Refer to the ABD0100 g2.1.4-481-A requirement and V42SP0806471 which limits the size of data blocks to 8196 Bytes.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105627

The CDP Software Load file **shall** be identified by Software Part Number (SW PN) as per ABD0100 g2.1.4-305-A requirement; and listed in table below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **Software Identification** | **Software Part Number**  **(SW PN)** |
| CDP Application Software | ANC2888153CDPSW |

Table - CDP SW PN

ID:CDP-CIRD-41438

The CDP **shall** provide a means to perform data loading of the Operational software using the CAN bus and protocol established by CAN ICD ("Rpt 11594")

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Analysis  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-47964

During Data Loading Mode, the CDP **shall** not use the CAN port for any other operation.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105629

The CDP Data Loading operation shall not exceed 15 minutes.

Additional Information: Refer to the ABD0100 g2.1.4-324-A requirement.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

The CDP Data loading is divided into three phases:

* Data loading Initialization Phase.
* Loading Phase.
* End of Data loading Phase

### Dataloading Initialization Phase

ID:CDP-CIRD-105667

The CDP **shall** transition from Live Data mode to Data Loading Mode when the 'Upload Request' is received from the Data Load Application on the CAN bus with matching SW FIN in reduced format.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105643

The CDP **shall** perform the following when it detects an Upload Request which payload matches its own SW FIN number:

* Set DL Request to True and Store it in NVM.
* Memorize the LRU\_ID field in the Upload Request.
* Unmute the CAN port (if muted).
* Enter into Initialization phase.
* Answer to the DLA sending an Upload Response using the memorized LRU\_ID in the following 5 seconds.

Additional Information:

1. CDP receives the Upload request with the following in the arbitration field:

* Source FID = 42 [ATA 42]
* Function ID = 01
* LRU ID is set dynamically by the Host Data Loader Application based on the number of LRUs to data load in the specific session.

2. CDP DL SW waits for 300 Sec on a muted CAN port and if it receives a matching SW FIN with in 300 Sec, it unmutes the CAN port.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105644

The CDP **shall** perform the following if it receives UPLOAD request but doesnot contain its own SW FIN number

* Mute its CAN port
* Remain in Live data Mode.

Additional Information: Muting the CAN port means that the LRU cannot send traffic through the bus but keeps listening.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105645

The CDP shall unmute the CAN port when in Live data mode and if any of the following conditions exists:

* 'Upload Request' received with 0xFF in all 8 bytes of its payload, or
* 'Upload Request' received with matching 'SW FIN' within 300 seconds, or
* There is no CAN data loading traffic detected for a time longer than 300 Seconds.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

### Loading Phase

ID:CDP-CIRD-105683

When entering the “Loading Phase”, the CDP shall wait for the first data block for 10N+5(N-1) seconds, where N is the 'LRU ID' the LRU has memorized in decimal format.

Additional Information: Refer to CDP-CIRD-105643 for 'LRU ID' as received in arbitration field and memorized by LRU.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105684

The CDP shall receive 'upload data' in blocks of 96 bytes, using window of 12 Upload Data messages, every 50 +/- 5 msec.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105685

The CDP shall receive the first data block with Alt\_bit field as 0 (zero) and this value is inversed for each of the following data blocks unless the same data block has been received again (incase if the last block was received incorrectly).

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105647

Following the reception of the first data block, the CDP shall evaluate its compatibility with the Load. The CDP sends an 'Upload Response' with 'ACK' code if compatible; alternatively, with 'NAK' code in the following 5 seconds indicating 'Incompatible Load'.

Additional Information: The CDP performs the 'Hardware/Software compatibility' to ensure that software part number is designed to be loaded into the CDP.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105648

The CDP shall abort the data loading, if it

* Receives an abort instruction from DLA (i.e., Upload Request with 0x0F in all bytes of its payload)
* Incompatible load is received.
* Not able to transmit ‘Upload Response’ message within timeout period (5 seconds).

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105649

Anytime during the data loading process, if the CDP receives an 'Upload Request' with 0xFF in its all bytes of payload, the CDP shall abort the data loading process by itself and perform the following:

* Mute the CAN port.
* Enter into 'Operational Mode'.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105650

After receipt of last 'Upload Data' block, if the CDP receives an 'Upload Request' message with 0x0F in all 8 bytes of its payload, the CDP**shall** enter into 'End of Data Loading Phase'.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

### End of Data Loading Phase

ID:CDP-CIRD-105652

The CDP **shall** perform the following internal operation in less than 2 minutes (120 seconds):

* Check the integrity of the Load.
* Program the internal flash memory using the Load.
* Check the integrity on flash.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105653

The CDP shall send an 'Upload Response' message to the DLA with 'COMPLETE' code in the following 5 seconds, when all internal operations have been performed without problems

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105654

If any internal operations have reported problems, the CDP shall send an 'Upload Response' message to the DLA with 'NAK' code in the following 5 seconds. In this response the 'Upload Response' includes the details of the failure, i.e., CRC fail after programmed into Flash.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105655

The CDP **shall** transition into Live data mode when it receives the 'Upload Request' with 0xFF in its payload twice.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## Mechanical Specifications

Refer Mechanical CIRD document Rpt 11907 for the mechanical specifications of the CDP.

## Growth Provision Requirements

ID:CDP-CIRD-51852

The following spare capacities **shall** be provided with CDP for later expansion:

* 50% additional RAM/ROM Capacity

**Applicability:** HW, SW  
**Object Type:** Verbatim  
**Verification Method:** Analysis  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## Safety and Reliability Requirements

ID:CDP-CIRD-51854

The CDP **shall** be designed to provide guarantee of 500000 Flight hours MTBF or 100000 Flight Cycles MCBF, whichever occurs last.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Analysis  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-85549

The CDP shall be designed to minimize the risk of unintentional misuse.

**Applicability:** HW, SW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## Environmental Requirements

ID:CDP-CIRD-51856

The CDP **shall** comply with the requirements of ABD0100 g2-1.2 as applicable.

Note: Refer to Rpt 11486 (ABD0100\_G2\_REQUIREMENT COMPLIANCE ASSESSMENT MATRIX) for the requirements applicable for CDP.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Compliance Statement, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-84404

The CDP **shall** meet the environmental requirements as defined in the Environmental Qualification Test Plan, Rpt 11569.

**Applicability:** HW  
**Object Type:** Decomposed  
**Verification Method:** Compliance Statement, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52055

The CDP **shall** be protected against corrosion resulting from contact between solid materials and considering occurrence of the following fluids (alone and in combination):

* Heat transfer fluids
* Cleaning agents (e.g. Synclair A2 Gel, Ardrox1900B)
* Disinfectants (e.g. Airdal)
* Extinguishing agents
* Insecticides
* Sea Salt water
* Animal urine
* Water / waste

**Applicability:** HW  
**Object Type:** Verbatim  
**Verification Method:** Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52056

Selected materials and surface protection as well as their combinations **shall** be compatible with the aircraft interfaces to avoid corrosion issues.

**Applicability:** HW  
**Object Type:** Verbatim  
**Verification Method:** Design Review, Inspection  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52057

The CDP **shall** be adequately protected to avoid (self-) corrosion.

**Applicability:** HW  
**Object Type:** Verbatim  
**Verification Method:** Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

### Temperature

ID:CDP-CIRD-51861

The CDP **shall** operate within the temperature range of -40 °C to +70 °C.

**Applicability:** HW  
**Object Type:** Verbatim  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-52065

The CDP **shall** not be damaged by, and remain functional after, exposure to temperatures within the range of -55 deg C to +85 deg C.

**Applicability:** HW  
**Object Type:** Verbatim  
**Verification Method:** Analysis  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## Design Life Requirements

ID:CDP-CIRD-51858

The CDP **shall** be designed for a useful life of at least 120000 FH corresponding to 28800 flight cycles or 25 years whatever comes first.

**Applicability:** HW  
**Object Type:** Verbatim  
**Verification Method:** Analysis  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## Display Characteristics

ID:CDP-CIRD-90374

The CDP **shall** keep its brightness and contrast settings at 50% of their maximum values.

**Applicability:** HW, SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement specifies the default setting for display brightness and contrast.  
**Verification Method:** Design Review  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105487

The CDP **shall** provide sufficient resolution and minimum line width to support all the displayed images such that the displayed information is visible and understandable without misinterpretation in all foreseeable conditions, relative to the operational and lighting environment.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement describes the general requirement for display resolution and the detailing of the information  
**Verification Method:** Design Review, Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-105488

The CDP **shall** be designed to be operable with gloves.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Inspection  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105489

The CDP **shall** be designed so that the display screen can withstand cleaning / operation without internal damage, scratching, and/or crazing (cracking).

**Object Type:** Derived  
**Rational for Derived Req:**This requirement describes about the display scratch resistance  
**Verification Method:** Design Review, Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

# CDP SOFTWARE REQUIREMENTS

## CDP MODES

The CDP operates in one of the following modes. CDP mode transitions are illustrated in the below figure:

* Off Mode : The CDP is unpowered and the display is off.
* Initialization Mode : Initiated following the application of 28 VDC or at Power On Reset, initializes hardware, software and determines configuration.
* Live data mode : The CDP enters Live Data Mode after successful initialization and continues to stay in this mode.
* Invalid Mode : The CDP enters Invalid Mode when the initialization is Failed.
* Data Loading Mode : The CDP enters Data Loading Mode following the reception of Data load Request.

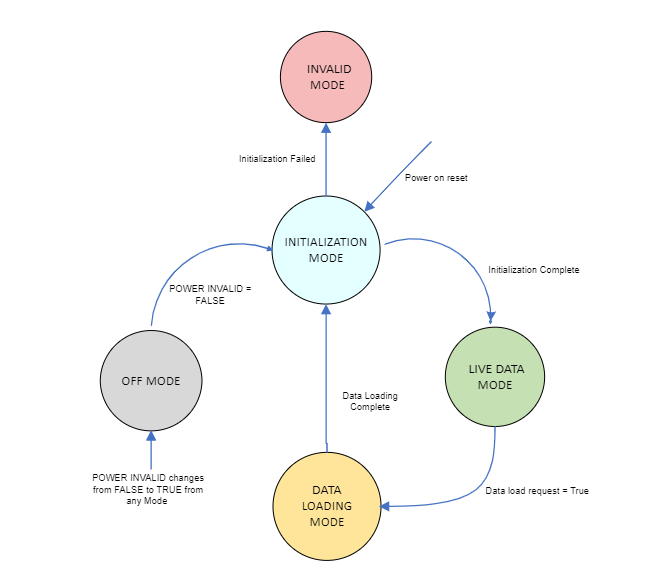


Figure 6 - CDP MODES

### OFF Mode

The OFF Mode is defined as, the power to the CDP is below a minimum operating voltage (less than 18.5 VDC) for more than 10ms. During this mode, the CDP application SW will log any existing faults and issue the shutdown command to Platform SW. CDP display will be switched off during this mode.

ID:CDP-CIRD-47941

The CDP **shall** set the "Power Invalid" to TRUE when the following condition is met. Otherwise, set to False.

* Input Power Voltage is less than 18.5 VDC for more than 10ms.

**Applicability:** HW, SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies the criteria to set the Power Invalid which is an input condition to transition to OFF Mode.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-47942

The CDP **shall** transition to OFF Mode when "Power Invalid" is True.

**Applicability:** HW, SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies the transition criteria for OFF Mode  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-47943

The CDP **shall** perform the following in "OFF Mode":

* CAN communication [both transmitter and receiver] disabled
* CDP Display Disabled
* Log any existing faults in NVM.
* Shut down the Platform SW.

**Applicability:** HW, SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the operations performed in OFF mode.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

### Initialization Mode

Once the power is applied, the CDP enters Initialization Mode and remains in this mode until the Initialization Sequence Completes. The Initialization Sequence is defined as a sequence of steps that define the initial states of all of the input and output signals of the CDP. During the Initialization Mode, the CDP determines its installation address, initializes RAM Memory, initializes faults(if any) to unfailed state, initializes CDP output states.

ID:CDP-CIRD-47945

The CDP **shall** transition to Initialization mode if Power on Reset occurs or Power Invalid transitions from True to False and remains to be False.

Note : A power Cycle will trigger a Power on Reset.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies the transition criteria for Initialization Mode.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-47946

After transitioning to Initialization Mode, the CDP **shall** execute the following in sequence:

* Initialize Hardware Components
* Boot the Platform Software
* Execute Power on Self Test (POST)
* Transition to Live data Mode / Invalid Mode

Note: Refer Section 3.5.2 for POST

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-47947

The CDP **shall** set its outputs as follows while in "Initialization Mode"

* CAN communication [both transmitter and receiver] disabled
* CDP Display Enabled

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the operations performed in Initialization mode.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-47948

The CDP **shall** consider Initialization as successful and Complete if POST\_Fail remains to be in False upon POST completion.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies the criteria for Initialization to be considered as successful.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-47949

The CDP **shall** consider Initialization Failed if POST\_Fail is True.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies the criteria for Initialization to be considered as Fail.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

From Initialization Mode, the CDP will either transition to Live data Mode or Invalid Mode, depending upon the status of POST\_Fail. If the POST\_Fail is True, then the CDP transitions to the Invalid Mode, otherwise to Live Data Mode.

### Live data Mode

The Live Data mode is defined as normal operational mode. In this mode CDP enables CDP display, performs CAN data processing, display the main page layout and update all the indication functions based on associated incoming data. This mode also enables to navigate to other pages.

ID:CDP-CIRD-47959

Upon successful completion of the initialization mode, the CDP **shall** transition to Live data mode.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-47960

The CDP **shall** perform the following in Live Data Mode:

* Enable CAN Communication [Receiver and Transmitter]
* Enable the Display screen
* Perform screen touch processing
* CAN Receive message Processing
* CAN signal to Display indication mapping
* CDP SW Application Page determination and visual display.
* Update LRU status indications
* Application Pages Navigation Processing

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the operations performed in Live Data mode.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-96705

The CDP **shall** display the Main Page after transitioning to the Live data Mode.

Note: Refer Section 4.4 for the Main page details

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement details about the first page as soon as the CDP becomes operational..  
**Verification Method:** Inspection, Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

### Invalid Mode

Invalid mode is defined to be a Fail Safe Mode. When CDP detects HW Pin programming fault or Operational SW integrity Failure, the CDP transitions to Invalid Mode and disables the CAN communication and the display.

ID:CDP-CIRD-47961

The CDP **shall** enter Invalid Mode if the Initialization is Failed i.e POST\_Fail is True .

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-47962

The CDP **shall** perform the following in Invalid Mode:

* Remain idle until power reset.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

### Data Loading Mode

The CDP will transition to Data load mode from Live Data mode when it receives the data load request from DLCS. During Data load mode, CDP will receive new operational software image via CAN bus as per the protocol defined in CAN Dataloading Detailed Functional Specification. CDP will use RAM memory to store the new operational SW image while it is receiving from DLCS. Once the complete image has been received, the image will be written into flash memory operational SW partition.

The following diagram shows the general architecture for Remote Data Loading using the CAN bus as a connection between Data Loader application on the IMA module and CDP.

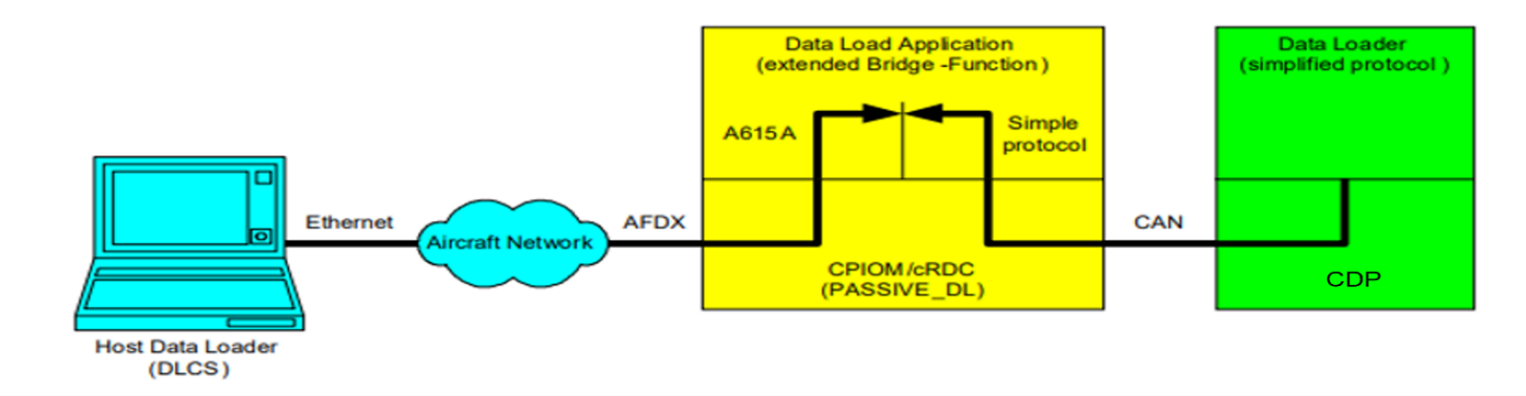


Figure 7 - CDP CAN Data Loader

In Data loading mode, the CDP performs data loading of the application software following 'CAN data loading - Detailed Functional Specification' (DFS CAN DL "V42SP0806471").

ID:CDP-CIRD-47963

The CDP **shall** transition from Live Data mode to Data Loading Mode when a valid Data load Request is received from the Data Load Application on the CAN bus.

Additional Information: A valid data load request is the Upload request. Refer to section 3.8 for more details on the data loading requirements.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-41447

The CDP data-load software shall comply with the requirements of ABD0100 g2-1.4 specified as applicable and V42SP0806471.

Note: V42SP0806471 describes the Detailed Functional Specification for CAN Data Loading.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Analysis  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## CAN MESSAGE PROCESSING FUNCTION

ID:CDP-CIRD-41451

The CDP **shall** receive messages from all the Control Panels, PDUs and CPIOM through CAN bus in accordance with the protocol and definition in CAN ICD Rpt 11594.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

The CDP should implement the CAN interface according to the specifications mentioned in V4230RQ0702729.

### Receive Message Processing

ID:CDP-CIRD-26432

The Cargo Display Panel (CDP) **shall** implement the function identifier field and node identifier field of CAN data frame as specified in CAN-ICD Rpt 11594 for each of the messages outlined below.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-29218

The CDP **shall** identify PDUs and Control Panels location based on "Translated Node ID". Refer CAN ICD Rpt 11594.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-42132

The CDP **shall** receive the following messages via CAN bus and process the messages at the rate mentioned below:

Note: Refer CAN-ICD Rpt 11594

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **MESSAGE NAME** | **UPDATE RATE** |
| CARGO\_ZONE\_ENABLED | 250 ms |
| PANEL\_OPER\_CMD | 250 ms |
| PANEL\_STATUS\_CMD | 250 ms |
| STATUS\_MSG\_1 | 250 ms |
| STATUS\_MSG\_2 | 250 ms |
| STATUS\_MSG\_3 | 250 ms |
| PREPARE | 250 ms |
| MOVE | 250ms |
| RETRACT | 250 ms |

Table - CAN MESSAGES RECEIVED

#### CARGO\_ZONE\_ENABLED

ID:CDP-CIRD-26434

The CDP **shall** receive the **CARGO\_ZONE\_ENABLED** message computed at CPIOM via CAN bus with the following signals:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |
| --- |
| **Signal\_Name** |
| Access\_Zone\_1\_Enabled |
| Access\_Zone\_2\_Enabled |
| Access\_Zone\_3\_Enabled |
| Access\_Zone\_4\_Enabled |
| Access\_Zone\_5\_Enabled |
| Access\_Zone\_6\_Enabled |
| Access\_Zone\_7\_Enabled |
| Access\_Zone\_8\_Enabled |
| Access\_Zone\_9\_Enabled |
| Access\_Zone\_10\_Enabled |
| Access\_Zone\_11\_Enabled |
| Access\_Zone\_12\_Enabled |
| Access\_Zone\_13\_Enabled |
| Access\_Zone\_14\_Enabled |
| Access\_Zone\_15\_Enabled |
| Access\_Zone\_16\_Enabled |
| Access\_Zone\_17\_Enabled |
| Access\_Zone\_18\_Enabled |
| Access\_Zone\_19\_Enabled |
| Access\_Zone\_20\_Enabled |
| Access\_Zone\_21\_Enabled |
| Access\_Zone\_22\_Enabled |
| Access\_Zone\_23\_Enabled |
| Access\_Zone\_24\_Enabled |
| Access\_Zone\_25\_Enabled |
| Access\_Zone\_26\_Enabled |
| Access\_Zone\_27\_Enabled |
| Access\_Zone\_28\_Enabled |
| Access\_Zone\_29\_Enabled |

Table - Cargo\_Zone\_Enabled

#### Control Panel Redirected Messages

##### PANEL\_STATUS\_CMD

###### Master Control Panel (MCP)

ID:CDP-CIRD-26438

The CDP **shall** receive the redirected MCP PANEL\_STATUS\_CMD message via CAN bus from CPIOM, with the signals identified in below table in column "PANEL\_STATUS\_CMD from CPIOM to MCP" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_STATUS\_CMD from CPIOM to MCP** | **CDP Signal Mapping** |
| LED\_System\_Active | MCP\_LED\_System\_Active |
| PB\_On\_Off\_LED | MCP\_PB\_On\_Off\_LED |
| PB\_Zone\_Select\_AFT\_LED | MCP\_PB\_Zone\_Select\_AFT\_LED |
| PB\_Zone\_Select\_FWD\_LED | MCP\_PB\_Zone\_Select\_FWD\_LED |
| PB\_Side\_Select\_Left\_LED | MCP\_PB\_Side\_Select\_Left\_LED |
| PB\_Side\_Select\_Right\_LED | MCP\_PB\_Side\_Select\_Right\_LED |
| PB\_Dual\_Operator\_LED | MCP\_PB\_Dual\_Operator\_LED |
| PB\_20FT\_LED | MCP\_PB\_20FT\_LED |
| PB\_LCP\_LH2\_1\_Enable\_LED | MCP\_PB\_LCP\_LH2\_1\_Enable\_LED |
| PB\_LCP\_LH4\_3\_Enable\_LED | MCP\_PB\_LCP\_LH4\_3\_Enable\_LED |
| PB\_LCP\_RH2\_1\_Enable\_LED | MCP\_PB\_LCP\_RH2\_1\_Enable\_LED |
| PB\_LCP\_RH4\_3\_Enable\_LED | MCP\_PB\_LCP\_RH4\_3\_Enable\_LED |
| PB\_Spin\_LED | MCP\_PB\_Spin\_LED |

Table - Redirected MCP Panel\_Status\_Cmd

###### Outside Control Panel (OCP)

ID:CDP-CIRD-26440

The CDP **shall** receive the redirected OCP PANEL\_STATUS\_CMD message via CAN bus from CPIOM, with the signals identified in below table in column "PANEL\_STATUS\_CMD from CPIOM to OCP" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_STATUS\_CMD from CPIOM to OCP** | **CDP Signal Mapping** |
| LED\_System\_Active | OCP\_LED\_System\_Active |
| PB\_On\_Off\_LED | OCP\_PB\_On\_Off\_LED |
| PB\_Side\_Select\_Left\_LED | OCP\_PB\_Side\_Select\_Left\_LED |
| PB\_Side\_Select\_Right\_LED | OCP\_PB\_Side\_Select\_Right\_LED |
| PB\_Zone\_Select\_AFT\_LED | OCP\_PB\_Zone\_Select\_AFT\_LED |
| PB\_Zone\_Select\_FWD\_LED | OCP\_PB\_Zone\_Select\_FWD\_LED |
| PB\_Dual\_Operator\_LED | OCP\_PB\_Dual\_Operator\_LED |
| PB\_20FT\_LED | OCP\_PB\_20FT\_LED |

Table - Redirected OCP Panel\_Status\_Cmd

###### Inside Control Panel (ICP)

ID:CDP-CIRD-26442

The CDP **shall** receive the redirected ICP PANEL\_STATUS\_CMD message via CAN bus from CPIOM, with the signals identified in below table in column "PANEL\_STATUS\_CMD from CPIOM to ICP" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_STATUS\_CMD from CPIOM to ICP** | **CDP Signal Mapping** |
| LED\_System\_Active | ICP\_LED\_System\_Active |
| PB\_On\_Off\_LED | ICP\_PB\_On\_Off\_LED |
| PB\_Zone\_Select\_AFT\_LED | ICP\_PB\_Zone\_Select\_AFT\_LED |
| PB\_Zone\_Select\_FWD\_LED | ICP\_PB\_Zone\_Select\_FWD\_LED |
| PB\_Side\_Select\_Left\_LED | ICP\_PB\_Side\_Select\_Left\_LED |
| PB\_Side\_Select\_Right\_LED | ICP\_PB\_Side\_Select\_Right\_LED |
| PB\_Dual\_Operator\_LED | ICP\_PB\_Dual\_Operator\_LED |
| PB\_20FT\_LED | ICP\_PB\_20FT\_LED |
| PB\_LCP\_LH2\_1\_Enable\_LED | ICP\_PB\_LCP\_LH2\_1\_Enable\_LED |
| PB\_LCP\_LH4\_3\_Enable\_LED | ICP\_PB\_LCP\_LH4\_3\_Enable\_LED |
| PB\_LCP\_RH2\_1\_Enable\_LED | ICP\_PB\_LCP\_RH2\_1\_Enable\_LED |
| PB\_LCP\_RH4\_3\_Enable\_LED | ICP\_PB\_LCP\_RH4\_3\_Enable\_LED |
| PB\_Spin\_LED | ICP\_PB\_Spin\_LED |

Table - Redirected ICP Panel\_Status\_Cmd

###### Local Control Panel (LCP)

ID:CDP-CIRD-26444

The CDP **shall** receive the redirected LCP PANEL\_STATUS\_CMD message via CAN bus from CPIOM, with the signals identified in below table in column "PANEL\_STATUS\_CMD from CPIOM to LCP X" and assigned to the signal names mentioned in column "CDP Signal Mapping":

Note: "X" corresponds to any of 1 LH , 2 LH, 3 LH, 4 LH, 1 RH, 2 RH, 3 RH, 4 RH.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_STATUS\_CMD from CPIOM to LCP1 LH** | **CDP Signal Mapping** |
| LED\_Panel\_Enabled | LCP1LH\_LED\_Panel\_Enabled |
| PB\_Dual\_Lane | LCP1LH\_PB\_Dual\_Lane\_LED |
| PB\_Unlock\_Next | LCP1LH\_PB\_Unlock\_Next\_LED |
|  |  |
| **PANEL\_STATUS\_CMD from CPIOM to LCP2 LH** | **CDP Signal Mapping** |
| LED\_Panel\_Enabled | LCP2LH\_LED\_Panel\_Enabled |
| PB\_Dual\_Lane | LCP2LH\_PB\_Dual\_Lane\_LED |
| PB\_Unlock\_Next | LCP2LH\_PB\_Unlock\_Next\_LED |
|  |  |
| **PANEL\_STATUS\_CMD from CPIOM to LCP3 LH** | **CDP Signal Mapping** |
| LED\_Panel\_Enabled | LCP3LH\_LED\_Panel\_Enabled |
| PB\_Dual\_Lane | LCP3LH\_PB\_Dual\_Lane\_LED |
| PB\_Unlock\_Next | LCP3LH\_PB\_Unlock\_Next\_LED |
|  |  |
| **PANEL\_STATUS\_CMD from CPIOM to LCP4 LH** | **CDP Signal Mapping** |
| LED\_Panel\_Enabled | LCP4LH\_LED\_Panel\_Enabled |
| PB\_Dual\_Lane | LCP4LH\_PB\_Dual\_Lane\_LED |
| PB\_Unlock\_Next | LCP4LH\_PB\_Unlock\_Next\_LED |
|  |  |
| **PANEL\_STATUS\_CMD from CPIOM to LCP1 RH** | **CDP Signal Mapping** |
| LED\_Panel\_Enabled | LCP1RH\_LED\_Panel\_Enabled |
| PB\_Dual\_Lane | LCP1RH\_PB\_Dual\_Lane\_LED |
| PB\_Unlock\_Next | LCP1RH\_PB\_Unlock\_Next\_LED |
|  |  |
| **PANEL\_STATUS\_CMD from CPIOM to LCP2 RH** | **CDP Signal Mapping** |
| LED\_Panel\_Enabled | LCP2RH\_LED\_Panel\_Enabled |
| PB\_Dual\_Lane | LCP2RH\_PB\_Dual\_Lane\_LED |
| PB\_Unlock\_Next | LCP2RH\_PB\_Unlock\_Next\_LED |
|  |  |
| **PANEL\_STATUS\_CMD from CPIOM to LCP3 RH** | **CDP Signal Mapping** |
| LED\_Panel\_Enabled | LCP3RH\_LED\_Panel\_Enabled |
| PB\_Dual\_Lane | LCP3RH\_PB\_Dual\_Lane\_LED |
| PB\_Unlock\_Next | LCP3RH\_PB\_Unlock\_Next\_LED |
|  |  |
| **PANEL\_STATUS\_CMD from CPIOM to LCP4 RH** | **CDP Signal Mapping** |
| LED\_Panel\_Enabled | LCP4RH\_LED\_Panel\_Enabled |
| PB\_Dual\_Lane | LCP4RH\_PB\_Dual\_Lane\_LED |
| PB\_Unlock\_Next | LCP4RH\_PB\_Unlock\_Next\_LED |

Table - Redirected LCP Panel\_Status\_Cmd

##### PANEL\_OPER\_CMD

###### Master Control Panel

ID:CDP-CIRD-26447

The CDP **shall** receive the redirected MCP PANEL\_OPER\_CMD message via CAN bus from MCP, with the signals identified in below table in column "PANEL\_OPER\_CMD from MCP" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_OPER\_CMD from MCP** | **CDP Signal Mapping** |
| PB\_Power\_On\_Off | MCP\_PB\_Power\_On\_Off |
| PB\_PDU\_Stop | MCP\_PB\_PDU\_Stop |
| PB\_Side\_Select\_Left | MCP\_PB\_Side\_Select\_Left |
| PB\_Side\_Select\_Right | MCP\_PB\_Side\_Select\_Right |
| PB\_Zone\_Select\_AFT | MCP\_PB\_Zone\_Select\_AFT |
| PB\_Zone\_Select\_FWD | MCP\_PB\_Zone\_Select\_FWD |
| PB\_LCP\_LH2\_1\_Enable | MCP\_PB\_LCP\_LH2\_1\_Enable |
| PB\_LCP\_LH4\_3\_Enable | MCP\_PB\_LCP\_LH4\_3\_Enable |
| PB\_LCP\_RH2\_1\_Enable | MCP\_PB\_LCP\_RH2\_1\_Enable |
| PB\_LCP\_RH4\_3\_Enable | MCP\_PB\_LCP\_RH4\_3\_Enable |
| PB\_Dual\_Operator | MCP\_PB\_Dual\_Operator |
| PB\_20FT | MCP\_PB\_20FT |
| Joystick\_AFT | MCP\_Joystick\_AFT |
| Joystick\_FWD | MCP\_Joystick\_FWD |
| Joystick\_IN | MCP\_Joystick\_IN |
| Joystick\_OUT | MCP\_Joystick\_OUT |
| Joystick\_NEUTRAL | MCP\_Joystick\_NEUTRAL |
| TGLS\_20FT\_OUT | MCP\_TGLS\_20FT\_OUT |
| TGLS\_20FT\_IN | MCP\_TGLS\_20FT\_IN |
| PB\_Spin | MCP\_PB\_Spin |
| Switch\_Fault\_Status | MCP\_Switch\_Fault\_Status |
| PB\_Power\_On\_Off\_Fault | MCP\_PB\_Power\_On\_Off\_Fault |
| PB\_PDU\_Stop\_Fault | MCP\_PB\_PDU\_Stop\_Fault |
| PB\_Side\_Select\_Left\_Fault | MCP\_PB\_Side\_Select\_Left\_Fault |
| PB\_Side\_Select\_Right\_Fault | MCP\_PB\_Side\_Select\_Right\_Fault |
| PB\_Zone\_Select\_AFT\_Fault | MCP\_PB\_Zone\_Select\_AFT\_Fault |
| PB\_Zone\_Select\_FWD\_Fault | MCP\_PB\_Zone\_Select\_FWD\_Fault |
| PB\_LCP\_LH2\_1\_Enable\_Fault | MCP\_PB\_LCP\_LH2\_1\_Enable\_Fault |
| PB\_LCP\_LH4\_3\_Enable\_Fault | MCP\_PB\_LCP\_LH4\_3\_Enable\_Fault |
| PB\_LCP\_RH2\_1\_Enable\_Fault | MCP\_PB\_LCP\_RH2\_1\_Enable\_Fault |
| PB\_LCP\_RH4\_3\_Enable\_Fault | MCP\_PB\_LCP\_RH4\_3\_Enable\_Fault |
| PB\_Dual\_Operator\_Fault | MCP\_PB\_Dual\_Operator\_Fault |
| PB\_20FT\_Fault | MCP\_PB\_20FT\_Fault |
| Joystick\_Fault | MCP\_Joystick\_Fault |
| TGLS\_20FT\_Fault | MCP\_TGLS\_20FT\_Fault |
| PB\_Spin\_Fault | MCP\_PB\_Spin\_Fault |
| PB\_Lamp\_Test\_Fault | MCP\_PB\_Lamp\_Test\_Fault |
| LED\_System\_Active\_Fault | MCP\_LED\_System\_Active\_Fault |
| Mux\_Current\_Voltage | MCP\_Mux\_Current\_Voltage |
| Panel\_Status | MCP\_Panel\_Status |
| Measured\_Current\_Voltage | MCP\_Measured\_Current\_Voltage |

Table - Redirected MCP Panel\_Oper\_Cmd

###### Outside Control Panel

ID:CDP-CIRD-26449

The CDP **shall** receive the redirected OCP PANEL\_OPER\_CMD message via CAN bus from OCP, with the signals identified in below table in column "PANEL\_OPER\_CMD from OCP" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_OPER\_CMD from OCP** | **CDP Signal Mapping** |
| PB\_Power\_On\_Off | OCP\_PB\_Power\_On\_Off |
| PB\_PDU\_Stop | OCP\_PB\_PDU\_Stop |
| PB\_Side\_Select\_Left | OCP\_PB\_Side\_Select\_Left |
| PB\_Side\_Select\_Right | OCP\_PB\_Side\_Select\_Right |
| PB\_Zone\_Select\_AFT | OCP\_PB\_Zone\_Select\_AFT |
| PB\_Zone\_Select\_FWD | OCP\_PB\_Zone\_Select\_FWD |
| TGLS\_20FT\_ IN | OCP\_TGLS\_20FT\_ IN |
| TGLS\_20FT\_OUT | OCP\_TGLS\_20FT\_OUT |
| PB\_Dual\_Operator | OCP\_PB\_Dual\_Operator |
| PB\_20FT | OCP\_PB\_20FT |
| TGLS\_IN\_OUT\_IN | OCP\_TGLS\_IN\_OUT\_IN |
| TGLS\_IN\_OUT\_OUT | OCP\_TGLS\_IN\_OUT\_OUT |
| TGLS\_L\_R\_FWD | OCP\_TGLS\_L\_R\_FWD |
| TGLS\_L\_R\_AFT | OCP\_TGLS\_L\_R\_AFT |
| Switch\_Fault\_Status | OCP\_Switch\_Fault\_Status |
| PB\_Power\_On\_Off\_Fault | OCP\_PB\_Power\_On\_Off\_Fault |
| PB\_PDU\_Stop\_Fault | OCP\_PB\_PDU\_Stop\_Fault |
| PB\_Side\_Select\_Left\_Fault | OCP\_PB\_Side\_Select\_Left\_Fault |
| PB\_Side\_Select\_Right\_Fault | OCP\_PB\_Side\_Select\_Right\_Fault |
| PB\_Zone\_Select\_AFT\_Fault | OCP\_PB\_Zone\_Select\_AFT\_Fault |
| PB\_Zone\_Select\_FWD\_Fault | OCP\_PB\_Zone\_Select\_FWD\_Fault |
| TGLS\_20FT\_Fault | OCP\_TGLS\_20FT\_Fault |
| PB\_Dual\_Operator\_Fault | OCP\_PB\_Dual\_Operator\_Fault |
| PB\_20FT\_Fault | OCP\_PB\_20FT\_Fault |
| TGLS\_IN\_OUT\_Fault | OCP\_TGLS\_IN\_OUT\_Fault |
| TGLS\_L\_R\_Fault | OCP\_TGLS\_L\_R\_Fault |
| PB\_Lamp\_Test\_Fault | OCP\_PB\_Lamp\_Test\_Fault |
| LED\_System\_Active\_Fault | OCP\_LED\_System\_Active\_Fault |
| Panel\_Status | OCP\_Panel\_Status |
| Mux\_Current\_Voltage | OCP\_Mux\_Current\_Voltage |
| Measured\_Current\_Voltage | OCP\_Measured\_Current\_Voltage |
|  |  |

Table - Redirected OCP Panel\_Oper\_Cmd

###### Inside Control Panel

ID:CDP-CIRD-26451

The CDP **shall** receive the redirected ICP PANEL\_OPER\_CMD message via CAN bus from ICP, with the signals identified in below table in column "PANEL\_OPER\_CMD from ICP" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_OPER\_CMD from ICP** | **CDP Signal Mapping** |
| PB\_Power\_On\_Off | ICP\_PB\_Power\_On\_Off |
| PB\_PDU\_Stop | ICP\_PB\_PDU\_Stop |
| PB\_Side\_Select\_Left | ICP\_PB\_Side\_Select\_Left |
| PB\_Side\_Select\_Right | ICP\_PB\_Side\_Select\_Right |
| PB\_Zone\_Select\_AFT | ICP\_PB\_Zone\_Select\_AFT |
| PB\_Zone\_Select\_FWD | ICP\_PB\_Zone\_Select\_FWD |
| PB\_LCP\_LH2\_1\_Enable | ICP\_PB\_LCP\_LH2\_1\_Enable |
| PB\_LCP\_LH4\_3\_Enable | ICP\_PB\_LCP\_LH4\_3\_Enable |
| PB\_LCP\_RH2\_1\_Enable | ICP\_PB\_LCP\_RH2\_1\_Enable |
| PB\_LCP\_RH4\_3\_Enable | ICP\_PB\_LCP\_RH4\_3\_Enable |
| PB\_Dual\_Operator | ICP\_PB\_Dual\_Operator |
| PB\_20FT | ICP\_PB\_20FT |
| Joystick\_AFT | ICP\_Joystick\_AFT |
| Joystick\_FWD | ICP\_Joystick\_FWD |
| Joystick\_IN | ICP\_Joystick\_IN |
| Joystick\_OUT | ICP\_Joystick\_OUT |
| Joystick\_NEUTRAL | ICP\_Joystick\_NEUTRAL |
| TGLS\_20FT\_OUT | ICP\_TGLS\_20FT\_OUT |
| TGLS\_20FT\_IN | ICP\_TGLS\_20FT\_IN |
| PB\_Spin | ICP\_PB\_Spin |
| Switch\_Fault\_Status | ICP\_Switch\_Fault\_Status |
| PB\_Power\_On\_Off\_Fault | ICP\_PB\_Power\_On\_Off\_Fault |
| PB\_PDU\_Stop\_Fault | ICP\_PB\_PDU\_Stop\_Fault |
| PB\_Side\_Select\_Left\_Fault | ICP\_PB\_Side\_Select\_Left\_Fault |
| PB\_Side\_Select\_Right\_Fault | ICP\_PB\_Side\_Select\_Right\_Fault |
| PB\_Zone\_Select\_AFT\_Fault | ICP\_PB\_Zone\_Select\_AFT\_Fault |
| PB\_Zone\_Select\_FWD\_Fault | ICP\_PB\_Zone\_Select\_FWD\_Fault |
| PB\_LCP\_LH2\_1\_Enable\_Fault | ICP\_PB\_LCP\_LH2\_1\_Enable\_Fault |
| PB\_LCP\_LH4\_3\_Enable\_Fault | ICP\_PB\_LCP\_LH4\_3\_Enable\_Fault |
| PB\_LCP\_RH2\_1\_Enable\_Fault | ICP\_PB\_LCP\_RH2\_1\_Enable\_Fault |
| PB\_LCP\_RH4\_3\_Enable\_Fault | ICP\_PB\_LCP\_RH4\_3\_Enable\_Fault |
| PB\_Dual\_Operator\_Fault | ICP\_PB\_Dual\_Operator\_Fault |
| PB\_20FT\_Fault | ICP\_PB\_20FT\_Fault |
| Joystick\_Fault | ICP\_Joystick\_Fault |
| TGLS\_20FT\_Fault | ICP\_TGLS\_20FT\_Fault |
| PB\_Spin\_Fault | ICP\_PB\_Spin\_Fault |
| PB\_Lamp\_Test\_Fault | ICP\_PB\_Lamp\_Test\_Fault |
| LED\_System\_Active\_Fault | ICP\_LED\_System\_Active\_Fault |
| Mux\_Current\_Voltage | ICP\_Mux\_Current\_Voltage |
| Panel\_Status | ICP\_Panel\_Status |
| Measured\_Current\_Voltage | ICP\_Measured\_Current\_Voltage |

Table - Redirected ICP Panel\_Oper\_Cmd

###### Local Control Panel

ID:CDP-CIRD-26453

The CDP **shall** receive the redirected LCP X PANEL\_OPER\_CMD message (where X is one of LCP1LH, LCP2LH, LCP3LH, LCP1RH, LCP2RH and LCP3RH) via CAN bus from the LCPs with the signals identified in below table in column "PANEL\_OPER\_CMD from LCP X" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_OPER\_CMD from LCP 1 LH** | **CDP Signal Mapping** |
| PB\_PDU\_Stop | LCP1LH\_PB\_PDU\_Stop |
| TGLS\_Drive\_FWD | LCP1LH\_TGLS\_Drive\_FWD |
| TGLS\_Drive\_AFT | LCP1LH\_TGLS\_Drive\_AFT |
| PB\_Dual\_Lane | LCP1LH\_PB\_Dual\_Lane |
| PB\_Unlock\_Next | LCP1LH\_PB\_Unlock\_Next |
| Switch\_Fault\_Status | LCP1LH\_Switch\_Fault\_Status |
| PB\_PDU\_Stop\_Fault | LCP1LH\_PB\_PDU\_Stop\_Fault |
| TGLS\_Drive\_Fault | LCP1LH\_TGLS\_Drive\_Fault |
| PB\_Dual\_Lane\_Fault | LCP1LH\_PB\_Dual\_Lane\_Fault |
| PB\_Unlock\_Next\_Fault | LCP1LH\_PB\_Unlock\_Next\_Fault |
| PB\_Lamp\_Test\_Fault | LCP1LH\_PB\_Lamp\_Test\_Fault |
| LED\_Panel\_Enabled\_Fault | LCP1LH\_LED\_Panel\_Enabled\_Fault |
| Panel\_Status | LCP1LH\_Panel\_Status |
| Mux\_Current\_Voltage | LCP1LH\_Mux\_Current\_Voltage |
| Measured\_Current\_Voltage | LCP1LH\_Measured\_Current\_Voltage |
|  |  |
| **PANEL\_OPER\_CMD from LCP 1 RH** | **CDP Signal Mapping** |
| PB\_PDU\_Stop | LCP1RH\_PB\_PDU\_Stop |
| TGLS\_Drive\_FWD | LCP1RH\_TGLS\_Drive\_FWD |
| TGLS\_Drive\_AFT | LCP1RH\_TGLS\_Drive\_AFT |
| PB\_Dual\_Lane | LCP1RH\_PB\_Dual\_Lane |
| PB\_Unlock\_Next | LCP1RH\_PB\_Unlock\_Next |
| Switch\_Fault\_Status | LCP1RH\_Switch\_Fault\_Status |
| PB\_PDU\_Stop\_Fault | LCP1RH\_PB\_PDU\_Stop\_Fault |
| TGLS\_Drive\_Fault | LCP1RH\_TGLS\_Drive\_Fault |
| PB\_Dual\_Lane\_Fault | LCP1RH\_PB\_Dual\_Lane\_Fault |
| PB\_Unlock\_Next\_Fault | LCP1RH\_PB\_Unlock\_Next\_Fault |
| PB\_Lamp\_Test\_Fault | LCP1RH\_PB\_Lamp\_Test\_Fault |
| LED\_Panel\_Enabled\_Fault | LCP1RH\_LED\_Panel\_Enabled\_Fault |
| Panel\_Status | LCP1RH\_Panel\_Status |
| Mux\_Current\_Voltage | LCP1RH\_Mux\_Current\_Voltage |
| Measured\_Current\_Voltage | LCP1RH\_Measured\_Current\_Voltage |
|  |  |
| **PANEL\_OPER\_CMD from LCP 2 LH** | **CDP Signal Mapping** |
| PB\_PDU\_Stop | LCP2LH\_PB\_PDU\_Stop |
| TGLS\_Drive\_FWD | LCP2LH\_TGLS\_Drive\_FWD |
| TGLS\_Drive\_AFT | LCP2LH\_TGLS\_Drive\_AFT |
| PB\_Dual\_Lane | LCP2LH\_PB\_Dual\_Lane |
| PB\_Unlock\_Next | LCP2LH\_PB\_Unlock\_Next |
| Switch\_Fault\_Status | LCP2LH\_Switch\_Fault\_Status |
| PB\_PDU\_Stop\_Fault | LCP2LH\_PB\_PDU\_Stop\_Fault |
| TGLS\_Drive\_Fault | LCP2LH\_TGLS\_Drive\_Fault |
| PB\_Dual\_Lane\_Fault | LCP2LH\_PB\_Dual\_Lane\_Fault |
| PB\_Unlock\_Next\_Fault | LCP2LH\_PB\_Unlock\_Next\_Fault |
| PB\_Lamp\_Test\_Fault | LCP2LH\_PB\_Lamp\_Test\_Fault |
| LED\_Panel\_Enabled\_Fault | LCP2LH\_LED\_Panel\_Enabled\_Fault |
| Panel\_Status | LCP2LH\_Panel\_Status |
| Mux\_Current\_Voltage | LCP2LH\_Mux\_Current\_Voltage |
| Measured\_Current\_Voltage | LCP2LH\_Measured\_Current\_Voltage |
|  |  |
| **PANEL\_OPER\_CMD from LCP 2 RH** | **CDP Signal Mapping** |
| PB\_PDU\_Stop | LCP2RH\_PB\_PDU\_Stop |
| TGLS\_Drive\_FWD | LCP2RH\_TGLS\_Drive\_FWD |
| TGLS\_Drive\_AFT | LCP2RH\_TGLS\_Drive\_AFT |
| PB\_Dual\_Lane | LCP2RH\_PB\_Dual\_Lane |
| PB\_Unlock\_Next | LCP2RH\_PB\_Unlock\_Next |
| Switch\_Fault\_Status | LCP2RH\_Switch\_Fault\_Status |
| PB\_PDU\_Stop\_Fault | LCP2RH\_PB\_PDU\_Stop\_Fault |
| TGLS\_Drive\_Fault | LCP2RH\_TGLS\_Drive\_Fault |
| PB\_Dual\_Lane\_Fault | LCP2RH\_PB\_Dual\_Lane\_Fault |
| PB\_Unlock\_Next\_Fault | LCP2RH\_PB\_Unlock\_Next\_Fault |
| PB\_Lamp\_Test\_Fault | LCP2RH\_PB\_Lamp\_Test\_Fault |
| LED\_Panel\_Enabled\_Fault | LCP2RH\_LED\_Panel\_Enabled\_Fault |
| Panel\_Status | LCP2RH\_Panel\_Status |
| Mux\_Current\_Voltage | LCP2RH\_Mux\_Current\_Voltage |
| Measured\_Current\_Voltage | LCP2RH\_Measured\_Current\_Voltage |
|  |  |
| **PANEL\_OPER\_CMD from LCP 3 LH** | **CDP Signal Mapping** |
| PB\_PDU\_Stop | LCP3LH\_PB\_PDU\_Stop |
| TGLS\_Drive\_FWD | LCP3LH\_TGLS\_Drive\_FWD |
| TGLS\_Drive\_AFT | LCP3LH\_TGLS\_Drive\_AFT |
| PB\_Dual\_Lane | LCP3LH\_PB\_Dual\_Lane |
| PB\_Unlock\_Next | LCP3LH\_PB\_Unlock\_Next |
| Switch\_Fault\_Status | LCP3LH\_Switch\_Fault\_Status |
| PB\_PDU\_Stop\_Fault | LCP3LH\_PB\_PDU\_Stop\_Fault |
| TGLS\_Drive\_Fault | LCP3LH\_TGLS\_Drive\_Fault |
| PB\_Dual\_Lane\_Fault | LCP3LH\_PB\_Dual\_Lane\_Fault |
| PB\_Unlock\_Next\_Fault | LCP3LH\_PB\_Unlock\_Next\_Fault |
| PB\_Lamp\_Test\_Fault | LCP3LH\_PB\_Lamp\_Test\_Fault |
| LED\_Panel\_Enabled\_Fault | LCP3LH\_LED\_Panel\_Enabled\_Fault |
| Panel\_Status | LCP3LH\_Panel\_Status |
| Mux\_Current\_Voltage | LCP3LH\_Mux\_Current\_Voltage |
| Measured\_Current\_Voltage | LCP3LH\_Measured\_Current\_Voltage |
|  |  |
| **PANEL\_OPER\_CMD from LCP 3 RH** | **CDP Signal Mapping** |
| PB\_PDU\_Stop | LCP3RH\_PB\_PDU\_Stop |
| TGLS\_Drive\_FWD | LCP3RH\_TGLS\_Drive\_FWD |
| TGLS\_Drive\_AFT | LCP3RH\_TGLS\_Drive\_AFT |
| PB\_Dual\_Lane | LCP3RH\_PB\_Dual\_Lane |
| PB\_Unlock\_Next | LCP3RH\_PB\_Unlock\_Next |
| Switch\_Fault\_Status | LCP3RH\_Switch\_Fault\_Status |
| PB\_PDU\_Stop\_Fault | LCP3RH\_PB\_PDU\_Stop\_Fault |
| TGLS\_Drive\_Fault | LCP3RH\_TGLS\_Drive\_Fault |
| PB\_Dual\_Lane\_Fault | LCP3RH\_PB\_Dual\_Lane\_Fault |
| PB\_Unlock\_Next\_Fault | LCP3RH\_PB\_Unlock\_Next\_Fault |
| PB\_Lamp\_Test\_Fault | LCP3RH\_PB\_Lamp\_Test\_Fault |
| LED\_Panel\_Enabled\_Fault | LCP3RH\_LED\_Panel\_Enabled\_Fault |
| Panel\_Status | LCP3RH\_Panel\_Status |
| Mux\_Current\_Voltage | LCP3RH\_Mux\_Current\_Voltage |
| Measured\_Current\_Voltage | LCP3RH\_Measured\_Current\_Voltage |

Table - Redirected LCP Panel\_Oper\_Cmd [LCP 1/2/3]

###### Local Control Panel (20 FT)

ID:CDP-CIRD-26455

The CDP **shall** receive the redirected LCP 4LH/RH PANEL\_OPER\_CMD message via CAN bus from the LCPs with the signals identified in below table in column "PANEL\_OPER\_CMD from LCP X" and assigned to the signal names mentioned in column "CDP Signal Mapping":

Note: "X" may be any of 4 LH or 4 RH

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PANEL\_OPER\_CMD from LCP 4LH** | **CDP Signal Mapping** |
| PB\_PDU\_Stop | LCP4LH\_PB\_PDU\_Stop |
| TGLS\_Drive\_FWD | LCP4LH\_TGLS\_Drive\_FWD |
| TGLS\_Drive\_AFT | LCP4LH\_TGLS\_Drive\_AFT |
| TGLS\_L\_R\_LEFT | LCP4LH\_TGLS\_L\_R\_LEFT |
| TGLS\_L\_R\_RIGHT | LCP4LH\_TGLS\_L\_R\_RIGHT |
| TGLS\_20FT\_IN | LCP4LH\_TGLS\_20FT\_IN |
| TGLS\_20FT\_OUT | LCP4LH\_TGLS\_20FT\_OUT |
| PB\_Dual\_Lane | LCP4LH\_PB\_Dual\_Lane |
| PB\_Unlock\_Next | LCP4LH\_PB\_Unlock\_Next |
| Switch\_Fault\_Status | LCP4LH\_Switch\_Fault\_Status |
| PB\_PDU\_Stop\_Fault | LCP4LH\_PB\_PDU\_Stop\_Fault |
| TGLS\_Drive\_Fault | LCP4LH\_TGLS\_Drive\_Fault |
| TGLS\_L\_R\_Fault | LCP4LH\_TGLS\_L\_R\_Fault |
| TGLS\_20FT\_Fault | LCP4LH\_TGLS\_20FT\_Fault |
| PB\_Dual\_Lane\_Fault | LCP4LH\_PB\_Dual\_Lane\_Fault |
| PB\_Unlock\_Next\_Fault | LCP4LH\_PB\_Unlock\_Next\_Fault |
| PB\_Lamp\_Test\_Fault | LCP4LH\_PB\_Lamp\_Test\_Fault |
| LED\_Panel\_Enabled\_Fault | LCP4LH\_LED\_Panel\_Enabled\_Fault |
| Mux\_Current\_Voltage | LCP4LH\_Mux\_Current\_Voltage |
| Panel\_Status | LCP4LH\_Panel\_Status |
| Measured\_Current\_Voltage | LCP4LH\_Measured\_Current\_Voltage |
|  |  |
| **PANEL\_OPER\_CMD from LCP 4RH** | **CDP Signal Mapping** |
| PB\_PDU\_Stop | LCP4RH\_PB\_PDU\_Stop |
| TGLS\_Drive\_FWD | LCP4RH\_TGLS\_Drive\_FWD |
| TGLS\_Drive\_AFT | LCP4RH\_TGLS\_Drive\_AFT |
| TGLS\_L\_R\_LEFT | LCP4RH\_TGLS\_L\_R\_LEFT |
| TGLS\_L\_R\_RIGHT | LCP4RH\_TGLS\_L\_R\_RIGHT |
| TGLS\_20FT\_IN | LCP4RH\_TGLS\_20FT\_IN |
| TGLS\_20FT\_OUT | LCP4RH\_TGLS\_20FT\_OUT |
| PB\_Dual\_Lane | LCP4RH\_PB\_Dual\_Lane |
| PB\_Unlock\_Next | LCP4RH\_PB\_Unlock\_Next |
| Switch\_Fault\_Status | LCP4RH\_Switch\_Fault\_Status |
| PB\_PDU\_Stop\_Fault | LCP4RH\_PB\_PDU\_Stop\_Fault |
| TGLS\_Drive\_Fault | LCP4RH\_TGLS\_Drive\_Fault |
| TGLS\_L\_R\_Fault | LCP4RH\_TGLS\_L\_R\_Fault |
| TGLS\_20FT\_Fault | LCP4RH\_TGLS\_20FT\_Fault |
| PB\_Dual\_Lane\_Fault | LCP4RH\_PB\_Dual\_Lane\_Fault |
| PB\_Unlock\_Next\_Fault | LCP4RH\_PB\_Unlock\_Next\_Fault |
| PB\_Lamp\_Test\_Fault | LCP4RH\_PB\_Lamp\_Test\_Fault |
| LED\_Panel\_Enabled\_Fault | LCP4RH\_LED\_Panel\_Enabled\_Fault |
| Mux\_Current\_Voltage | LCP4RH\_Mux\_Current\_Voltage |
| Panel\_Status | LCP4RH\_Panel\_Status |
| Measured\_Current\_Voltage | LCP4RH\_Measured\_Current\_Voltage |

Table - Redirected LCP 4 Panel\_Oper\_Cmd

#### Power Drive Units (PDUs) Redirected Messages

##### PREPARE

ID:CDP-CIRD-26458

The CDP **shall** receive the redirected PDU **PREPARE** message via CAN bus from CPIOM with the signals identified in below table in column "PREPARE Signal from CPIOM to PDU" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PREPARE Signal from CPIOM to PDU** | **CDP Signal Mapping** |
| Command\_Identification\_Code | Prepare\_PDU\_X\_Command\_Identification\_Code |
| Direction\_Velocity | Prepare\_PDU\_X\_Direction\_Velocity |
| Group\_Identifier | Prepare\_PDU\_X\_Group\_Identifier |
| Expiry\_Time | Prepare\_PDU\_X\_Expiry\_Time |

Table - Redirected PDU PREPARE

##### MOVE

ID:CDP-CIRD-26460

The CDP **shall** receive the redirected PDU MOVE message via CAN bus from CPIOM with the signals identified in below table in column "MOVE Signal from CPIOM to PDU" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **MOVE Signal from CPIOM to PDU** | **CDP Signal Mapping** |
| Command\_Identification\_Code | Move\_PDU\_X\_Command\_Identification\_Code |
| Direction\_Velocity | Move\_PDU\_X\_Direction\_Velocity |
| Group\_Identifier | Move\_PDU\_X\_Group\_Identifier |
| Expiry\_Time | Move\_PDU\_X\_Expiry\_Time |

Table - Redirected PDU MOVE

##### RETRACT

ID:CDP-CIRD-26462

The CDP **shall** receive the redirected PDU RETRACT message via CAN bus from CPIOM with the signals identified in below table in column "RETRACT Signal from CPIOM to PDU" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **RETRACT Signal from CPIOM to PDU** | **CDP Signal Mapping** |
| Command\_Identification\_Code | Retract\_PDU\_X\_Command\_Identification\_Code |
| Direction\_Velocity | Retract\_PDU\_X\_Direction\_Velocity |
| Group\_Identifier | Retract\_PDU\_X\_Group\_Identifier |
| Expiry\_Time | Retract\_PDU\_X\_Expiry\_Time |

Table - Redirected PDU RETRACT

##### STATUS\_MSG\_1

ID:CDP-CIRD-26464

The CDP **shall** receive the redirected PDU STATUS\_MSG\_1 message via CAN bus from the PDUs with the signals identified in below table in column "STATUS\_MSG\_1 FROM PDU X" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **STATUS\_MSG\_1 FROM PDU X** | **CDP Signal Mapping** |
| PDU\_Type | PDU\_X\_PDU\_Type |
| PDU\_Health\_Status | PDU\_X\_PDU\_Health\_Status |
| PDU\_Cover\_Status | PDU\_X\_PDU\_Cover\_Status |
| PDU\_Roller\_Position | PDU\_X\_PDU\_Roller\_Position |
| PDU\_Mode | PDU\_X\_PDU\_Mode |
| PDU\_State | PDU\_X\_PDU\_State |
| Drive\_Motor\_Mode | PDU\_X\_Drive\_Motor\_Mode |
| Lift\_Motor\_Mode | PDU\_X\_Lift\_Motor\_Mode |
| Drive\_Motor\_State | PDU\_X\_Drive\_Motor\_State |
| Lift\_Motor\_Control\_Seq\_State | PDU\_X\_Lift\_Motor\_Control\_Seq\_State |
| Lift\_Motor\_State | PDU\_X\_Lift\_Motor\_State |
| Active\_Drive\_Command\_Direction | PDU\_X\_Active\_Drive\_Command\_Direction |
| Hold\_Status | PDU\_X\_Hold\_Status |
| HVDC\_Over\_Voltage\_Fault | PDU\_X\_HVDC\_Over\_Voltage\_Fault |
| HVDC\_Under\_Voltage\_Fault | PDU\_X\_HVDC\_Under\_Voltage\_Fault |
| IGBT\_Protection\_Trip | PDU\_X\_IGBT\_Protection\_Trip |
| Board\_Over\_Temperature\_Fault | PDU\_X\_Board\_Over\_Temperature\_Fault |
| 115VAC\_Phase\_Fault | PDU\_X\_115VAC\_Phase\_Fault |
| Drive\_Motor\_Hall\_Sensor\_State\_Error | PDU\_X\_Drive\_Motor\_Hall\_Sensor\_State\_Error |
| Lift\_Motor\_Hall\_Sensor\_State\_Error | PDU\_X\_Lift\_Motor\_Hall\_Sensor\_State\_Error |
| Drive\_Motor\_State\_Machine\_Error | PDU\_X\_Drive\_Motor\_State\_Machine\_Error |
| Lift\_Motor\_State\_Machine\_Error | PDU\_X\_Lift\_Motor\_State\_Machine\_Error |
| Lift\_Mechanism\_Fault | PDU\_X\_Lift\_Mechanism\_Fault |
| CAN\_Address\_Pin\_Parity\_Fault | PDU\_X\_CAN\_Address\_Pin\_Parity\_Fault |
| Program\_Integrity\_Check\_Fault | PDU\_X\_Program\_Integrity\_Check\_Fault |
| RAM\_Fault | PDU\_X\_RAM\_Fault |
| NVM\_Fault | PDU\_X\_NVM\_Fault |
| HVDC\_Over\_Current\_Fault | PDU\_X\_HVDC\_Over\_Current\_Fault |
| ATRU\_Right\_Coil\_Over\_Temperature\_Fault | PDU\_X\_ATRU\_Right\_Coil\_Over\_Temperature\_Fault |
| ATRU\_Left\_Coil\_Over\_Temperature\_Fault | PDU\_X\_ATRU\_Left\_Coil\_Over\_Temperature\_Fault |
| Drive\_Motor\_Over\_Temperature\_Fault | PDU\_X\_Drive\_Motor\_Over\_Temperature\_Fault |
| IGBT\_Onchip\_Over\_Temperature\_Fault | PDU\_X\_IGBT\_Onchip\_Over\_Temperature\_Fault |
| DM\_Current\_Fault\_Monitoring\_Status | PDU\_X\_DM\_Current\_Fault\_Monitoring\_Status |
| LM\_Current\_Fault\_Monitoring\_Status | PDU\_X\_LM\_Current\_Fault\_Monitoring\_Status |

Table - Redirected PDU STATUS\_MSG\_1

##### STATUS\_MSG\_2

ID:CDP-CIRD-26466

The CDP **shall** receive the redirected PDU STATUS\_MSG\_2 message via CAN bus from the PDUs with the signals identified in below table in column "STATUS\_MSG\_2 FROM PDU X" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **STATUS\_MSG\_2 FROM PDU X** | **CDP Signal Mapping** |
| Current\_Mux | PDU\_X\_Current\_Mux |
| Voltage\_Mux | PDU\_X\_Voltage\_Mux |
| Temperature\_Mux | PDU\_X\_Temperature\_Mux |
| Measured\_Current | PDU\_X\_Measured\_Current |
| Measured\_Voltage | PDU\_X\_Measured\_Voltage |
| Measured\_Temperature | PDU\_X\_Measured\_Temperature |

Table - Redirected PDU STATUS\_MSG\_2

##### STATUS\_MSG\_3

ID:CDP-CIRD-84190

The CDP **shall** receive the redirected PDU STATUS\_MSG\_3 message via CAN bus from the PDUs with the signals identified in below table in column "STATUS\_MSG\_3 FROM PDU X" and assigned to the signal names mentioned in column "CDP Signal Mapping":

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Analysis, Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **STATUS\_MSG\_3 FROM PDU X** | **CDP Signal Mapping** |
| PDU\_Roller\_Speed | PDU\_X\_PDU\_Roller\_Speed |
| PDU\_LM\_Speed | PDU\_X\_PDU\_LM\_Speed |
| PDU\_LM\_Hall\_Count | PDU\_X\_PDU\_LM\_Hall\_Count |

Table - Redirected PDU STATUS\_MSG\_3

#### Configuration Information Received from CPIOM

ID:CDP-CIRD-90768

Aftter power up, the CDP **shall** receive the configuration information messages from the CPIOM on CAN bus. Refer to the table mentioned below for the message name and its corresponding payload/Signal names.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **Message Name** | **Payload/ Signal Name** |
| LRU\_FIN | FIN\_CH\_1 |
|  | FIN\_CH\_2 |
|  | FIN\_CH\_3 |
|  | FIN\_CH\_4 |
|  | FIN\_CH\_5 |
|  | FIN\_CH\_6 |
|  | FIN\_CH\_7 |
|  | FIN\_CH\_8 |
| DATE\_TIME | Date\_Time |
| ARN\_MSN | ARN\_CH\_2 |
|  | ARN\_CH\_3 |
|  | ARN\_CH\_4 |
|  | ARN\_CH\_5 |
|  | ARN\_CH\_6 |
| AIRPORT\_CODE | AIRPORT\_CODE\_CH\_1 |
|  | AIRPORT\_CODE\_CH\_2 |
|  | AIRPORT\_CODE\_CH\_3 |

Table - Message Name and Signal Name

#### Data Loader Messages

ID:CDP-CIRD-105756

When in 'Data Loading Mode' or 'Live Data Mode', the CDP shall receive the 'UPLOAD\_REQUEST' message payload as per the signals defined in CAN ICD ("Rpt 11594").

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105757

When in Data Loading Mode, the CDP shall receive the 'UPLOAD\_MESSAGE' message payload as per the signals defined in CAN ICD ("Rpt 11594").

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-105758

When in Data Loading Mode, the CDP shall receive the 'WACK' message payload as per the signals defined in CAN ICD ("Rpt 11594").

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

### CAN Input Processing

ID:CDP-CIRD-41444

The CDP **shall** process the incoming message when the following are true:

* Valid node id [Translated node id]
* Valid CRC
* Valid function identifier
* CAN LRU\_X\_Data Stale fault is False
* CAN Input data fault is False

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the criteria to process a CAN message received  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

#### PDU STOP Input

ID:CDP-CIRD-42282

When any of the "PDU STOP "signals listed in the below table is set to ON, the CDP **shall** automatically navigate to the main page (if not in main page) and indicate the respective Control Panel Icon with a red hat in which "PDU STOP" signal has been set to ON.

Note: Refer to the CDP-CIRD-41502 for the Panel status symbol representation of the Control Panel Icon when PDU stop is on.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |  |
| --- | --- |
| **PDU STOP SIGNALS** | **CONTROL PANEL ICON TO BE DISPLAYED with Red Hat** |
| MCP\_PB\_PDU\_Stop | MCP |
| ICP\_PB\_PDU\_Stop | ICP |
| OCP\_PB\_PDU\_Stop | OCP |
| LCP1LH\_PB\_PDU\_Stop | LCP1 LH |
| LCP2LH\_PB\_PDU\_Stop | LCP2 LH |
| LCP3LH\_PB\_PDU\_Stop | LCP3 LH |
| LCP4LH\_PB\_PDU\_Stop | LCP4 LH |
| LCP1RH\_PB\_PDU\_Stop | LCP1 RH |
| LCP2RH\_PB\_PDU\_Stop | LCP2 RH |
| LCP3RH\_PB\_PDU\_Stop | LCP3 RH |
| LCP4RH\_PB\_PDU\_Stop | LCP4 RH |

Table - PDU STOP SIGNALs to Control Panel Page Mapping

ID:CDP-CIRD-42283

When the PDU Stop signal mentioned in CDP-CIRD-42282 (Table-25) is ON, the CDP **shall** highlight the PDU stop Status in Red color upon navigation to the Control Panel Status Page from Continuous Monitoring Page.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies the PDU Stop representation on CP Status Page when PDU Stop is ON  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

### Transmit Message Processing

#### CDP\_STATUS\_DATA

ID:CDP-CIRD-84212

The CDP **shall** transmit the following status signals as CDP\_STATUS\_DATA message every 250ms via CAN bus

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |
| --- |
| **Signal Name** |
| Measured\_Current |
| Measured\_Voltage |
| CDP\_Health\_Status |
| CAN\_Address\_Pin\_Parity\_Fault |
| Program\_Integrity\_Check\_Fault |
| Fault\_1 |
| Fault\_2 |
| Fault\_3 |
| Fault\_4 |
| Fault\_5 |
| Fault\_6 |

Table - CDP Tx CDP\_STATUS\_DATA

#### CONFIGURATION\_DATA

ID:CDP-CIRD-90779

The CDP **shall** transmit the following configuration report signals as CONFIGURATION\_DATA message every 60 seconds to CPIOM via CAN bus.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

|  |
| --- |
| **Signal** |
| Config\_Info\_Type |
| Frame\_Id |
| Num\_of\_Character |
| Frame\_CH\_1 |
| Frame\_CH\_2 |
| Frame\_CH\_3 |
| Frame\_CH\_4 |
| Frame\_CH\_5 |
| Frame\_CH\_6 |
| Frame\_CH\_7 |

Table - CDP Tx CONFIGURATION\_DATA

#### DATA LOADER MESSAGES

ID:CDP-CIRD-105755

When in Data Loading Mode, the CDP shall transmit the 'UPLOAD\_RESPONSE' message payload as per the signals defined in CAN ICD ("Rpt 11594").

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## CDP SOFTWARE OVERVIEW

ID:CDP-CIRD-83735

The CDP **shall** only provide information to the operator.

Information may be used also for maintenance or trouble shooting purpose.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-83736

The CDP **shall** not be used as an input device for cargo system operation.

**Applicability:** SW  
**Object Type:** Verbatim  
**Verification Method:** Design Review  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-26427

The CDP human machine interface (HMI) **shall** provide 4 hierarchical levels inside CDP application:

* Level-1 : Main page
* Level-2 : Maintenance Overview page
* Level-3 : Continuous Monitoring Overview / Detailed System Status
* Level-4 : Individual Sections / Status of individual PDUs & CPs

Refer to the below figure for the pictorial representation of the Page Levels.

Note: Level 1 represents the highest page Level and Level 4 being the lowest page level

**Applicability:** SW  
**Object Type:** Verbatim  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

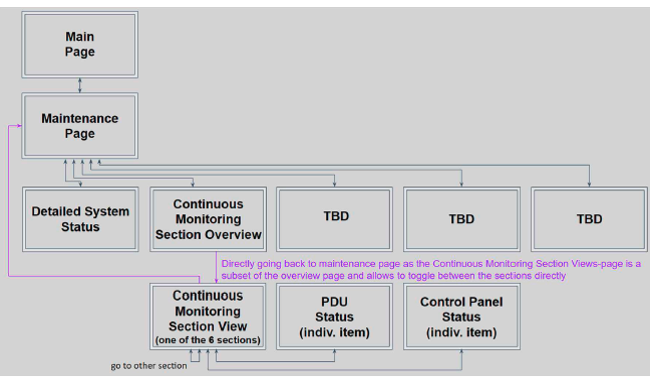


Figure 8 - CDP Page Levels

ID:CDP-CIRD-26430

The CDP **shall** have capability to transition from one page to another page in 1 Sec +/-10% when the operator selects any of the navigation buttons.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the time taken for the CDP to transition from one page to another.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-43399

The CDP **shall** display the Page name for Level 2 to Level 4 pages in the respective Page as a Heading.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the Page heading information  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-82777

The CDP **shall** provide means to navigate back from the lower level pages to the higher-level Pages and represented as pictorial icon as shown in the figure referenced below:

**Applicability:** SW  
**Object Type:** Verbatim  
**Verification Method:** Inspection  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

Embedded Image

Figure 9 - Back Navigation Icon

ID:CDP-CIRD-82782

The CDP pages **shall** be implemented to follow the below HMI rules:

* All Control Panels to be represented as pictorial icons
* Symbolic Aircraft outline and Cargo Door
* Display Legends on demand
* Control Panel status to be indicated using different colors on the respective Control panel icons as mentioned in CDP-CIRD-83645
* PDU to be represented as mentioned in CDP-CIRD-41504
* PDU status to be indicated using different color as mentioned in requirement CDP-CIRD-41508
* Visually associate Panel zones to panel icons as mentioned in requirement CDP-CIRD-29230, CDP-CIRD-85440
* Impact area / active access zone legend for LH and RH panels, also for OCP, MCP and ICP

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Design Review, Inspection  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## CDP SW MAIN PAGE

This section describes the requirements associated with the System status that are to be displayed on the Main Page of the Cargo Display Panel (CDP)

ID:CDP-CIRD-26467

The CDP **shall** implement the Main Page layout by replicating the visual indication of Main Deck Cargo Bay with the PDUs, Control Panel positions, and Access Zones, as shown in below picture.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Inspection, Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

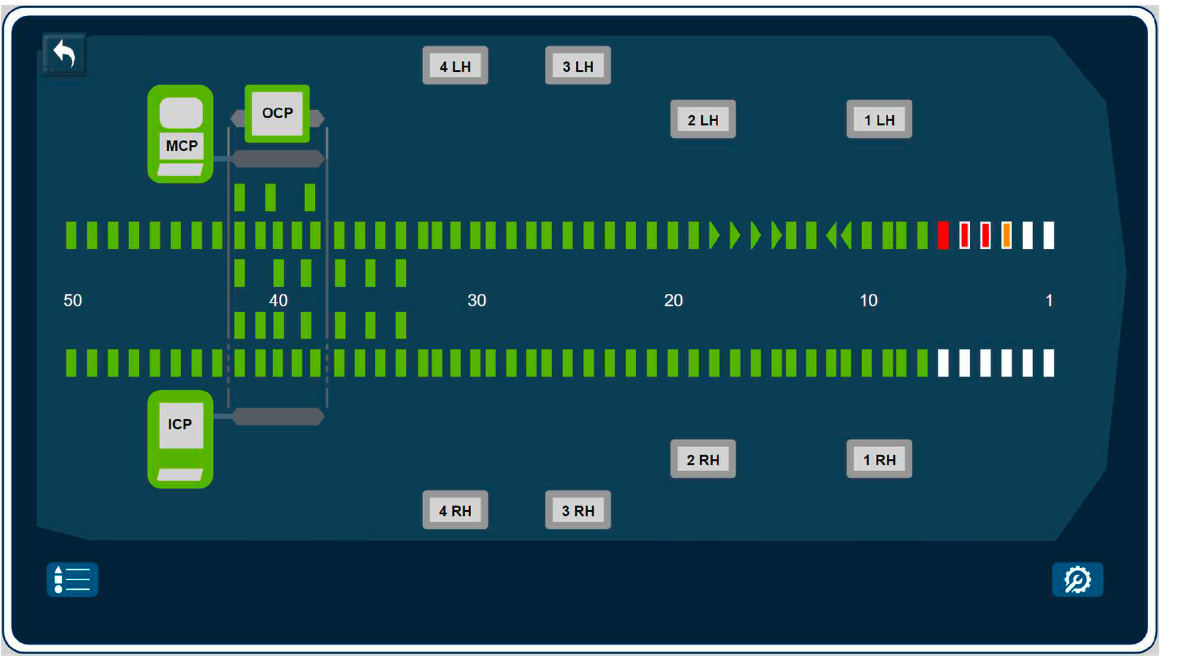


Figure 10 - CDP MAIN PAGE LAYOUT

ID:CDP-CIRD-26956

The CDP Main page **shall** have option to navigate to "**Maintenance Page**" by means of a selector button (Soft / programmable button) represented as a pictorial icon as shown below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

Embedded Image

Figure 11 - CDP Main Page - Navigation to Maintenance Page Icon

ID:CDP-CIRD-83238

The CDP s**hall** implement the visual representation of the legends menu icon as shown in the below figure:

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the legends menu representation in the Main page.  
**Verification Method:** Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

Embedded Image

Figure 12 - CDP Main Page - Legends Icon

ID:CDP-CIRD-83645

The CDP **shall** implement the visual representation of Control Panels in the Main page as shown in the below referenced figure:

Note: X in the LCPs in the below figure represents the LCP numbers 1- 4

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the Control Panel representation in the Main page.  
**Verification Method:** Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

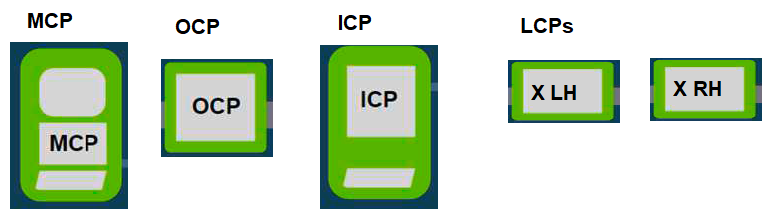


Figure 13 - CDP Main Page- Pictorial representation of Control Panels

ID:CDP-CIRD-28613

The CDP **shall** implement the visual indication of access zones in the main page as shown in the figures referenced below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

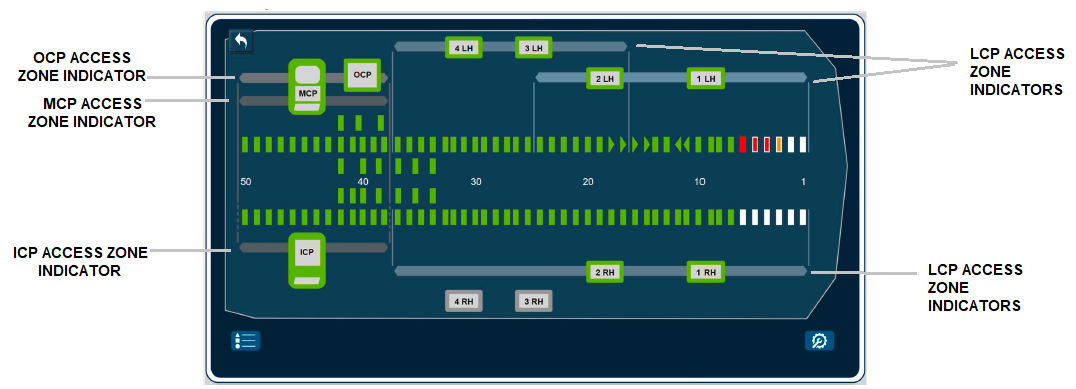


Figure 14 - Sample Main Page Layout with FWD zone enabled for MCP, ICP and OCPs and various LCPs access

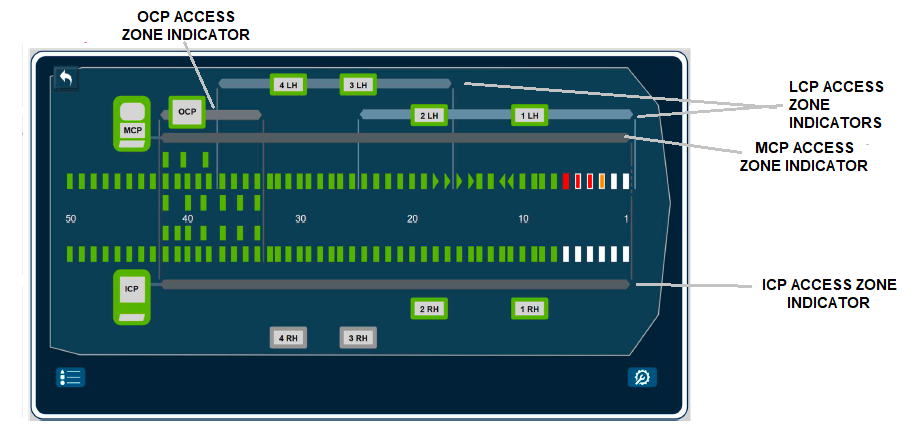


Figure 15 - Sample Main page layout with AFT Zone Enabled for MCP, ICP and OCP and Various LCPs Access

ID:CDP-CIRD-85440

The CDP **shall r**epresent the access zones into 3 different indicator parts as mentioned below:

1. Access Zone Indicator

2. Access Zone Border Lines to specify the limit of access for a particular Control Panel.

3. The Connector line from Control Panel to the Access Zone Indicator [This applies only when the Access Zone Indicator doesn't pass through the Control Panel Icons].

Refer to the sample picture below which includes all these definitions:

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies the details of access zone indicator.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

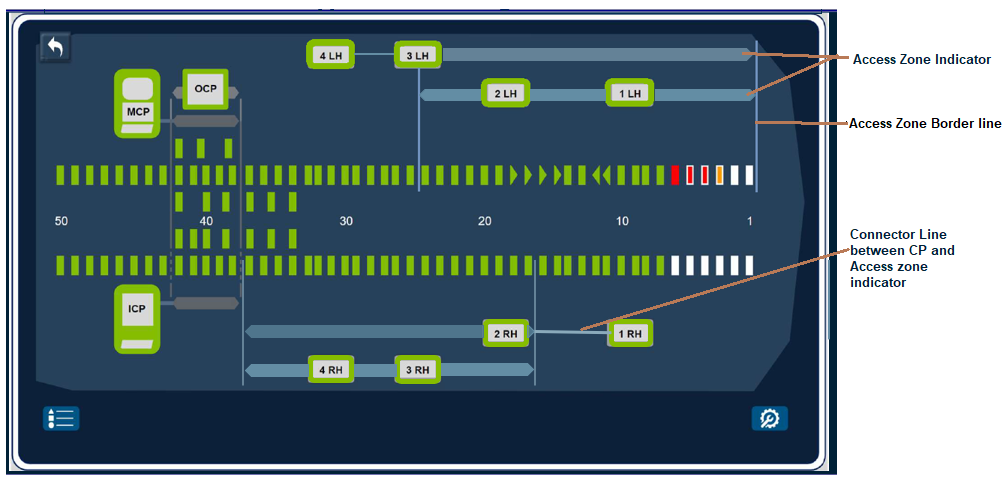


Figure 16 - Sample Figure with Zone 8 and Zone 10 Enabled and with all three access zone definitions

ID:CDP-CIRD-29219

The CDP **shall** show the access zone indicators for the MCP, ICP and OCP in shades of grey.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the representation of access zone indicator.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-29229

The CDP **shall** show the access zone indicators for the LCPs in the shades of light blue.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the representation of access zone indicator.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-29230

The CDP **shall** implement the visual representation of access zone indicators to pass through or connect with a line (as needed) to the respective Control Panel Icons in order to visually associate the Panel access to Panel icons.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the representation of access zone indicator.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-28614

The CDP **shall** implement access zone indicators to grow or shrink dynamically based on access zones that are enabled out of 29 possible access zone scenarios.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which explains on the design implementation of the access zone on the CDP display.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-85273

The CDP **shall** identify the enabled access zone when Access\_Zone\_X\_Enabled received on the CAN bus is set to True.

Note: X may be any of 1 to 29. Also more than one access zone can be enabled at a time. Hence multiple signals in the CARGO\_ZONE\_ENABLED message can be set to True.

Refer to CPIOM CIRD Rpt 11633 for the details related to the various access zones.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the access zone signal received on the CAN bus to the CDP display function which indicates the access zones enabled.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41502

The CDP **shall** provide the Panel Status symbols as shown in the figure referenced below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

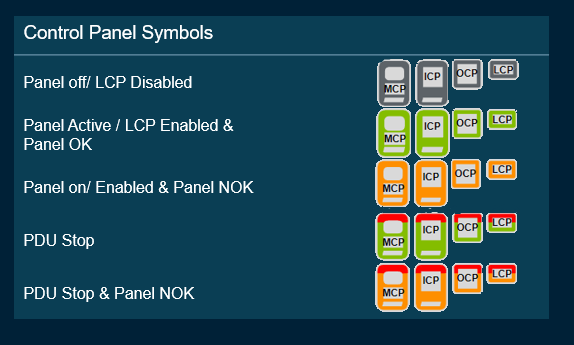


Figure 17 - Panel Status Symbol

ID:CDP-CIRD-41503

The CDP **shall** indicate the Control Panel status through the Control Panel Icons accordingly in correlation with the figure referenced below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Design Review, Inspection, Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

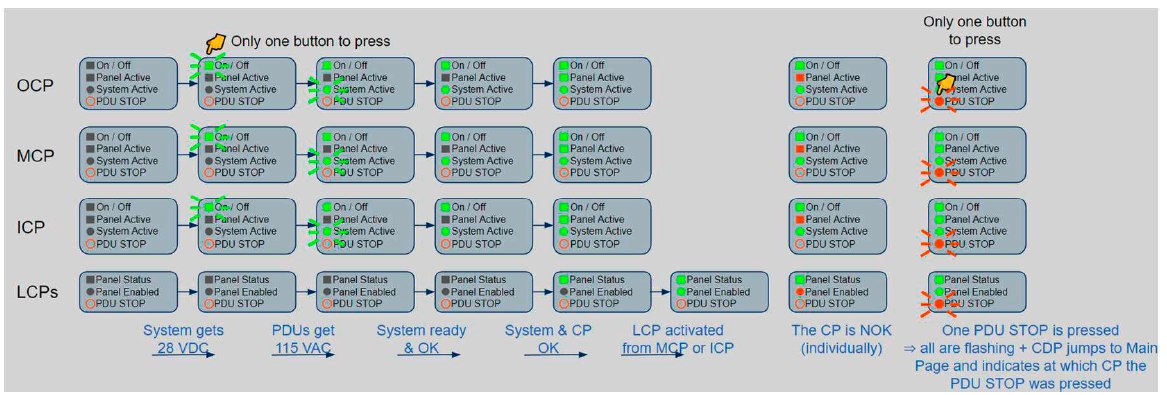


Figure 18 - Overall Panel Status indication

ID:CDP-CIRD-85407

The CDP **shall** implement the Panel Status indications based on the conditions identified in the table below for each of the control panels against each Panel state.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the representation of Panel Status indications on Main Page  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Panel Status** | **MCP** | **ICP** | **OCP** | **LCP** | **Color** |
| **Panel OFF / Disabled** | MCP\_PB\_On\_Off\_LED = False | ICP\_PB\_On\_Off\_LED = False | OCP\_PB\_On\_Off\_LED = False | LCP1LH\_LED\_Panel\_Enabled = False **And**  (LCP1LH\_Panel\_Status !=4 **OR**LCP1LH\_Panel\_Status !=5 )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP2LH\_LED\_Panel\_Enabled = False A**nd**  (LCP2LH\_Panel\_Status !=4 **OR**LCP2LH\_Panel\_Status !=5)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3LH\_LED\_Panel\_Enabled = False **And**  (LCP3LH\_Panel\_Status !=4 **OR**LCP3LH\_Panel\_Status !=5)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4LH\_LED\_Panel\_Enabled = False **And**  (LCP4LH\_Panel\_Status !=4 **OR**LCP4LH\_Panel\_Status !=5)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP1RH\_LED\_Panel\_Enabled = False **And**  (LCP1RH\_Panel\_Status !=4 **OR**LCP1RH\_Panel\_Status !=5)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP2RH\_LED\_Panel\_Enabled = False **And**  (LCP2RH\_Panel\_Status !=4 **OR**LCP2RH\_Panel\_Status !=5)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3RH\_LED\_Panel\_Enabled = False **And**  (LCP3RH\_Panel\_Status !=4 **OR**LCP3RH\_Panel\_Status !=5)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4RH\_LED\_Panel\_Enabled = False **And**  (LCP4RH\_Panel\_Status !=4 **OR** LCP4RH\_Panel\_Status !=5) | **Grey** |
| **Panel Active / LCP Enabled**  **& Panels OK** | (MCP\_PB\_On\_Off\_LED =  True **And**  MCP\_LED\_System\_Active = True ) **And**  (MCP\_Panel\_Status = 4 (OP State) **And**  MCP\_Switch\_Fault\_Status = False ) | (ICP\_PB\_On\_Off\_LED =  True **And**  ICP\_LED\_System\_Active = True ) **And**  (ICP\_Panel\_Status =  4 (OP State) **And**  ICP\_Switch\_Fault\_Status = False) | (OCP\_PB\_On\_Off\_LED =  True **And**  OCP\_LED\_System\_Active = True ) **And**  (OCP\_Panel\_Status =  4 (OP State) **And**  OCP\_Switch\_Fault\_Status= False) | LCP1LH\_LED\_Panel\_Enabled =  True **And**  (LCP1LH\_Switch\_Fault\_Status = False  **And** LCP1LH\_Panel\_Status = 4 (OP State))  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP2LH\_LED\_Panel\_Enabled =  True **And**  (LCP2LH\_Switch\_Fault\_Status = False **And** LCP2LH\_Panel\_Status = 4 (OP State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3LH\_LED\_Panel\_Enabled =  True **And**  (LCP3LH\_Switch\_Fault\_Status = False **And** LCP3LH\_Panel\_Status = 4 (OP State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4LH\_LED\_Panel\_Enabled =  True **And**  (LCP4LH\_Switch\_Fault\_Status = False **And** LCP4LH\_Panel\_Status = 4 (OP State))  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP1RH\_LED\_Panel\_Enabled =  True **And**  (LCP1RH\_Switch\_Fault\_Status = False **And** LCP1RH\_Panel\_Status = 4 (OP State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   LCP2RH\_LED\_Panel\_Enabled =  True **And**  (LCP2RH\_Switch\_Fault\_Status = False **And** LCP2RH\_Panel\_Status = 4 (OP State))  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3RH\_LED\_Panel\_Enabled =  True **And**  (LCP3RH\_Switch\_Fault\_Status = False **And** LCP3RH\_Panel\_Status = 4 (OP State))  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4RH\_LED\_Panel\_Enabled =  True **And**  (LCP4RH\_Switch\_Fault\_Status = False **And** LCP4RH\_Panel\_Status = 4 (OP State)) | **Green Hat +Green ICON** |
| **System Active / LCP Enabled**  **& Panels NOK** | (MCP\_PB\_On\_Off\_LED =  True **And**  MCP\_LED\_System\_Active = True) **And**  (MCP\_Panel\_Status = 5 (FAIL State) **Or**  MCP\_Switch\_Fault\_Status = True ) | (ICP\_PB\_On\_Off\_LED =  True **And**  ICP\_LED\_System\_Active = True ) **And**  (ICP\_Panel\_Status =   5 (FAIL State) **Or**  ICP\_Switch\_Fault\_Status = True) | (OCP\_PB\_On\_Off\_LED =  True **And**  OCP\_LED\_System\_Active = True ) **And**  (OCP\_Panel\_Status =   5 (FAIL State) **Or**  OCP\_Switch\_Fault\_Status= True ) | LCP1LH\_LED\_Panel\_Enabled =  True **And**  (LCP1LH\_Switch\_Fault\_Status = True **Or** LCP1LH\_Panel\_Status =  5 (FAIL State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP2LH\_LED\_Panel\_Enabled =  True **And**  (LCP2LH\_Switch\_Fault\_Status =  True **Or** LCP2LH\_Panel\_Status = 5 (FAIL State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3LH\_LED\_Panel\_Enabled =  True **And**  (LCP3LH\_Switch\_Fault\_Status =  True **Or** LCP3LH\_Panel\_Status = 5 (FAIL State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4LH\_LED\_Panel\_Enabled =  True **And**  (LCP4LH\_Switch\_Fault\_Status =  True **Or** LCP4LH\_Panel\_Status = 5 (FAIL State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP1RH\_LED\_Panel\_Enabled =  True **And**  (LCP1RH\_Switch\_Fault\_Status =  True **Or** LCP1RH\_Panel\_Status = 5 (FAIL State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   LCP2RH\_LED\_Panel\_Enabled =  True **And**  (LCP2RH\_Switch\_Fault\_Status =  True **Or** LCP2RH\_Panel\_Status = 5 (FAIL State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3RH\_LED\_Panel\_Enabled =  True **And**  (LCP3RH\_Switch\_Fault\_Status =  True **Or** LCP3RH\_Panel\_Status =5 (FAIL State) )  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4RH\_LED\_Panel\_Enabled =  True **And**  (LCP4RH\_Switch\_Fault\_Status = False **Or** LCP4RH\_Panel\_Status = 5 (FAIL State) ) | **Amber Hat +Amber ICON** |
| **PDU Stop** | (MCP\_PB\_On\_Off\_LED =  True **And**  MCP\_LED\_System\_Active = True ) **And**  (MCP\_Panel\_Status = 4 (OP State) **And**  MCP\_Switch\_Fault\_Status = False ) **And**  MCP\_PB\_PDU\_Stop = True | (ICP\_PB\_On\_Off\_LED =  True **And**  ICP\_LED\_System\_Active = True) **And**  (ICP\_Panel\_Status =  4 (OP State) **And**  ICP\_Switch\_Fault\_Status = False ) **And**  ICP\_PB\_PDU\_Stop = True | (OCP\_PB\_On\_Off\_LED =  True **And**  OCP\_LED\_System\_Active = True) **And**  (OCP\_Panel\_Status =  4 (OP State) **And**  OCP\_Switch\_Fault\_Status= False) **And**  OCP\_PB\_PDU\_Stop = True | LCP1LH\_LED\_Panel\_Enabled =  True **And**  (LCP1LH\_Switch\_Fault\_Status = False  **And** LCP1LH\_Panel\_Status = 4 (OP State))  **And**LCP1LH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP2LH\_LED\_Panel\_Enabled =  True **And**  (LCP2LH\_Switch\_Fault\_Status = False **And** LCP2LH\_Panel\_Status = 4 (OP State))  **And**LCP2LH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (LCP3LH\_LED\_Panel\_Enabled =  True **And**  LCP3LH\_Switch\_Fault\_Status = False **And** LCP3LH\_Panel\_Status = 4 (OP State))  **And** LCP3LH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (LCP4LH\_LED\_Panel\_Enabled =  True **And**  LCP4LH\_Switch\_Fault\_Status = False) **And** (LCP4LH\_Panel\_Status = 4 (OP State) )  **And** LCP4LH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP1RH\_LED\_Panel\_Enabled =  True **And**  LCP1RH\_Switch\_Fault\_Status = False **And** LCP1RH\_Panel\_Status = 4 (OP State)  **And** LCP1RH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   LCP2RH\_LED\_Panel\_Enabled =  True **And**  (LCP2RH\_Switch\_Fault\_Status = False **And** LCP2RH\_Panel\_Status = 4 (OP State))  **And** LCP2RH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3RH\_LED\_Panel\_Enabled =  True **And**  (LCP3RH\_Switch\_Fault\_Status = False **And** LCP3RH\_Panel\_Status = 4 (OP State))  **And** LCP3RH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4RH\_LED\_Panel\_Enabled =  True **And**  (LCP4RH\_Switch\_Fault\_Status = False **And** LCP4RH\_Panel\_Status = 4 (OP State) )**And** LCP4RH\_PB\_PDU\_Stop = True | **Red Hat + Green ICON** |
| **PDU Stop & Panel NOK** | (MCP\_PB\_On\_Off\_LED =  True **And**  MCP\_LED\_System\_Active = True) **And**  (MCP\_Panel\_Status = 5 (FAIL State) **Or**  MCP\_Switch\_Fault\_Status = True) **And**  MCP\_PB\_PDU\_Stop = True | (ICP\_PB\_On\_Off\_LED =  True **And**  ICP\_LED\_System\_Active = True) **And**  (ICP\_Panel\_Status =   5 (FAIL State) **or**  ICP\_Switch\_Fault\_Status = True ) **And**  ICP\_PB\_PDU\_Stop = True | (OCP\_PB\_On\_Off\_LED =  True **And**  OCP\_LED\_System\_Active = True ) **And**  (OCP\_Panel\_Status =   5 (FAIL State) **or**  OCP\_Switch\_Fault\_Status= True) **And**  OCP\_PB\_PDU\_Stop = True | LCP1LH\_LED\_Panel\_Enabled =  True **And**  (LCP1LH\_Switch\_Fault\_Status = True **or** LCP1LH\_Panel\_Status =  5 (FAIL State) ) **And** LCP1LH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP2LH\_LED\_Panel\_Enabled =  True **And**  (LCP2LH\_Switch\_Fault\_Status =  True **Or** LCP2LH\_Panel\_Status = 5 (FAIL State) ) **And** LCP2LH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3LH\_LED\_Panel\_Enabled =  True **And**  (LCP3LH\_Switch\_Fault\_Status =  True **Or** LCP3LH\_Panel\_Status = 5 (FAIL State) )  **And**LCP3LH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4LH\_LED\_Panel\_Enabled =  True **And**  (LCP4LH\_Switch\_Fault\_Status =  True **Or** LCP4LH\_Panel\_Status = 5 (FAIL State) )  **And** LCP4LH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP1RH\_LED\_Panel\_Enabled =  True **And**  (LCP1RH\_Switch\_Fault\_Status =  True **Or** LCP1RH\_Panel\_Status = 5 (FAIL State) )  **And** LCP1RH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   LCP2RH\_LED\_Panel\_Enabled =  True**And**  (LCP2RH\_Switch\_Fault\_Status =  True**Or** LCP2RH\_Panel\_Status = 5 (FAIL State) )  **And** LCP2RH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP3RH\_LED\_Panel\_Enabled =  True **And**  (LCP3RH\_Switch\_Fault\_Status =  True **Or** LCP3RH\_Panel\_Status =5 (FAIL State) )  **And** LCP3RH\_PB\_PDU\_Stop = True  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  LCP4RH\_LED\_Panel\_Enabled =  True **And**  (LCP4RH\_Switch\_Fault\_Status = False**Or** LCP4RH\_Panel\_Status = 5 (FAIL State) )  **And** LCP4RH\_PB\_PDU\_Stop = True | **Red Hat + Amber ICON** |

Table - Panels Status Indication Mapping

ID:CDP-CIRD-41504

The CDP **shall** represent PDUs as shown in the figure referenced below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

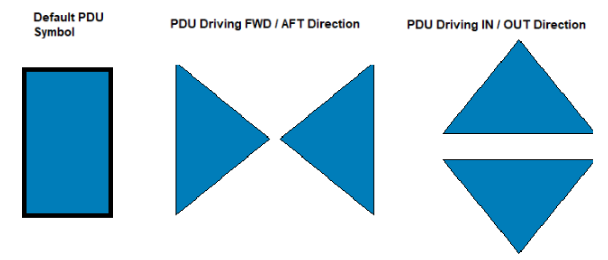


Figure 19 - PDU Representation Symbols

ID:CDP-CIRD-85410

The CDP **shall** update the PDU symbol and point to the respective direction while the PDU is driving as described in CDP-CIRD-41504

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the representation of PDU symbol indications on Main Page  
**Verification Method:** Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-85446

The CDP **shall** implement the PDU State indications based on the "General Status".

Note: Refer to the requirement CDP-CIRD-42052 for the "General Status".

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the representation of PDU state indications on Main Page  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41508

The CDP **shall** implement the visual indication of each PDU state with different shape and color as mentioned in the below table:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

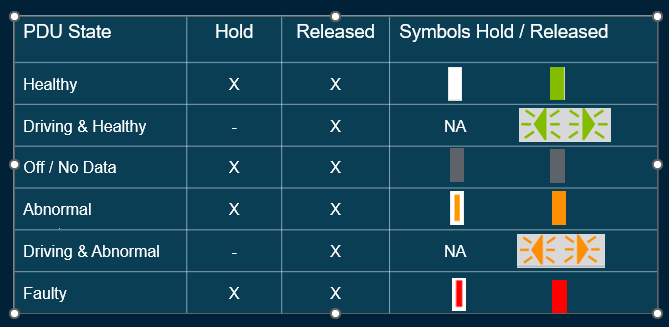


Figure 20 - CDP PDU Status Symbol

ID:CDP-CIRD-41510

The CDP **shall** display the Panel Status symbols and PDU status symbols in a pop up screen when the legends menu icon is selected as shown in the below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

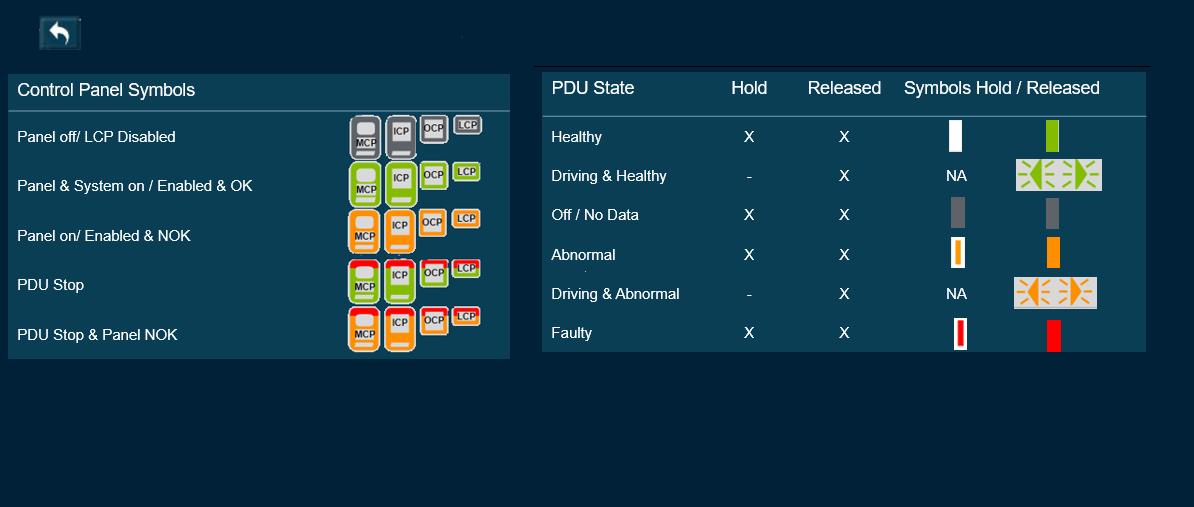


Figure 21 - COLOR-CODING INFORMATION FOR CONTROL PANEL AND PDU INDICATORS

ID:CDP-CIRD-83458

The CDP **shall** have option to navigate back to Main Page from the Legends Menu page.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which specifies about the navigation to the Main Page  
**Verification Method:** Inspection, Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

## CDP SW MAINTANENCE PAGE

This section describes the requirements associated with the System status and the subpages that are to be displayed on the Maintenance Pages of the Cargo Display Panel (CDP).

ID:CDP-CIRD-42284

The CDP **shall** implement the Maintenance page with the buttons to navigate to the following subpages as shown in the below referenced figure:

* System Status
* Continuous Monitoring

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

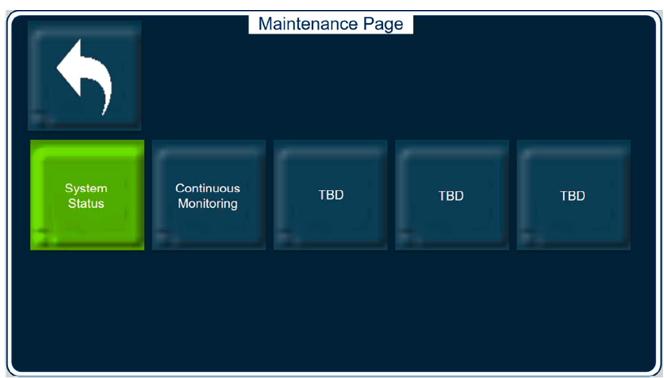


Figure 22 - CDP SW Maintenance Page

ID:CDP-CIRD-28618

The CDP SW application Maintenance page **shall** have an option to navigate back to CDP SW application Main page by means of a Selector button (soft / programmable button) as shown in the Figure in CDP-CIRD-82777.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-28619

The CDP SW application Maintenance page **shall** have an option to navigate to "Continuous Monitoring" page by means of Selector button (soft/ programmable button) as shown in the Figure in CDP-CIRD-42284.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-42136

The CDP SW application Maintenance page **shall** have an option to navigate to "DETAILED SYSTEM STATUS" page by means of Selector button (soft/ programmable button) as shown in the Figure in CDP-CIRD-42284.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

### DETAILED SYSTEM STATUS

This section describes the requirements associated with the System status information that are to be displayed in the Detailed System status Page.

ID:CDP-CIRD-42167

The CDP **shall** replicate the Main Page with respective PDUs and Control Panel positions with the exception of access zone indication in top half of the Detailed status page and Control Panel indicator status in the bottom half of the page, as shown in below picture.

Additional Information: Refer to Section 4.4 for the requirements related to the visual representation of CP, PDU symbols to be displayed in the top half of the page and the legends menu.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

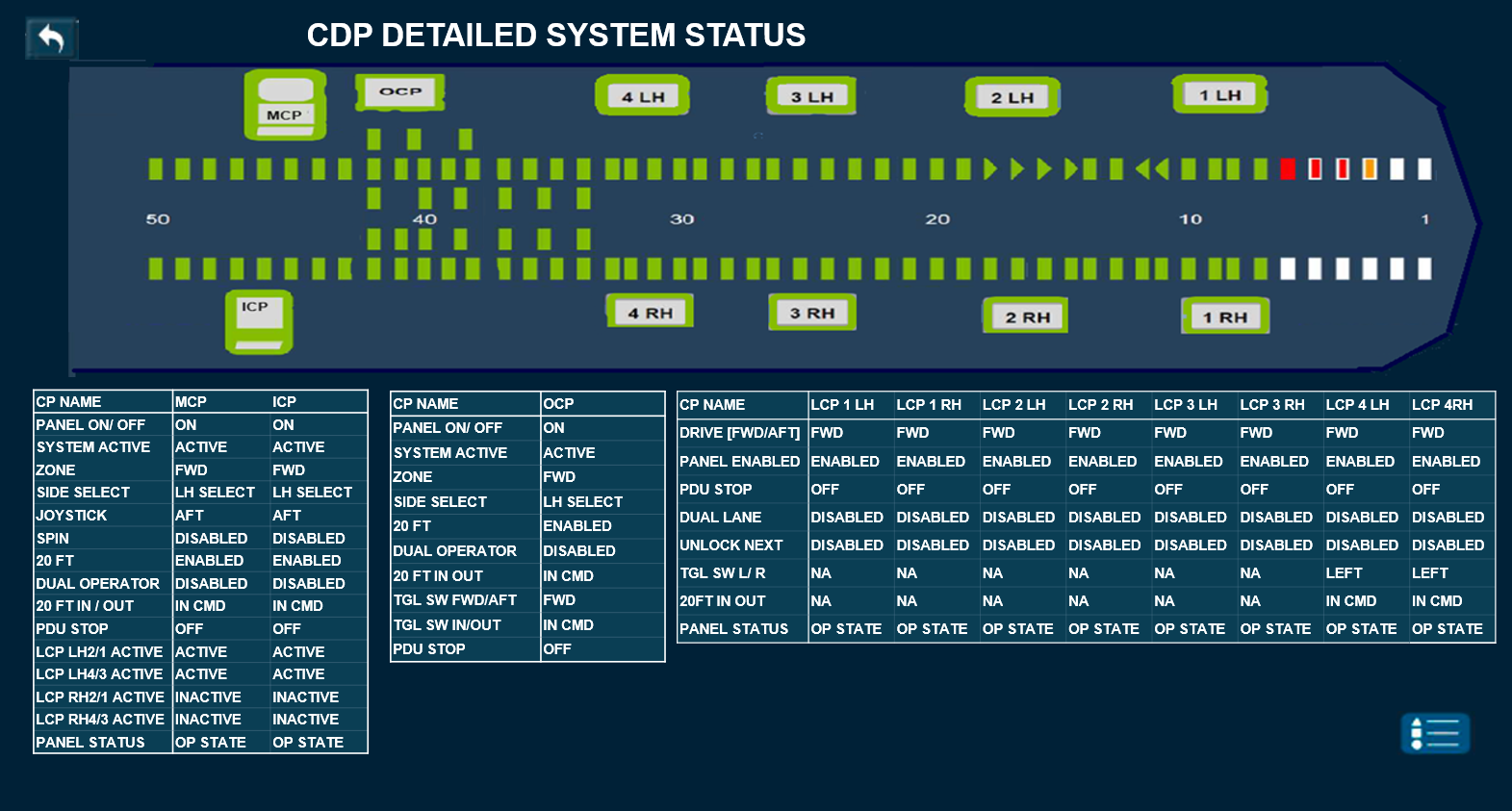


Figure 23 - CDP MAINTENANCE PAGE - DETAILED SYSTEM STATUS

ID:CDP-CIRD-28608

The CDP **shall** display the Control Panel indicators and its associated indications in Table Format as illustrated in below picture with 3 different tables as described below:   
•    One table for all the LCPs (LCP 1 RH, LCP 1 LH, LCP 2 RH, LCP 2 LH , LCP 3 RH, LCP 4 RH, LCP 4 LH)   
•    One table for OCP  
•     One table for MCP and ICP.  
 Refer to the sample picture of the Detailed System Status Page with the tables present in the Req. ID 42167

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

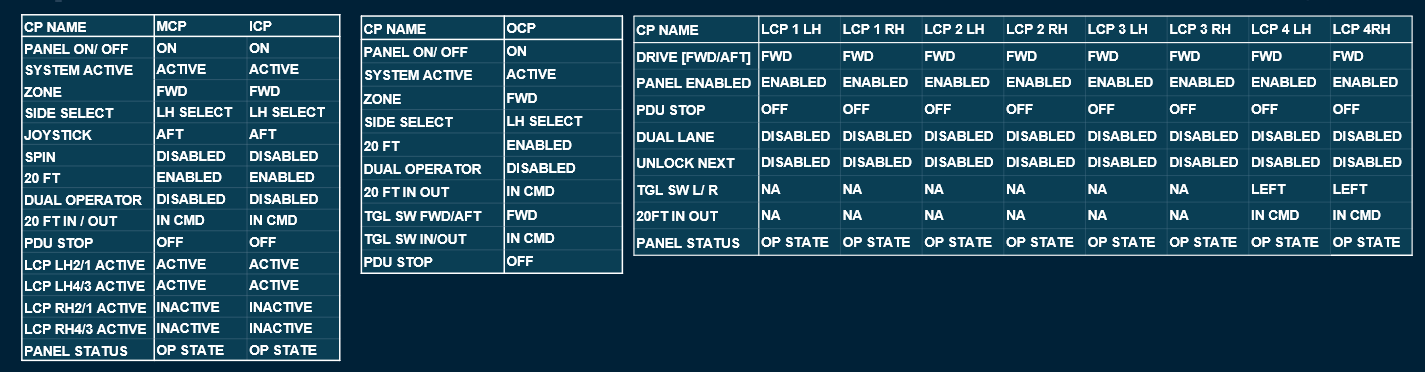


Figure 24 - CP TABLE REPRESENTATION

ID:CDP-CIRD-42140

The CDP **shall** have an option to navigate back to "Maintenance Page" from DETAILED SYSTEM STATUS Page by means of a Selector button (soft / programmable button) as shown in the Figure in CDP-CIRD-82777

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-42145

The CDP s**hall** implement the visual representation of the legends menu icon as shown in CDP-CIRD-83238

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-26963

For  Local Control Panels LCP 1 LH, LCP 1 RH, LCP 2 LH, LCP 2 RH, LCP 3 LH and LCP 3 RH, the CDP **shall** display the indicator names as shown below.

* DRIVE [FWD/AFT]
* PANEL ENABLED
* PDU Stop
* DUAL LANE
* UNLOCK NEXT
* Panel Status

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-42210

For Local Control Panels LCP 4 LH and LCP 4 RH, the CDP **shall** display the indicator names as shown below.

* DRIVE [FWD/AFT]
* PANEL ENABLED
* PDU Stop
* DUAL LANE
* UNLOCK NEXT
* TGL SW L/ R
* 20FT IN OUT
* Panel Status

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-26964

For Master Control Panel and Inside Control Panel, the CDP **shall** display the Indicator names as shown below.

* Panel On/ Off
* System Active
* Zone
* Side select
* Joystick
* Spin
* 20 ft
* Dual Operator
* 20 ft In / out
* PDU Stop
* LCP LH2/1 Active
* LCP LH4/3 Active
* LCP RH2/1 Active
* LCP RH4/3 Active
* Panel Status

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-26965

For Outside Control Panel, the CDP **shall** display the indicator names as mentioned below:

* Panel On/ Off
* System Active
* Zone
* Side select
* 20 ft
* Dual Operator
* TGL SW 20 ft In / out
* TGL SW L/R [FWD/AFT]
* TGL SW IN/OUT
* PDU Stop

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

### CDP SW Continuous Monitoring page

This section describes the requirements associated with the System status that are to be displayed on the Continuous Monitoring page of the Cargo Display Panel (CDP).

ID:CDP-CIRD-28621

The CDP **shall** have options to navigate back to "Main" Page from the Continuous Monitoring page by means of a Selector button (soft / programmable button) as shown in the Figure in CDP-CIRD-82777.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-28622

The CDP **shall** show PDUs and CPs Main Deck layout in background in one half of the page as depicted in the Main Page and have navigation buttons in foreground for each group of PDUs and CPs as sections in the Continuous Monitoring page as shown in the figure referenced below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

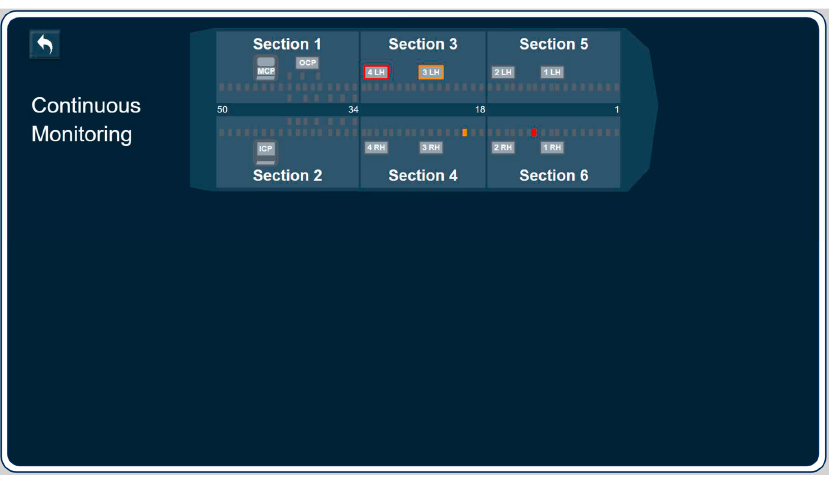


Figure 25 - Continuous Monitoring Page Access sections classification

ID:CDP-CIRD-28624

The CDP **shall** display the LRUs as buttons from the selected Section as well as reflect the current status as depicted in the Main Page in the bottom half of the page as shown in the figures referenced below:  
Note: See below pictures for reference.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

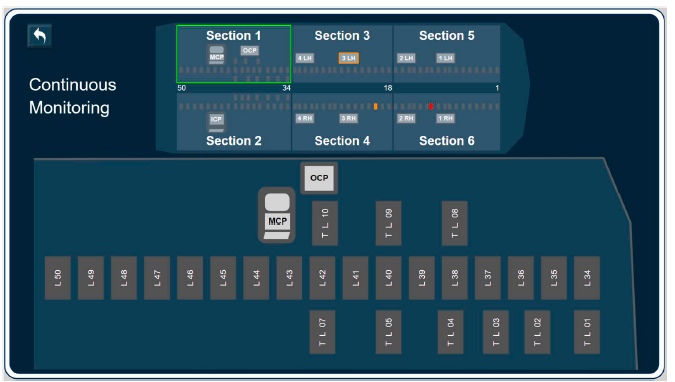


Figure 26 - CDP Continuous monitoring Page - Section -1 page

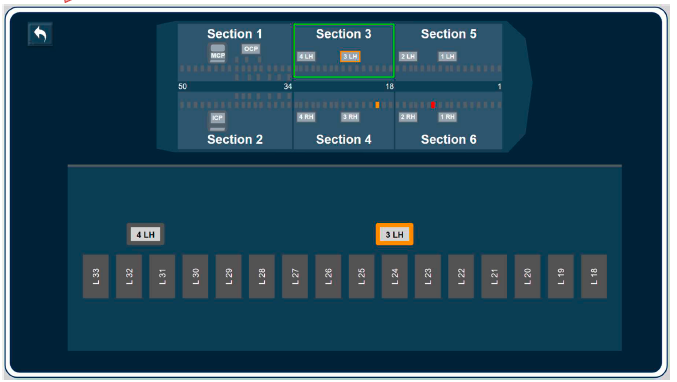


Figure 27 - CDP Continuous Monitoring Page - Section -3 Page

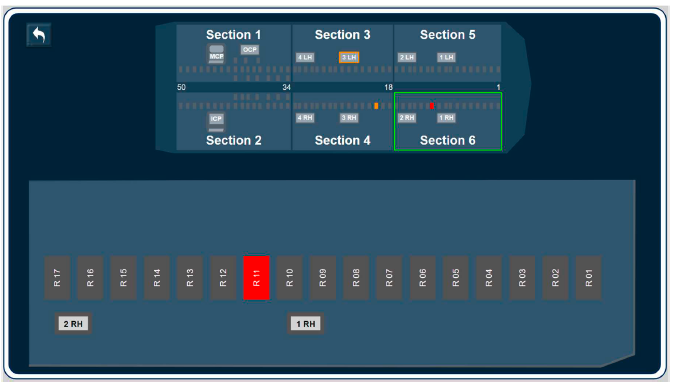


Figure 28 - CDP Continuous Monitoring Page - Section 6 Page

ID:CDP-CIRD-28630

The CDP **shall** navigate in to respective individual LRU status page when any of the PDUs are selected in the Continuous Monitoring Section View Page as shown in the figures referenced below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA



Figure 29 - CDP Continuous Monitoring - PDU Status Page

ID:CDP-CIRD-28632

The CDP **shall** have options to navigate back to Main Page from the CDP SW Continuous Monitoring PDU Status page by means of a Selector button (soft / programmable button) as shown in the Figure in CDP-CIRD-82777

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-28634

The CDP **shall** reflect the status of the PDU signals listed below as received on the CAN bus in the CDP SW Continuous Monitoring PDU Status page.

* PDU Number
* PDU Type
* PDU General Status
* Hold/ Release Status [Hold Status]
* Lift Status [PDU Roller Position]
* PDU Health Status
* PDU Cover Status
* PDU Mode
* PDU State
* Drive Motor Mode
* Lift Motor Mode
* Drive Motor State
* Lift Motor Control Seq State
* Lift Motor State
* Active Drive Command Direction
* DM Current Fault Monitoring Status
* LM Current Fault Monitoring Status
* HVDC Over Voltage Fault
* HVDC Under Voltage Fault
* IGBT Protection Trip
* Board Over Temperature Fault
* 115VAC Phase Fault
* Drive Motor Hall Sensor State Error
* Lift Motor Hall Sensor State Error
* Drive Motor State Machine Error
* Lift Motor State Machine Error
* Lift Mechanism Fault
* CAN Address Pin Parity Fault
* Program Integrity Check Fault
* RAM Fault
* NVM Fault
* HVDC Over Current Fault
* ATRU Right Coil Over Temperature Fault
* ATRU Left Coil Over Temperature Fault
* Drive Motor Over Temperature Fault
* IGBT Onchip Over Temperature Fault
* Current Mux
* Voltage Mux
* Temperature Mux
* Measured Current
* Measured Voltage
* Measured Temperature
* PDU Roller Speed
* PDU LM Speed
* PDU LM Hall Count

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-28635

The CDP **shall** be able to update the status of the PDU signals mentioned in CDP-CIRD-28634 every 250 ms +/-10% in the PDU Status page.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-28636

The CDP **shall** navigate in to respective individual LRU status page when any of the CPs are selected in the Continuous Monitoring Section View Page as shown in the figures referenced below:

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA



Figure 30 - CDP Continuous Monitoring Page - CP Status Page - MCP



Figure 31 - CDP Continuous Monitoring Page - CP Status Page - ICP



Figure 32 - CDP Continuous Monitoring Page - CP Status Page - OCP

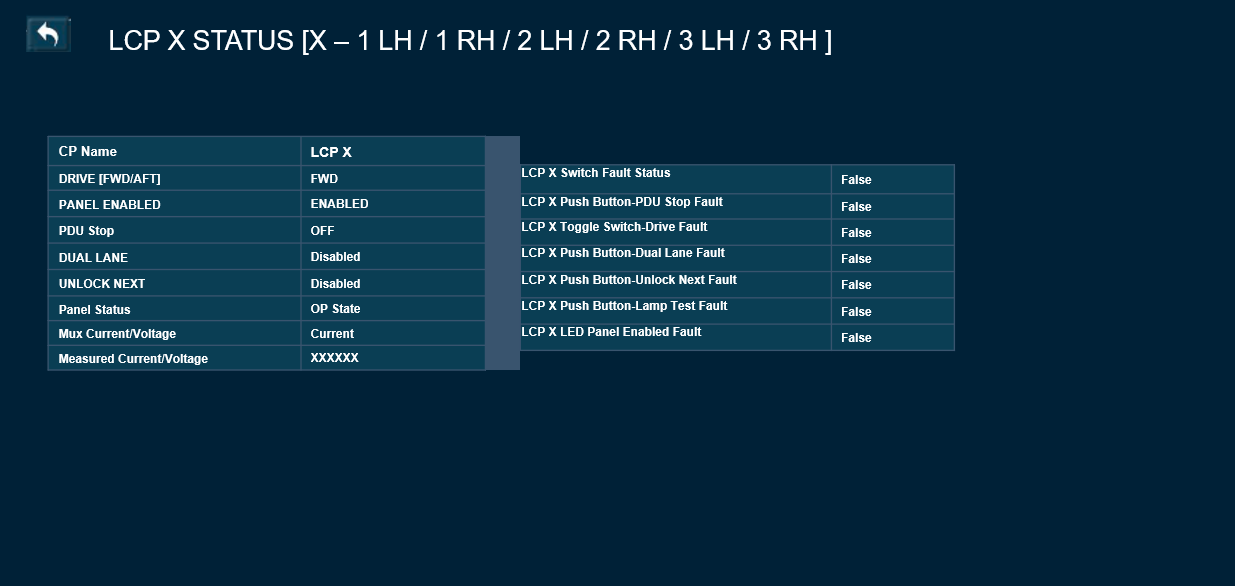


Figure 33 - CDP Continuous Monitoring Page - CP Status Page - LCP 1, LCP 2, LCP 3



Figure 34 - CDP Continuous Monitoring Page - CP Status Page - LCP 4

ID:CDP-CIRD-28638

The CDP **shall** have options to navigate back to Main Page from the CP Status Page by means of a Selector button (soft / programmable button) as shown in the Figure in CDP-CIRD-82777.

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-28640

When the operator selects the MCP button on the selected Section, the CDP **shall** reflect the status of the CP signals listed below as received on the CAN bus in CDP Continuous Monitoring CP Status page.

* CP Name
* Panel On/ Off
* System Active
* Zone
* Side select
* Joystick
* Spin
* 20 ft
* Dual Operator
* 20 ft In / out
* PDU Stop
* LCP LH2/1 Active
* LCP LH4/3 Active
* LCP RH2/1 Active
* LCP RH4/3 Active
* Panel Status
* Mux Current/Voltage
* Measured Current/Voltage
* MCP Switch Fault Status
* MCP Push Button-Power On Off Fault
* MCP Push Button-PDU Stop Fault
* MCP Push Button-Side Select Left Fault
* MCP Push Button-Side Select Right Fault
* MCP Push Button-Zone Select AFT Fault
* MCP Push Button-Zone Select FWD Fault
* MCP Push Button-LCP LH2 1 Enable Fault
* MCP Push Button-LCP LH4 3 Enable Fault
* MCP Push Button-LCP RH2 1 Enable Fault
* MCP Push Button-LCP RH4 3 Enable Fault
* MCP Push Button-Dual Operator Fault
* MCP Push Button-20FT Fault
* MCP Push Button-Spin Fault
* MCP Push Button-Lamp Test Fault
* MCP Joystick Fault
* MCP Toggle Switch-20FT Fault
* MCP LED System Active Fault

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-84416

When the operator selects the ICP button on the selected Section, the CDP **shall** reflect the status of the CP signals listed below as received on the CAN bus in CDP Continuous Monitoring CP Status page.

* CP Name
* Panel On/ Off
* System Active
* Zone
* Side select
* Joystick
* Spin
* 20 ft
* Dual Operator
* 20 ft In / out
* PDU Stop
* LCP LH2/1 Active
* LCP LH4/3 Active
* LCP RH2/1 Active
* LCP RH4/3 Active
* Panel Status
* Mux Current/Voltage
* Measured Current/Voltage
* ICP Switch Fault Status
* ICP Push Button-Power On Off Fault
* ICP Push Button-PDU Stop Fault
* ICP Push Button-Side Select Left Fault
* ICP Push Button-Side Select Right Fault
* ICP Push Button-Zone Select AFT Fault
* ICP Push Button-Zone Select FWD Fault
* ICP Push Button-LCP LH2 1 Enable Fault
* ICP Push Button-LCP LH4 3 Enable Fault
* ICP Push Button-LCP RH2 1 Enable Fault
* ICP Push Button-LCP RH4 3 Enable Fault
* ICP Push Button-Dual Operator Fault
* ICP Push Button-20FT Fault
* ICP Push Button-Spin Fault
* ICP Push Button-Lamp Test Fault
* ICP Joystick Fault
* ICP Toggle Switch-20FT Fault
* ICP LED System Active Fault

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-43396

When the operator selects the OCP button on the Section -1, the CDP **shall** reflect the status of the CP signals listed below as received on the CAN bus in CDP Continuous Monitoring CP Status page.

* CP Name
* Panel On/ Off
* System Active
* Zone
* Side select
* 20 ft
* Dual Operator
* TGL SW 20 ft In / out
* TGL SW L/R [FWD/AFT]
* TGL SW IN/OUT
* PDU Stop
* Panel Status
* Mux Current/Voltage
* Measured Current/Voltage
* OCP Switch Fault Status
* OCP Push Button-Power On Off Fault
* OCP Push Button-PDU Stop Fault
* OCP Push Button-Side Select Left Fault
* OCP Push Button-Side Select Right Fault
* OCP Push Button-Zone Select AFT Fault
* OCP Push Button-Zone Select FWD Fault
* OCP Toggle Switch-20FT Fault
* OCP Push Button-Dual Operator Fault
* OCP Push Button-20FT Fault
* OCP Toggle Switch-IN/OUT Fault
* OCP Toggle Switch-L/R Fault
* OCP Push Button-Lamp Test Fault
* OCP LED System Active Fault

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-43397

When the operator selects any of the LCP 1 LH / LCP 2 LH / LCP 3 LH / LCP 1 RH / LCP 2 RH / LCP 3 RH buttons on the selected Section, the CDP **shall** reflect the status of the CP signals listed below as received on the CAN bus in CDP Continuous Monitoring CP Status page.

* CP Name
* DRIVE [FWD/AFT]
* PANEL ENABLED
* PDU Stop
* DUAL LANE
* UNLOCK NEXT
* Panel Status
* Mux Current/Voltage
* Measured Current/Voltage
* LCP X Switch Fault Status
* LCP X Push Button-PDU Stop Fault
* LCP X Toggle Switch-Drive Fault
* LCP X Push Button-Dual Lane Fault
* LCP X Push Button-Unlock Next Fault
* LCP X Push Button-Lamp Test Fault
* LCP X LED Panel Enabled Fault

Note: X may be one of 1 LH / 2 LH / 3 LH / 1 RH / 2 RH / 3 RH

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-43398

When the operator selects the LCP 4LH or LCP 4RH button on the selected Section, the CDP **shall** reflect the status of the CP signals listed below as received on the CAN bus in CDP Continuous Monitoring CP Status page

* CP Name
* DRIVE [FWD/AFT]
* PANEL ENABLED
* PDU Stop
* DUAL LANE
* UNLOCK NEXT
* TGL SW L/ R
* 20FT IN OUT
* Panel Status
* Mux Current/Voltage
* Measured Current/Voltage
* LCP4X Switch Fault Status
* LCP4X Push Button-PDU Stop Fault
* LCP4X Toggle Switch-Drive Fault
* LCP4X Toggle Switch-L/R Fault
* LCP4X Toggle Switch-20FT Fault
* LCP4X Push Button-Dual Lane Fault
* LCP4X Push Button-Unlock Next Fault
* LCP4X Push Button-Lamp Test Fault
* LCP4X LED Panel Enabled Fault

Note: X may be one of 4LH or 4RH

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

ID:CDP-CIRD-28641

The CDP **shall** be able to update the status of all the CP signals listed in the below requirements every 250 ms +/-10% in Continuous Monitoring CP Status page.

* CDP-CIRD-28640
* CDP-CIRD-84416
* CDP-CIRD-43396
* CDP-CIRD-43397
* CDP-CIRD-43398

**Applicability:** SW  
**Object Type:** Decomposed  
**Verification Method:** Test  
**Safety Tag:** false  
**Safety Impact:** false  
**Safety Rationale:** NA

## CAN SIGNAL MAPPING TO DISPLAY INDICATIONS

This section describes about the mapping of signals received on the CAN Bus interface to the indicators that would be displayed on the Cargo Display Panel Pages.

ID:CDP-CIRD-84417

The CDP **shall** set CP Name / PDU Number to the respective LRU FIN number based on the translated Node identifier defined in CAN ICD Rpt 11594.

Additional Info: The LRU FIN numbers needs to be hard coded in SW during implementation.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

### CONTROL PANEL SIGNALS

#### LOCAL CONTROL PANEL SIGNALS

ID:CDP-CIRD-41670

For the Local Control Panel LCP 1LH, the CDP **shall** set the DRIVE [FWD/ AFT] indicator to the state as mentioned below:

* FWD when LCP1LH\_TGLS\_Drive\_FWD is TRUE
* AFT when LCP1LH\_TGLS\_Drive\_AFT is TRUE
* INVALID when LCP1LH\_TGLS\_Drive\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41672

For the Local Control Panel LCP 1LH, the CDP **shall** set the PANEL ENABLED indicator to the state as mentioned below:

* ENABLED when LCP1LH\_LED\_Panel\_Enabled is TRUE
* DISABLED when LCP1LH\_LED\_Panel\_Enabled is FALSE
* INVALID when LCP1LH\_LED\_Panel\_Enabled\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41673

For the Local Control Panel LCP 1LH, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when LCP1LH\_PB\_PDU\_Stop is TRUE
* OFF when LCP1LH\_PB\_PDU\_Stop is FALSE
* INVALID when LCP1LH\_PB\_PDU\_Stop is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41674

For the Local Control Panel LCP 1LH, the CDP **shall** set the DUAL LANE indicator to the state as mentioned below:

* ENABLED when LCP1LH\_PB\_Dual\_Lane\_LED is TRUE
* DISABLED when LCP1LH\_PB\_Dual\_Lane\_LED is FALSE
* INVALID when LCP1LH\_PB\_Dual\_Lane is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41675

For the Local Control Panel LCP 1LH, the CDP **shall** set the UNLOCK NEXT indicator to the state as mentioned below:

* ENABLED when LCP1LH\_PB\_Unlock\_Next\_LED is TRUE
* DISABLED when LCP1LH\_PB\_Unlock\_Next\_LED is FALSE
* INVALID when LCP1LH\_PB\_Unlock\_Next is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41676

For the Local Control Panel LCP 1RH, the CDP **shall** set the DRIVE [FWD/ AFT] indicator to the state as mentioned below:

* FWD when LCP1RH\_TGLS\_Drive\_FWD is TRUE
* AFT when LCP1RH\_TGLS\_Drive\_AFT is TRUE
* INVALID when LCP1RH\_TGLS\_Drive\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41677

For the Local Control Panel LCP 1RH, the CDP **shall** set the PANEL ENABLED indicator to the state as mentioned below:

* ENABLED when LCP1RH\_LED\_Panel\_Enabled is TRUE
* DISABLED when LCP1RH\_LED\_Panel\_Enabled is FALSE
* INVALID when LCP1RH\_LED\_Panel\_Enabled\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41678

For the Local Control Panel LCP 1RH, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when LCP1RH\_PB\_PDU\_Stop is TRUE
* OFF when LCP1RH\_PB\_PDU\_Stop is FALSE
* INVALID when LCP1RH\_PB\_PDU\_Stop\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41680

For the Local Control Panel LCP 1RH, the CDP **shall** set the DUAL LANE indicator to the state as mentioned below:

* ENABLED when LCP1RH\_PB\_Dual\_Lane\_LED is TRUE
* DISABLED when LCP1RH\_PB\_Dual\_Lane\_LED is FALSE
* INVALID when LCP1RH\_PB\_Dual\_Lane\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41906

For the Local Control Panel LCP 1RH, the CDP **shall** set the UNLOCK NEXT indicator to the state as mentioned below:

* ENABLED when LCP1RH\_PB\_Unlock\_Next\_LED is TRUE
* DISABLED when LCP1RH\_PB\_Unlock\_Next\_LED is FALSE
* INVALID when LCP1RH\_PB\_Unlock\_Next\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41907

For the Local Control Panel LCP 2LH, the CDP **shall** set the DRIVE [FWD/ AFT] indicator to the state as mentioned below:

* FWD when LCP2LH\_TGLS\_Drive\_FWD is TRUE
* AFT when LCP2LH\_TGLS\_Drive\_AFT is TRUE
* INVALID when LCP2LH\_TGLS\_Drive\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41908

For the Local Control Panel LCP 2LH, the CDP **shall** set the PANEL ENABLED indicator to the state as mentioned below:

* ENABLED when LCP2LH\_LED\_Panel\_Enabled is TRUE
* DISABLED when LCP2LH\_LED\_Panel\_Enabled is FALSE
* INVALID when LCP2LH\_LED\_Panel\_Enabled\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41909

For the Local Control Panel LCP 2LH, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when LCP2LH\_PB\_PDU\_Stop is TRUE
* OFF when LCP2LH\_PB\_PDU\_Stop is FALSE
* INVALID when LCP2LH\_PB\_PDU\_Stop\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41910

For the Local Control Panel LCP 2LH, the CDP **shall** set the DUAL LANE indicator to the state as mentioned below:

* ENABLED when LCP2LH\_PB\_Dual\_Lane\_LED is TRUE
* DISABLED when LCP2LH\_PB\_Dual\_Lane\_LED is FALSE
* INVALID when LCP2LH\_PB\_Dual\_Lane\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41911

For the Local Control Panel LCP 2LH, the CDP **shall** set the UNLOCK NEXT indicator to the state as mentioned below:

* ENABLED when LCP2LH\_PB\_Unlock\_Next\_LED is TRUE
* DISABLED when LCP2LH\_PB\_Unlock\_Next\_LED is FALSE
* INVALID when LCP2LH\_PB\_Unlock\_Next\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41912

For the Local Control Panel LCP 2RH, the CDP **shall** set the DRIVE [FWD/ AFT] indicator to the state as mentioned below:

* FWD when LCP2RH\_TGLS\_Drive\_FWD is TRUE
* AFT when LCP2RH\_TGLS\_Drive\_AFT is TRUE
* INVALID when LCP2RH\_TGLS\_Drive\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41913

For the Local Control Panel LCP 2RH, the CDP **shall** set the PANEL ENABLED indicator to the state as mentioned below:

* ENABLED when LCP2RH\_LED\_Panel\_Enabled is TRUE
* DISABLED when LCP2RH\_LED\_Panel\_Enabled is FALSE
* INVALID when LCP2RH\_LED\_Panel\_Enabled\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41921

For the Local Control Panel LCP 2RH, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when LCP2RH\_PB\_PDU\_Stop is TRUE
* OFF when LCP2RH\_PB\_PDU\_Stop is FALSE
* INVALID when LCP2RH\_PB\_PDU\_Stop\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41922

For the Local Control Panel LCP 2RH, the CDP **shall** set the DUAL LANE indicator to the state as mentioned below:

* ENABLED when LCP2RH\_PB\_Dual\_Lane is TRUE
* DISABLED when LCP2RH\_PB\_Dual\_Lane is FALSE
* INVALID when LCP2RH\_PB\_Dual\_Lane\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41978

For the Local Control Panel LCP 2RH, the CDP **shall** set the UNLOCK NEXT indicator to the state as mentioned below:

* ENABLED when LCP2RH\_PB\_Unlock\_Next is TRUE
* DISABLED when LCP2RH\_PB\_Unlock\_Next is FALSE
* INVALID when LCP2RH\_PB\_Unlock\_Next\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41979

For the Local Control Panel LCP 3LH, the CDP **shall** set the DRIVE [FWD/ AFT] indicator to the state as mentioned below:

* FWD when LCP3LH\_TGLS\_Drive\_FWD is TRUE
* AFT when LCP3LH\_TGLS\_Drive\_AFT is TRUE
* INVALID when LCP3LH\_TGLS\_Drive\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41980

For the Local Control Panel LCP 3LH, the CDP **shall** set the PANEL ENABLED indicator to the state as mentioned below:

* ENABLED when LCP3LH\_LED\_Panel\_Enabled is TRUE
* DISABLED when LCP3LH\_LED\_Panel\_Enabled is FALSE
* INVALID when LCP3LH\_LED\_Panel\_Enabled\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41981

For the Local Control Panel LCP 3LH, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when LCP3LH\_PB\_PDU\_Stop is TRUE
* OFF when LCP3LH\_PB\_PDU\_Stop is FALSE
* INVALID when LCP3LH\_PB\_PDU\_Stop\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41982

For the Local Control Panel LCP 3LH, the CDP **shall** set the DUAL LANE indicator to the state as mentioned below:

* ENABLED when LCP3LH\_PB\_Dual\_Lane\_LED is TRUE
* DISABLED when LCP3LH\_PB\_Dual\_Lane\_LED is FALSE
* INVALID when LCP3LH\_PB\_Dual\_Lane\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41983

For the Local Control Panel LCP 3LH, the CDP **shall** set the UNLOCK NEXT indicator to the state as mentioned below:

* ENABLED when LCP3LH\_PB\_Unlock\_Next\_LED is TRUE
* DISABLED when LCP3LH\_PB\_Unlock\_Next\_LED is FALSE
* INVALID when LCP3LH\_PB\_Unlock\_Next\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41984

For the Local Control Panel LCP 3RH, the CDP **shall** set the DRIVE [FWD/ AFT] indicator to the state as mentioned below:

* FWD when LCP3RH\_TGLS\_Drive\_FWD is TRUE
* AFT when LCP3RH\_TGLS\_Drive\_AFT is TRUE
* INVALID when LCP3RH\_TGLS\_Drive\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41985

For the Local Control Panel LCP 3RH, the CDP **shall** set the PANEL ENABLED indicator to the state as mentioned below:

* ENABLED when LCP3RH\_LED\_Panel\_Enabled is TRUE
* DISABLED when LCP3RH\_LED\_Panel\_Enabled is FALSE
* INVALID when LCP3RH\_LED\_Panel\_Enabled\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41986

For the Local Control Panel LCP 3RH, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when LCP3RH\_PB\_PDU\_Stop is TRUE
* OFF when LCP3RH\_PB\_PDU\_Stop is FALSE
* INVALID when LCP3RH\_PB\_PDU\_Stop\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41987

For the Local Control Panel LCP 3RH, the CDP **shall** set the DUAL LANE indicator to the state as mentioned below:

* ENABLED when LCP3RH\_PB\_Dual\_Lane\_LED is TRUE
* DISABLED when LCP3RH\_PB\_Dual\_Lane\_LED is FALSE
* INVALID when LCP3RH\_PB\_Dual\_Lane\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41988

For the Local Control Panel LCP 3RH, the CDP **shall** set the UNLOCK NEXT indicator to the state as mentioned below:

* ENABLED when LCP3RH\_PB\_Unlock\_Next\_LED is TRUE
* DISABLED when LCP3RH\_PB\_Unlock\_Next\_LED is FALSE
* INVALID when LCP3RH\_PB\_Unlock\_Next\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41989

For the Local Control Panel LCP 4LH, the CDP **shall** set the DRIVE [FWD/ AFT] indicator to the state as mentioned below:

* FWD when LCP4LH\_TGLS\_Drive\_FWD is TRUE
* AFT when LCP4LH\_TGLS\_Drive\_AFT is TRUE
* INVALID when LCP4LH\_TGLS\_Drive\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41991

For the Local Control Panel LCP 4LH, the CDP **shall** set the PANEL ENABLED indicator to the state as mentioned below:

* ENABLED when LCP4LH\_LED\_Panel\_Enabled is TRUE
* DISABLED when LCP4LH\_LED\_Panel\_Enabled is FALSE
* INVALID when LCP4LH\_LED\_Panel\_Enabled\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41992

For the Local Control Panel LCP 4LH, the CDP **shall** set the TGL SW L/R indicator to the state as mentioned below:

* LEFT when LCP4LH\_TGLS\_L\_R\_LEFT is TRUE
* RIGHT when LCP4LH\_TGLS\_L\_R\_RIGHT is TRUE
* INVALID when LCP4LH\_TGLS\_L\_R\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41993

For the Local Control Panel LCP 4LH, the CDP **shall** set the 20FT IN OUT indicator to the state as mentioned below:

* IN CMD when LCP4LH\_TGLS\_20FT\_IN is TRUE
* OUT CMD when LCP4LH\_TGLS\_20FT\_OUT is TRUE
* INVALID when LCP4LH\_TGLS\_20FT\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41994

For the Local Control Panel LCP 4LH, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when LCP4LH\_PB\_PDU\_Stop is TRUE
* OFF when LCP4LH\_PB\_PDU\_Stop is FALSE
* INVALID when LCP4LH\_PB\_PDU\_Stop\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41995

For the Local Control Panel LCP 4LH, the CDP **shall** set the DUAL LANE indicator to the state as mentioned below:

* ENABLED when LCP4LH\_PB\_Dual\_Lane\_LED is TRUE
* DISABLED when LCP4LH\_PB\_Dual\_Lane\_LED is FALSE
* INVALID when LCP4LH\_PB\_Dual\_Lane\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41996

For the Local Control Panel LCP 4LH, the CDP **shall** set the UNLOCK NEXT indicator to the state as mentioned below:

* ENABLED when LCP4LH\_PB\_Unlock\_Next\_LED is TRUE
* DISABLED when LCP4LH\_PB\_Unlock\_Next\_LED is FALSE
* INVALID when LCP4LH\_PB\_Unlock\_Next\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41997

For the Local Control Panel LCP 4RH, the CDP **shall** set the DRIVE [FWD/ AFT] indicator to the state as mentioned below:

* FWD when LCP4RH\_TGLS\_Drive\_FWD is TRUE
* AFT when LCP4RH\_TGLS\_Drive\_AFT is TRUE
* INVALID when LCP4RH\_TGLS\_Drive\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41998

For the Local Control Panel LCP 4RH, the CDP **shall** set the PANEL ENABLED indicator to the state as mentioned below:

* ENABLED when LCP4RH\_LED\_Panel\_Enabled is TRUE
* DISABLED when LCP4RH\_LED\_Panel\_Enabled is FALSE
* INVALID when LCP4RH\_LED\_Panel\_Enabled\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-41999

For the Local Control Panel LCP 4RH, the CDP **shall** set the TGL SW L/R indicator to the state as mentioned below:

* LEFT when LCP4RH\_TGLS\_L\_R\_LEFT is TRUE
* RIGHT when LCP4RH\_TGLS\_L\_R\_RIGHT is TRUE
* INVALID when LCP4RH\_TGLS\_L\_R\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42000

For the Local Control Panel LCP 4RH, the CDP **shall** set the 20FT IN OUT indicator to the state as mentioned below:

* IN CMD when LCP4RH\_TGLS\_20FT\_IN is TRUE
* OUT CMD when LCP4RH\_TGLS\_20FT\_OUT is TRUE
* INVALID when LCP4RH\_TGLS\_20FT\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42001

For the Local Control Panel LCP 4RH, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when LCP4RH\_PB\_PDU\_Stop is TRUE
* OFF when LCP4RH\_PB\_PDU\_Stop is FALSE
* INVALID when LCP4RH\_PB\_PDU\_Stop\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42002

For the Local Control Panel LCP 4RH, the CDP **shall** set the DUAL LANE indicator to the state as mentioned below:

* ENABLED when LCP4RH\_PB\_Dual\_Lane\_LED is TRUE
* DISABLED when LCP4RH\_PB\_Dual\_Lane\_LED is FALSE
* INVALID when LCP4RH\_PB\_Dual\_Lane\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42003

For the Local Control Panel LCP 4RH, the CDP **shall** set the UNLOCK NEXT indicator to the state as mentioned below:

* ENABLED when LCP4RH\_PB\_Unlock\_Next\_LED is TRUE
* DISABLED when LCP4RH\_PB\_Unlock\_Next\_LED is FALSE
* INVALID when LCP4RH\_PB\_Unlock\_Next\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84372

For each of the Local Control Panels, the CDP **shall** set the Panel Status indicator to the enumerated value of the respective signal mentioned below as defined in the CAN ICD Rpt 11594

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **LCP** | **SIGNAL NAME** |
| LCP 1 LH | LCP1LH\_Panel\_Status |
| LCP 1 RH | LCP1RH\_Panel\_Status |
| LCP 2 LH | LCP2LH\_Panel\_Status |
| LCP 2 RH | LCP2RH\_Panel\_Status |
| LCP 3 LH | LCP3LH\_Panel\_Status |
| LCP 3 RH | LCP3RH\_Panel\_Status |
| LCP 4 LH | LCP4LH\_Panel\_Status |
| LCP 4 RH | LCP4RH\_Panel\_Status |

Table - Panel\_Status signal on each LCP

ID:CDP-CIRD-84374

For each of the Local Control Panels, the CDP **shall** set the Mux Current/ Voltage to the enumerated value of respective signal mentioned below as defined in CAN ICD Rpt 11594.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **LCP** | **SIGNAL NAME** |
| LCP 1 LH | LCP1LH\_Mux\_Current\_Voltage |
| LCP 1 RH | LCP1RH\_Mux\_Current\_Voltage |
| LCP 2 LH | LCP2LH\_Mux\_Current\_Voltage |
| LCP 2 RH | LCP2RH\_Mux\_Current\_Voltage |
| LCP 3 LH | LCP3LH\_Mux\_Current\_Voltage |
| LCP 3 RH | LCP3RH\_Mux\_Current\_Voltage |
| LCP 4 LH | LCP4LH\_Mux\_Current\_Voltage |
| LCP 4 RH | LCP4RH\_Mux\_Current\_Voltage |

Table - Mux\_Current\_Voltage signal for each LCP

ID:CDP-CIRD-84377

For each of the Local Control Panels, the CDP **shall** set the Measured Current/ Voltage to the value of respective signal mentioned below.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **LCP** | **SIGNAL NAME** |
| LCP 1 LH | LCP1LH\_Measured\_Current\_Voltage |
| LCP 1 RH | LCP1RH\_Measured\_Current\_Voltage |
| LCP 2 LH | LCP2LH\_Measured\_Current\_Voltage |
| LCP 2 RH | LCP2RH\_Measured\_Current\_Voltage |
| LCP 3 LH | LCP3LH\_Measured\_Current\_Voltage |
| LCP 3 RH | LCP3RH\_Measured\_Current\_Voltage |
| LCP 4 LH | LCP4LH\_Measured\_Current\_Voltage |
| LCP 4 RH | LCP4RH\_Measured\_Current\_Voltage |

Table - Measured\_Current\_Voltage Signal on each LCP

ID:CDP-CIRD-84386

For each of the Local Control Panels, the CDP **shall** map the faults listed in the below table in column "Faults" to the respective Fault Signal listed in column "Fault Signal" and sets the Fault to True if the Fault Signal is received as 1 or to False otherwise.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |  |
| --- | --- | --- |
| **LCP** | **Faults** | **Fault Signal** |
| **LCP 1 LH** | LCP1LH Switch Fault Status | LCP1LH\_Switch\_Fault\_Status |
| LCP1LH Push Button-PDU Stop Fault | LCP1LH\_PB\_PDU\_Stop\_Fault |
| LCP1LH Toggle Switch-Drive Fault | LCP1LH\_TGLS\_Drive\_Fault |
| LCP1LH Push Button-Dual Lane Fault | LCP1LH\_PB\_Dual\_Lane\_Fault |
| LCP1LH Push Button-Unlock Next Fault | LCP1LH\_PB\_Unlock\_Next\_Fault |
| LCP1LH Push Button-Lamp Test Fault | LCP1LH\_PB\_Lamp\_Test\_Fault |
| LCP1LH LED Panel Enabled Fault | LCP1LH\_LED\_Panel\_Enabled\_Fault |
|  |  |  |
| **LCP1RH** | LCP1RH Switch Fault Status | LCP1RH\_Switch\_Fault\_Status |
| LCP1RH Push Button-PDU Stop Fault | LCP1RH\_PB\_PDU\_Stop\_Fault |
| LCP1RH Toggle Switch-Drive Fault | LCP1RH\_TGLS\_Drive\_Fault |
| LCP1RH Push Button-Dual Lane Fault | LCP1RH\_PB\_Dual\_Lane\_Fault |
| LCP1RH Push Button-Unlock Next Fault | LCP1RH\_PB\_Unlock\_Next\_Fault |
| LCP1RH Push Button-Lamp Test Fault | LCP1RH\_PB\_Lamp\_Test\_Fault |
| LCP1RH LED Panel Enabled Fault | LCP1RH\_LED\_Panel\_Enabled\_Fault |
|  |  |  |
| **LCP2LH** | LCP2LH Switch Fault Status | LCP2LH\_Switch\_Fault\_Status |
| LCP2LH Push Button-PDU Stop Fault | LCP2LH\_PB\_PDU\_Stop\_Fault |
| LCP2LH Toggle Switch-Drive Fault | LCP2LH\_TGLS\_Drive\_Fault |
| LCP2LH Push Button-Dual Lane Fault | LCP2LH\_PB\_Dual\_Lane\_Fault |
| LCP2LH Push Button-Unlock Next Fault | LCP2LH\_PB\_Unlock\_Next\_Fault |
| LCP2LH Push Button-Lamp Test Fault | LCP2LH\_PB\_Lamp\_Test\_Fault |
| LCP2LH LED Panel Enabled Fault | LCP2LH\_LED\_Panel\_Enabled\_Fault |
|  |  |  |
| **LCP2RH** | LCP2RH Switch Fault Status | LCP2RH\_Switch\_Fault\_Status |
| LCP2RH Push Button-PDU Stop Fault | LCP2RH\_PB\_PDU\_Stop\_Fault |
| LCP2RH Toggle Switch-Drive Fault | LCP2RH\_TGLS\_Drive\_Fault |
| LCP2RH Push Button-Dual Lane Fault | LCP2RH\_PB\_Dual\_Lane\_Fault |
| LCP2RH Push Button-Unlock Next Fault | LCP2RH\_PB\_Unlock\_Next\_Fault |
| LCP2RH Push Button-Lamp Test Fault | LCP2RH\_PB\_Lamp\_Test\_Fault |
| LCP2RH LED Panel Enabled Fault | LCP2RH\_LED\_Panel\_Enabled\_Fault |
|  |  |  |
| **LCP 3LH** | LCP3LH Switch Fault Status | LCP3LH\_Switch\_Fault\_Status |
| LCP3LH Push Button-PDU Stop Fault | LCP3LH\_PB\_PDU\_Stop\_Fault |
| LCP3LH Toggle Switch-Drive Fault | LCP3LH\_TGLS\_Drive\_Fault |
| LCP3LH Push Button-Dual Lane Fault | LCP3LH\_PB\_Dual\_Lane\_Fault |
| LCP3LH Push Button-Unlock Next Fault | LCP3LH\_PB\_Unlock\_Next\_Fault |
| LCP3LH Push Button-Lamp Test Fault | LCP3LH\_PB\_Lamp\_Test\_Fault |
| LCP3LH LED Panel Enabled Fault | LCP3LH\_LED\_Panel\_Enabled\_Fault |
|  |  |  |
| **LCP 3RH** | LCP3RH Switch Fault Status | LCP3RH\_Switch\_Fault\_Status |
| LCP3RH Push Button-PDU Stop Fault | LCP3RH\_PB\_PDU\_Stop\_Fault |
| LCP3RH Toggle Switch-Drive Fault | LCP3RH\_TGLS\_Drive\_Fault |
| LCP3RH Push Button-Dual Lane Fault | LCP3RH\_PB\_Dual\_Lane\_Fault |
| LCP3RH Push Button-Unlock Next Fault | LCP3RH\_PB\_Unlock\_Next\_Fault |
| LCP3RH Push Button-Lamp Test Fault | LCP3RH\_PB\_Lamp\_Test\_Fault |
| LCP3RH LED Panel Enabled Fault | LCP3RH\_LED\_Panel\_Enabled\_Fault |
|  |  |  |
| **LCP 4LH** | LCP4LH Switch Fault Status | LCP4LH\_Switch\_Fault\_Status |
| LCP4LH Push Button-PDU Stop Fault | LCP4LH\_PB\_PDU\_Stop\_Fault |
| LCP4LH Toggle Switch-Drive Fault | LCP4LH\_TGLS\_Drive\_Fault |
| LCP4LH Toggle Switch-L/R Fault | LCP4LH\_TGLS\_L\_R\_Fault |
| LCP4LH Toggle Switch-20FT Fault | LCP4LH\_TGLS\_20FT\_Fault |
| LCP4LH Push Button-Dual Lane Fault | LCP4LH\_PB\_Dual\_Lane\_Fault |
| LCP4LH Push Button-Unlock Next Fault | LCP4LH\_PB\_Unlock\_Next\_Fault |
| LCP4LH Push Button-Lamp Test Fault | LCP4LH\_PB\_Lamp\_Test\_Fault |
| LCP4LH LED Panel Enabled Fault | LCP4LH\_LED\_Panel\_Enabled\_Fault |
|  |  |  |
| **LCP 4RH** | LCP4RH Switch Fault Status | LCP4RH\_Switch\_Fault\_Status |
| LCP4RH Push Button-PDU Stop Fault | LCP4RH\_PB\_PDU\_Stop\_Fault |
| LCP4RH Toggle Switch-Drive Fault | LCP4RH\_TGLS\_Drive\_Fault |
| LCP4RH Toggle Switch-L/R Fault | LCP4RH\_TGLS\_L\_R\_Fault |
| LCP4RH Toggle Switch-20FT Fault | LCP4RH\_TGLS\_20FT\_Fault |
| LCP4RH Push Button-Dual Lane Fault | LCP4RH\_PB\_Dual\_Lane\_Fault |
| LCP4RH Push Button-Unlock Next Fault | LCP4RH\_PB\_Unlock\_Next\_Fault |
| LCP4RH Push Button-Lamp Test Fault | LCP4RH\_PB\_Lamp\_Test\_Fault |
| LCP4RH LED Panel Enabled Fault | LCP4RH\_LED\_Panel\_Enabled\_Fault |

Table - LCP Faults to signal mapping

#### MASTER CONTROL PANEL SIGNALS

ID:CDP-CIRD-42008

For the Master Control Panel, the CDP **shall** set the ON/OFF indicator to the state as mentioned below:

* ON when MCP\_PB\_On\_Off\_LED is TRUE
* OFF when MCP\_PB\_On\_Off\_LED is FALSE
* INVALID when MCP\_PB\_Power\_On\_Off\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42009

For the Master Control Panel, the CDP **shall** set the JOYSTICK indicator to the state as mentioned below:

* AFT when MCP\_Joystick\_AFT is TRUE
* FWD when MCP\_Joystick\_FWD is TRUE
* IN CMD when MCP\_Joystick\_IN is TRUE
* OUT CMD when MCP\_Joystick\_OUT is TRUE
* NEUTRAL when MCP\_Joystick\_NEUTRAL is TRUE
* INVALID when MCP\_Joystick\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42010

For the Master Control Panel, the CDP **shall** set the ZONE indicator to the state as mentioned below:

* AFT when MCP\_PB\_Zone\_Select\_AFT\_LED is TRUE
* FWD when MCP\_PB\_Zone\_Select\_FWD\_LED is TRUE
* INVALID when
  + MCP\_PB\_Zone\_Select\_AFT\_LED is TRUE AND MCP\_PB\_Zone\_Select\_AFT\_Fault is TRUE OR
  + MCP\_PB\_Zone\_Select\_FWD\_LED is TRUE AND MCP\_PB\_Zone\_Select\_FWD\_Fault is TRUE OR
  + Both MCP\_PB\_Zone\_Select\_AFT\_LED and MCP\_PB\_Zone\_Select\_FWD\_LED are TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42011

For the Master Control Panel, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when MCP\_PB\_PDU\_Stop is TRUE
* OFF when MCP\_PB\_PDU\_Stop is FALSE
* INVALID when MCP\_PB\_PDU\_Stop\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42012

For the Master Control Panel, the CDP **shall** set the SYSTEM ACTIVE indicator to the state as mentioned below:

* ACTIVE when MCP\_LED\_System\_Active is TRUE
* INACTIVE when MCP\_LED\_System\_Active is FALSE
* INVALID when MCP\_LED\_System\_Active\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42013

For the Master Control Panel, the CDP **shall** set the SPIN indicator to the state as mentioned below:

* ENABLED when MCP\_PB\_Spin\_LED is TRUE
* DISABLED when MCP\_PB\_Spin\_LED is FALSE
* INVALID when MCP\_PB\_Spin\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42014

For the Master Control Panel, the CDP **shall** set the SIDE SELECT indicator to the state as mentioned below:

* LEFT when MCP\_PB\_Side\_Select\_Left\_LED is TRUE
* RIGHT when MCP\_PB\_Side\_Select\_Right\_LED is TRUE
* BOTH when MCP\_PB\_Side\_Select\_Left\_LED  AND MCP\_PB\_Side\_Select\_Right\_LED are TRUE
* INVALID when
  + MCP\_PB\_Side\_Select\_Left\_LED is TRUE AND MCP\_PB\_Side\_Select\_Left\_Fault is TRUE OR
  + MCP\_PB\_Side\_Select\_Right\_LED is TRUE and MCP\_PB\_Side\_Select\_Right\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42017

For the Master Control Panel, the CDP **shall** set the 20FT indicator to the state as mentioned below:

* ENABLED when MCP\_PB\_20FT\_LED is TRUE
* DISABLED when MCP\_PB\_20FT\_LED is FALSE
* INVALID when MCP\_PB\_20FT\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42020

For the Master Control Panel, the CDP **shall** set the DUAL OPERATOR indicator to the state as mentioned below:

* ENABLED when MCP\_PB\_Dual\_Operator\_LED is TRUE
* DISABLED when MCP\_PB\_Dual\_Operator\_LED is FALSE
* INVALID when MCP\_PB\_Dual\_Operator\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42021

For the Master Control Panel, the CDP **shall** set the 20FT IN OUT indicator to the state as mentioned below:

* OUT CMD when MCP\_TGLS\_20FT\_OUT is TRUE
* IN CMD when MCP\_TGLS\_20FT\_IN is TRUE
* INVALID when MCP\_TGLS\_20FT\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42022

For the Master Control Panel, the CDP **shall** set the LCP ACTIVE LH2/1 indicator to the state as mentioned below:

* ACTIVE when MCP\_PB\_LCP\_LH2\_1\_Enable\_LED  is TRUE
* INACTIVE when MCP\_PB\_LCP\_LH2\_1\_Enable\_LED is FALSE
* INVALID when MCP\_PB\_LCP\_LH2\_1\_Enable\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42023

For the Master Control Panel, the CDP **shall** set the LCP ACTIVE LH4/3 indicator to the state as mentioned below:

* ACTIVE when MCP\_PB\_LCP\_LH4\_3\_Enable\_LED is TRUE
* INACTIVE when MCP\_PB\_LCP\_LH4\_3\_Enable\_LED is FALSE
* INVALID when MCP\_PB\_LCP\_LH4\_3\_Enable\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42024

For the Master Control Panel, the CDP **shall** set the LCP ACTIVE RH2/1 indicator to the state as mentioned below:

* ACTIVE when MCP\_PB\_LCP\_RH2\_1\_Enable\_LED is TRUE
* INACTIVE when MCP\_PB\_LCP\_RH2\_1\_Enable\_LED is FALSE
* INVALID when MCP\_PB\_LCP\_RH2\_1\_Enable\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42025

For the Master Control Panel, the CDP **shall** set the LCP ACTIVE RH4/3 indicator to the state as mentioned below:

* ACTIVE when MCP\_PB\_LCP\_RH4\_3\_Enable\_LED is TRUE
* INACTIVE when MCP\_PB\_LCP\_RH4\_3\_Enable\_LED is FALSE
* INVALID when MCP\_PB\_LCP\_RH4\_3\_Enable\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84319

For the Master Control Panel, the CDP **shall** set the Panel Status indicator to the enumerated value of MCP\_Panel\_Status as defined in the CAN ICD Rpt 11594

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84320

For the Master Control Panel, the CDP **shall** set the Mux Current/ Voltage to the enumerated value of MCP\_Mux\_Current\_Voltage as defined in CAN ICD Rpt 11594.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84321

For the Master Control Panel, the CDP **shall** set the Measured Current/ Voltage indicator to MCP\_Measured\_Current\_Voltage.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84322

For the Master Control Panel, the CDP **shall** map the faults listed in the below table in column "Faults" to the Fault Signal listed in column "Fault Signal" and sets the Fault to True if the Fault Signal is received as 1 or to False otherwise.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **Faults** | **Fault Signal** |
| MCP Switch Fault Status | MCP\_Switch\_Fault\_Status |
| MCP Push Button-Power On Off Fault | MCP\_PB\_Power\_On\_Off\_Fault |
| MCP Push Button-PDU Stop Fault | MCP\_PB\_PDU\_Stop\_Fault |
| MCP Push Button-Side Select Left Fault | MCP\_PB\_Side\_Select\_Left\_Fault |
| MCP Push Button-Side Select Right Fault | MCP\_PB\_Side\_Select\_Right\_Fault |
| MCP Push Button-Zone Select AFT Fault | MCP\_PB\_Zone\_Select\_AFT\_Fault |
| MCP Push Button-Zone Select FWD Fault | MCP\_PB\_Zone\_Select\_FWD\_Fault |
| MCP Push Button-LCP LH2 1 Enable Fault | MCP\_PB\_LCP\_LH2\_1\_Enable\_Fault |
| MCP Push Button-LCP LH4 3 Enable Fault | MCP\_PB\_LCP\_LH4\_3\_Enable\_Fault |
| MCP Push Button-LCP RH2 1 Enable Fault | MCP\_PB\_LCP\_RH2\_1\_Enable\_Fault |
| MCP Push Button-LCP RH4 3 Enable Fault | MCP\_PB\_LCP\_RH4\_3\_Enable\_Fault |
| MCP Push Button-Dual Operator Fault | MCP\_PB\_Dual\_Operator\_Fault |
| MCP Push Button-20FT Fault | MCP\_PB\_20FT\_Fault |
| MCP Push Button-Spin Fault | MCP\_PB\_Spin\_Fault |
| MCP Push Button-Lamp Test Fault | MCP\_PB\_Lamp\_Test\_Fault |
| MCP Joystick Fault | MCP\_Joystick\_Fault |
| MCP Toggle Switch-20FT Fault | MCP\_TGLS\_20FT\_Fault |
| MCP LED System Active Fault | MCP\_LED\_System\_Active\_Fault |

Table - MCP faults to signal mapping

#### INSIDE CONTROL PANEL SIGNALS

ID:CDP-CIRD-42026

For the Inside Control Panel, the CDP **shall** set the ON/OFF indicator to the state as mentioned below:

* ON when ICP\_PB\_On\_Off\_LED is TRUE
* OFF when ICP\_PB\_On\_Off\_LED is FALSE
* INVALID when ICP\_PB\_Power\_On\_Off\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42027

For the Inside Control Panel, the CDP **shall** set the JOYSTICK indicator to the following state indicator to the state as mentioned below:

* AFT when ICP\_Joystick\_AFT is TRUE
* FWD when ICP\_Joystick\_FWD is TRUE
* IN CMD when ICP\_Joystick\_IN is TRUE
* OUT CMD when ICP\_Joystick\_OUT is TRUE
* NEUTRAL when ICP\_Joystick\_NEUTRAL is TRUE
* INVALID when ICP\_Joystick\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42029

For the Inside Control Panel, the CDP **shall** set the ZONE indicator to the state as mentioned below:

* AFT when ICP\_PB\_Zone\_Select\_AFT\_LED is TRUE
* FWD when ICP\_PB\_Zone\_Select\_FWD\_LED is TRUE
* INVALID when
  + ICP\_PB\_Zone\_Select\_AFT\_LED  is TRUE AND ICP\_PB\_Zone\_Select\_AFT\_Fault is TRUE OR
  + ICP\_PB\_Zone\_Select\_FWD\_LED is TRUE AND ICP\_PB\_Zone\_Select\_FWD\_Fault is TRUE OR
  + Both ICP\_PB\_Zone\_Select\_AFT\_LED and ICP\_PB\_Zone\_Select\_FWD\_LED are TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42031

For the Inside Control Panel, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when ICP\_PDU\_Stop is TRUE
* OFF when ICP\_PDU\_Stop is FALSE
* INVALID when ICP\_PB\_PDU\_Stop\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42032

For the Inside Control Panel, the CDP **shall** set the SYSTEM ACTIVE indicator to the state as mentioned below:

* ACTIVE when ICP\_LED\_System\_Active is TRUE
* INACTIVE when ICP\_LED\_System\_Active is FALSE
* INVALID when ICP\_LED\_System\_Active\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42033

For the Inside Control Panel, the CDP **shall** set the SPIN indicator to the state as mentioned below:

* ENABLED when ICP\_PB\_Spin\_LED is TRUE
* DISABLED when ICP\_PB\_Spin\_LED is FALSE
* INVALID when ICP\_PB\_Spin\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42034

For the Inside Control Panel, the CDP **shall** set the SIDE SELECT indicator to the state as mentioned below:

* LEFT when ICP\_PB\_Side\_Select\_Left\_LED is TRUE
* RIGHT when ICP\_PB\_Side\_Select\_Right\_LED is TRUE
* BOTH when ICP\_PB\_Side\_Select\_Left\_LED  AND ICP\_PB\_Side\_Select\_Right\_LED are TRUE
* INVALID when
  + ICP\_PB\_Side\_Select\_Left\_LED is TRUE AND ICP\_PB\_Side\_Select\_Left\_Fault is TRUE OR
  + ICP\_PB\_Side\_Select\_Right\_LED is TRUE AND ICP\_PB\_Side\_Select\_Right\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42035

For the Inside Control Panel, the CDP **shall** set the 20FT indicator to the state as mentioned below:

* ENABLED when ICP\_PB\_20FT\_LED is TRUE
* DISABLED when ICP\_PB\_20FT\_LED is FALSE
* INVALID when ICP\_PB\_20FT\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42036

For the Inside Control Panel, the CDP **shall** set the DUAL OPERATOR indicator to the state as mentioned below:

* ENABLED when ICP\_PB\_Dual\_Operator\_LED is TRUE
* DISABLED when ICP\_PB\_Dual\_Operator\_LED is FALSE
* INVALID when ICP\_PB\_Dual\_Operator\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42037

For the Inside Control Panel, the CDP **shall** set the 20FT IN OUT indicator to the state as mentioned below:

* OUT CMD when ICP\_TGLS\_20FT\_OUT is TRUE
* IN CMD when ICP\_TGLS\_20FT\_IN is TRUE
* INVALID when ICP\_TGLS\_20FT\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42038

For the Inside Control Panel, the CDP **shall** set the LCP ACTIVE LH2/1 indicator to the state as mentioned below:

* ACTIVE when ICP\_PB\_LCP\_LH2\_1\_Enable\_LED is TRUE
* INACTIVE when ICP\_PB\_LCP\_LH2\_1\_Enable\_LED is FALSE
* INVALID when ICP\_PB\_LCP\_LH2\_1\_Enable\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42039

For the Inside Control Panel, the CDP **shall** set the LCP ACTIVE LH4/3 indicator to the state as mentioned below:

* ACTIVE when ICP\_PB\_LCP\_LH4\_3\_Enable\_LED is TRUE
* INACTIVE when ICP\_PB\_LCP\_LH4\_3\_Enable\_LED is FALSE
* INVALID when ICP\_PB\_LCP\_LH4\_3\_Enable\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42040

For the Inside Control Panel, the CDP **shall** set the LCP ACTIVE RH2/1 indicator to the state as mentioned below:

* ACTIVE when ICP\_PB\_LCP\_RH2\_1\_Enable\_LED is TRUE
* INACTIVE when ICP\_PB\_LCP\_RH2\_1\_Enable\_LED is FALSE
* INVALID when ICP\_PB\_LCP\_RH2\_1\_Enable\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42041

For the Inside Control Panel, the CDP **shall** set the LCP ACTIVE RH4/3 indicator to the state as mentioned below:

* ACTIVE when ICP\_PB\_LCP\_RH4\_3\_Enable\_LED is TRUE
* INACTIVE when ICP\_PB\_LCP\_RH4\_3\_Enable\_LED is FALSE
* INVALID when ICP\_PB\_LCP\_RH4\_3\_Enable\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84323

For the Inside Control Panel, the CDP **shall** set the Panel Status indicator to the enumerated value of ICP\_Panel\_Status as defined in the CAN ICD Rpt 11594

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84324

For the Inside Control Panel, the CDP **shall** set the Mux Current/ Voltage to the enumerated value of ICP\_Mux\_Current\_Voltage as defined in CAN ICD Rpt 11594.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84325

For the Inside Control Panel, the CDP **shall** set the Measured Current/ Voltage indicator to ICP\_Measured\_Current\_Voltage.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84326

For the Inside Control Panel,  the CDP **shall** map the faults listed in the below table in column "Faults" to the Fault Signal listed in column "Fault Signal" and sets the Fault to True if the Fault Signal is received as 1 or to False otherwise.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **Faults** | **Fault Signal** |
| ICP Switch Fault Status | ICP\_Switch\_Fault\_Status |
| ICP Push Button-Power On Off Fault | ICP\_PB\_Power\_On\_Off\_Fault |
| ICP Push Button-PDU Stop Fault | ICP\_PB\_PDU\_Stop\_Fault |
| ICP Push Button-Side Select Left Fault | ICP\_PB\_Side\_Select\_Left\_Fault |
| ICP Push Button-Side Select Right Fault | ICP\_PB\_Side\_Select\_Right\_Fault |
| ICP Push Button-Zone Select AFT Fault | ICP\_PB\_Zone\_Select\_AFT\_Fault |
| ICP Push Button-Zone Select FWD Fault | ICP\_PB\_Zone\_Select\_FWD\_Fault |
| ICP Push Button-LCP LH2 1 Enable Fault | ICP\_PB\_LCP\_LH2\_1\_Enable\_Fault |
| ICP Push Button-LCP LH4 3 Enable Fault | ICP\_PB\_LCP\_LH4\_3\_Enable\_Fault |
| ICP Push Button-LCP RH2 1 Enable Fault | ICP\_PB\_LCP\_RH2\_1\_Enable\_Fault |
| ICP Push Button-LCP RH4 3 Enable Fault | ICP\_PB\_LCP\_RH4\_3\_Enable\_Fault |
| ICP Push Button-Dual Operator Fault | ICP\_PB\_Dual\_Operator\_Fault |
| ICP Push Button-20FT Fault | ICP\_PB\_20FT\_Fault |
| ICP Push Button-Spin Fault | ICP\_PB\_Spin\_Fault |
| ICP Push Button-Lamp Test Fault | ICP\_PB\_Lamp\_Test\_Fault |
| ICP Joystick Fault | ICP\_Joystick\_Fault |
| ICP Toggle Switch-20FT Fault | ICP\_TGLS\_20FT\_Fault |
| ICP LED System Active Fault | ICP\_LED\_System\_Active\_Fault |

Table - ICP faults to signal mapping

#### OUTSIDE CONTROL PANEL SIGNALS

ID:CDP-CIRD-42042

For the Outside Control Panel, the CDP **shall** set the ON/OFF indicator to the state as mentioned below:

* ON when OCP\_PB\_On\_Off\_LED is TRUE
* OFF when OCP\_PB\_On\_Off\_LED is FALSE
* INVALID when OCP\_PB\_Power\_On\_Off\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42044

For the Outside Control Panel, the CDP **shall** set the ZONE indicator to the state as mentioned below:

* AFT when OCP\_PB\_Zone\_Select\_AFT\_LED is TRUE
* FWD when OCP\_PB\_Zone\_Select\_FWD\_LED is TRUE
* INVALID when
  + OCP\_PB\_Zone\_Select\_AFT\_LED  is TRUE AND OCP\_PB\_Zone\_Select\_AFT\_Fault is TRUE OR
  + OCP\_PB\_Zone\_Select\_FWD\_LED is TRUE AND OCP\_PB\_Zone\_Select\_FWD\_Fault is TRUE OR
  + Both OCP\_PB\_Zone\_Select\_AFT\_LED and OCP\_PB\_Zone\_Select\_FWD\_LED are TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42045

For the Outside Control Panel, the CDP **shall** set the PDU STOP indicator to the state as mentioned below:

* ON when OCP\_PB\_PDU\_Stop is TRUE
* OFF when OCP\_PB\_PDU\_Stop is FALSE
* INVALID when OCP\_PB\_PDU\_Stop\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42046

For the Outside Control Panel, the CDP **shall** set the SYSTEM ACTIVE indicator to the state as mentioned below:

* ACTIVE when OCP\_LED\_System\_Active is TRUE
* INACTIVE when OCP\_LED\_System\_Active is FALSE
* INVALID when OCP\_LED\_System\_Active\_Fault is TRUE.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42047

For the Outside Control Panel, the CDP **shall** set the 20FT indicator to the state as mentioned below:

* ENABLED when OCP\_PB\_20FT\_LED is TRUE
* DISABLED when OCP\_PB\_20FT\_LED is FALSE
* INVALID when OCP\_PB\_20FT\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42048

For the Outside Control Panel, the CDP **shall** set the DUAL OPERATOR indicator to the state as mentioned below:

* ENABLED when OCP\_PB\_Dual\_Operator\_LED is TRUE
* DISABLED when OCP\_PB\_Dual\_Operator\_LED is FALSE
* INVALID when OCP\_PB\_Dual\_Operator\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42049

For the Outside Control Panel, the CDP **shall** set the 20FT IN OUT indicator to the state as mentioned below:

* OUT CMD when OCP\_TGLS\_20FT\_OUT is TRUE
* IN CMD when OCP\_TGLS\_20FT\_IN is TRUE
* INVALID when OCP\_TGLS\_20FT\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42050

For the Outside Control Panel, the CDP **shall** set the TGL SW FWD/AFT indicator to the state as mentioned below:

* FWD when OCP\_TGLS\_L\_R\_FWD is TRUE
* AFT when OCP\_TGLS\_L\_R\_AFT is TRUE
* INVALID when OCP\_TGLS\_L\_R\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42051

For the Outside Control Panel, the CDP **shall** set the TGL SW IN/OUT indicator to the state as mentioned below:

* OUT CMD when OCP\_TGLS\_IN\_OUT\_OUT is TRUE
* IN CMD when OCP\_TGLS\_IN\_OUT\_IN is TRUE
* INVALID when OCP\_TGLS\_IN\_OUT\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84367

For the Outside Control Panel, the CDP **shall** set the SIDE SELECT indicator to the state as mentioned below:

* LEFT when OCP\_PB\_Side\_Select\_Left\_LED is TRUE
* RIGHT when OCP\_PB\_Side\_Select\_Right\_LED is TRUE
* BOTH when OCP\_PB\_Side\_Select\_Left\_LED AND OCP\_PB\_Side\_Select\_Right\_LED are TRUE
* INVALID when
  + OCP\_PB\_Side\_Select\_Left\_LED is TRUE AND OCP\_PB\_Side\_Select\_Left\_Fault is TRUE OR
  + OCP\_PB\_Side\_Select\_Right\_LED is TRUE AND OCP\_PB\_Side\_Select\_Right\_Fault is TRUE

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84368

For the Outside Control Panel, the CDP **shall** set the Panel Status indicator to the enumerated value of OCP\_Panel\_Status as defined in the CAN ICD Rpt 11594

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84369

For the Outside Control Panel, the CDP **shall** set the Mux Current/ Voltage to the enumerated value of OCP\_Mux\_Current\_Voltage as defined in CAN ICD Rpt 11594.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84370

For the Outside Control Panel, the CDP **shall** set the Measured Current/ Voltage indicator to OCP\_Measured\_Current\_Voltage.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-84371

For the Outside Control Panel, the CDP **shall** map the faults listed in the below table in column "Faults" to the Fault Signal listed in column "Fault Signal" and sets the Fault to True if the Fault Signal is received as 1 or to False otherwise.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **Faults** | **Fault Signal** |
| OCP Switch Fault Status | OCP\_Switch\_Fault\_Status |
| OCP Push Button-Power On Off Fault | OCP\_PB\_Power\_On\_Off\_Fault |
| OCP Push Button-PDU Stop Fault | OCP\_PB\_PDU\_Stop\_Fault |
| OCP Push Button-Side Select Left Fault | OCP\_PB\_Side\_Select\_Left\_Fault |
| OCP Push Button-Side Select Right Fault | OCP\_PB\_Side\_Select\_Right\_Fault |
| OCP Push Button-Zone Select AFT Fault | OCP\_PB\_Zone\_Select\_AFT\_Fault |
| OCP Push Button-Zone Select FWD Fault | OCP\_PB\_Zone\_Select\_FWD\_Fault |
| OCP Toggle Switch-20FT Fault | OCP\_TGLS\_20FT\_Fault |
| OCP Push Button-Dual Operator Fault | OCP\_PB\_Dual\_Operator\_Fault |
| OCP Push Button-20FT Fault | OCP\_PB\_20FT\_Fault |
| OCP Toggle Switch-IN/OUT Fault | OCP\_TGLS\_IN\_OUT\_Fault |
| OCP Toggle Switch-L/R Fault | OCP\_TGLS\_L\_R\_Fault |
| OCP Push Button-Lamp Test Fault | OCP\_PB\_Lamp\_Test\_Fault |
| OCP LED System Active Fault | OCP\_LED\_System\_Active\_Fault |

Table - OCP faults to signal mapping

### PDU SIGNALS

This section explains the mapping of CAN signals redirected from the PDUs to the CDP indicator functions. The requirements are generic to all the PDUs as applicable and hence the Signals are mentioned as "PDU\_X\_" where X can be any of 116 PDUs defined as per the Translated Node Identifier in CAN ICD Rpt 11594.

ID:CDP-CIRD-85409

The CDP **shall** set PDU\_X\_Faults\_Abnormal to True when any of the following faults are True.

* PDU\_X\_NVM\_Fault
* PDU\_X\_HVDC\_Over\_Voltage\_Fault
* PDU\_X\_HVDC\_Under\_Voltage\_Fault
* PDU\_X\_HVDC\_Over\_Current\_Fault
* PDU\_X\_115VAC\_Phase\_Fault
* PDU\_X\_ATRU\_Right\_Coil\_Over\_Temperature\_Fault
* PDU\_X\_ATRU\_Left\_Coil\_Over\_Temperature\_Fault
* PDU\_X\_Drive\_Motor\_Over\_Temperature\_Fault
* PDU\_X\_Board\_Over\_Temperature\_Fault
* PDU\_X\_IGBT\_Onchip\_Over\_Temperature\_Fault
* PDU\_X\_IGBT\_Protection\_Trip

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-42052

The CDP **shall** set the General Status indicator to the states as mentioned below:  
•    PDU HEALTHY when PDU\_X\_PDU\_Health\_Status is set to PDU\_Healthy  
•    PDU DRIVING & HEALTHY when PDU\_X\_PDU\_Health\_Status is set to Overall\_Healthy  and PDU\_X\_PDU\_Roller\_Speed is non-zero.  
•    PDU OFF/NO DATA when PDU\_X\_INPUT\_Data\_Fault is True  
•    PDU ABNORMAL WHEN PDU\_X\_Faults\_Abnormal is set to True  
•    PDU DRIVING  & ABNORMAL WHEN PDU\_X\_Faults\_Abnormal is set to True and PDU\_X\_PDU\_Roller\_Speed is non-zero.  
•    PDU FAULTY when PDU\_X\_Faults\_Abnormal is False and (PDU\_X\_PDU\_Health\_Status is set to Not\_Healthy or PDU\_X\_PDU\_State set to PDU\_ST\_FAULTY)

Note: For PDU\_X\_Faults\_Abnormal, refer CDP-CIRD-85409

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-43581

The CDP **shall** set PDU type as follows:

* SELF LIFTING when PDU\_X\_PDU\_Type is set to Self\_Lifting
* SPRING LOADED when PDU\_X\_PDU\_Type is set to Spring\_Loaded

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

ID:CDP-CIRD-29214

The CDP s**hall** map the indicators mentioned in "PDU status Indicators" Column to the corresponding Signal mentioned in "Signal Name" Column and set it to the respective enumerated value as defined in the CAN ICD Rpt 11594.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **PDU Status Indicators** | **Signal Name** |
| Hold/ Release Status [Hold Status] | PDU\_X\_Hold\_Status |
| Lift Status [PDU Roller Position] | PDU\_X\_PDU\_Roller\_Position |
| PDU Health Status | PDU\_X\_PDU\_Health\_Status |
| PDU Cover Status | PDU\_X\_PDU\_Cover\_Status |
| PDU Mode | PDU\_X\_PDU\_Mode |
| PDU State | PDU\_X\_PDU\_State |
| Drive Motor Mode | PDU\_X\_Drive\_Motor\_Mode |
| Lift Motor Mode | PDU\_X\_Lift\_Motor\_Mode |
| Drive Motor State | PDU\_X\_Drive\_Motor\_State |
| Lift Motor Control Seq State | PDU\_X\_Lift\_Motor\_Control\_Seq\_State |
| Lift Motor State | PDU\_X\_Lift\_Motor\_State |
| Active Drive Command Direction | PDU\_X\_Active\_Drive\_Command\_Direction |

Table - PDU Status Indicators Signal Mapping

ID:CDP-CIRD-85122

The CDP **shall** map the PDU faults listed in "Faults" column to the Signals listed in "Fault Signal" Column and sets the Fault to True if the Fault Signal is received as 1 or to False otherwise.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **Faults** | **Fault Signal** |
| HVDC Over Voltage Fault | PDU\_X\_HVDC\_Over\_Voltage\_Fault |
| HVDC Under Voltage Fault | PDU\_X\_HVDC\_Under\_Voltage\_Fault |
| IGBT Protection Trip | PDU\_X\_IGBT\_Protection\_Trip |
| Board Over Temperature Fault | PDU\_X\_Board\_Over\_Temperature\_Fault |
| 115VAC Phase Fault | PDU\_X\_115VAC\_Phase\_Fault |
| Drive Motor Hall Sensor State Error | PDU\_X\_Drive\_Motor\_Hall\_Sensor\_State\_Error |
| Lift Motor Hall Sensor State Error | PDU\_X\_Lift\_Motor\_Hall\_Sensor\_State\_Error |
| Drive Motor State Machine Error | PDU\_X\_Drive\_Motor\_State\_Machine\_Error |
| Lift Motor State Machine Error | PDU\_X\_Lift\_Motor\_State\_Machine\_Error |
| Lift Mechanism Fault | PDU\_X\_Lift\_Mechanism\_Fault |
| CAN Address Pin Parity Fault | PDU\_X\_CAN\_Address\_Pin\_Parity\_Fault |
| Program Integrity Check Fault | PDU\_X\_Program\_Integrity\_Check\_Fault |
| RAM Fault | PDU\_X\_RAM\_Fault |
| NVM Fault | PDU\_X\_NVM\_Fault |
| HVDC Over Current Fault | PDU\_X\_HVDC\_Over\_Current\_Fault |
| ATRU Right Coil Over Temperature Fault | PDU\_X\_ATRU\_Right\_Coil\_Over\_Temperature\_Fault |
| ATRU Left Coil Over Temperature Fault | PDU\_X\_ATRU\_Left\_Coil\_Over\_Temperature\_Fault |
| Drive Motor Over Temperature Fault | PDU\_X\_Drive\_Motor\_Over\_Temperature\_Fault |
| IGBT Onchip Over Temperature Fault | PDU\_X\_IGBT\_Onchip\_Over\_Temperature\_Fault |
| DM Current Fault Monitoring Status | PDU\_X\_DM\_Current\_Fault\_Monitoring\_Status |
| LM Current Fault Monitoring Status | PDU\_X\_LM\_Current\_Fault\_Monitoring\_Status |

Table - PDU Faults to signal mapping

ID:CDP-CIRD-85176

The CDP **shall** map the PDU status signals mentioned in "PDU Status Signals" Column to the corresponding Signal mentioned in "Signal Name" Column and set it to the respective value as received on the CAN Bus.

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This is a derived requirement which maps the CDP display data with the CAN signal received.  
**Verification Method:** Test  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |
| --- | --- |
| **PDU Status Signals** | **Signal Name** |
| Current Mux | PDU\_X\_Current\_Mux |
| Voltage Mux | PDU\_X\_Voltage\_Mux |
| Temperature Mux | PDU\_X\_Temperature\_Mux |
| Measured Current | PDU\_X\_Measured\_Current |
| Measured Voltage | PDU\_X\_Measured\_Voltage |
| Measured Temperature | PDU\_X\_Measured\_Temperature |
| PDU Roller Speed | PDU\_X\_PDU\_Roller\_Speed |
| PDU LM Speed | PDU\_X\_PDU\_LM\_Speed |
| PDU LM Hall Count | PDU\_X\_PDU\_LM\_Hall\_Count |

Table - PDU Status Signals to signal Mapping

## Display Information Elements

This section details of display of information elements such as text colours, font size, font type, background colours, and foreground colours to be used for the texts in the CDP Pages

ID:CDP-CIRD-105492

The CDP **shall** follow the below table for representing the colours on CDP pages:

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement specifies the colours used in each of the CDP pages  
**Verification Method:** Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

| **COLOUR** | **RGB CODE** | **USAGE** | **PAGE APPLICABLE** |
| --- | --- | --- | --- |
| DARK BLUE SHADE-1 | R-10,G-62,B-84 | PAGE BACKGROUND | MAIN PAGE |
| CDP DETAIL SYSTEM STATUS |
| DARK BLUE SHADE-2 | R-0,G-81,B-132 | LEGEND ICON BACKGROUND | MAIN PAGE |
| CDP DETAIL SYSTEM STATUS |
| DARK BLUE SHADE-3 | R-7,G-62,B-82 | BACK BUTTON ICON BACKGROUND | MAIN PAGE |
| MAINTAINANCE PAGE |
| CONTINUOUS MONITORING PAGE |
| CDP DETAIL SYSTEM STATUS |
| DARK BLUE SHADE-4 | R-46,G-86,B-111 | ALL SECTION NAVIGATION  BACKGROUIND | CONTINUOUS MONITORING PAGE |
| DARK BLUE SHADE-5 | R-0,G-34,B-55 | CONTINUOUS MONITORING PAGE BACKGROUND | CONTINUOUS MONITORING PAGE |
| DARK BLUE SHADE-6 | R-0,G-82,B-129 | NAVIGATION TO MAINTAINANCE PAGE ICON | MAIN PAGE |
| NAVY BLUE | R-0,G-33,B-55 | FOREGROUND COLOUR FOR CARGO LAYOUT | MAIN PAGE |
| BRIGHT GREEN | R-86,G-183,B-0 | PDU, CP ICONS | MAIN PAGE |
| SECTION BOARDER | CONTINUOUS MONITORING PAGE - PDU |
| PDU,CP ICONS | CDP DETAIL SYSTEM STATUS |
| R-79,G-172,B-0 | NAVIGATION BUTTON PRESSED | MAINTAINANCE PAGE |
| ORANGE | R-255,G-145,B-0 | PDU, CP ICONS | MAIN PAGE |
| PDU | CDP DETAIL SYSTEM STATUS |
| RED | R-255,G-0,B-0 | PDU, CP ICONS | MAIN PAGE |
| PDU | CDP DETAIL SYSTEM STATUS |
| GREY SHADE-1 | R-152,G-150,B-149 | PDU, CP ICONS | MAIN PAGE |
| GREY SHADE-2 | R-83,G-83,B-83 | PDU,CP ICONS | CONTINUOUS MONITORING PAGE - PDU |
| GREY SHADE-3 | R-82,G-93,B-98 | ACCESS ZONE INDICATOR FOR MCP | MAIN PAGE |
| BOARDER LINE FOR ACCESS ZONE INDICATOR FOR MCP | MAIN PAGE |
| GREY SHADE-4 | R-57,G-104,B-129 | CONNECTOR LINE FOR ACCESS ZONE INDICATOR FOR MCP | MAIN PAGE |
| GREY SHADE-5 | R-83,G-93,B-98 | ACCESS ZONE INDICATOR FOR ICP | MAIN PAGE |
| BOARDER LINE FOR ACCESS ZONE INDICATOR FOR ICP | MAIN PAGE |
| GREY SHADE-6 | R-84,G-107,B-134 | CONNECTOR LINE FOR ACCESS ZONE INDICATOR FOR ICP | MAIN PAGE |
| GREY SHADE-7 | R-113,G-114,B-119 | ACCESS ZONE INDICATOR FOR OCP | MAIN PAGE |
| BOARDER LINE FOR ACCESS ZONE INDICATOR FOR OCP | MAIN PAGE |
| GREY SHADE-8 | R-108,G-115,B-122 | CONNECTOR LINE FOR ACCESS ZONE INDICATOR FOR OCP | MAIN PAGE |
| WHITE | R- 255,G-255,B-255 | PDU, CP ICONS ,TEXT COLOUR | MAIN PAGE |
|
| TEXT COLOUR | MAINTAINANCE PAGE |
| TEXT COLOUR | CDP DETAIL SYSTEM STATUS |
| BLACK | R-0,G-0,B-0 | TEXT COLOUR ON CP ICON | MAIN PAGE |
| BLUE SHADE-1 | R-99,G-141,B-164 | ACCESS ZONE INDICATOR FOR 1 LH, 2 LH | MAIN PAGE |
| BLUE SHADE-2 | R-88,G-124.B-144 | ACCESS ZONE INDICATOR FOR 3 LH, 4 LH | MAIN PAGE |
| BLUE SHADE-3 | R-94,G-121,G-139 | ACCESS ZONE INDICATOR FOR 1 RH, 2 RH | MAIN PAGE |
| BLUE SHADE-4 | R-99,G-141,B-164 | ACCESS ZONE INDICATOR FOR 3 RH, 4 RH | MAIN PAGE |
| BLUE SHADE-5 | R-34,G-61,B-86 | ACCESS ZONE BOARDER LINE 1 LH, 2 LH, 3 LH, 4 LH | MAIN PAGE |
| BLUE SHADE-6 | R-86,G-116,B-138 | ACCESS ZONE INDICATOR FOR  1 RH, 2 RH,     3 RH, 4 RH | MAIN PAGE |
| BLUE SHADE-7 | R-67,G-102,B-126 | THE CONNECTOR lINE FROM CONTROL PANEL TO THE ACCESS ZONE INDICATOR 1 LH, 2 LH, 3 LH, 4 LH | MAIN PAGE |
| BLUE SHADE-8 | R-143,G-174,B-191 | THE CONNECTOR lINE FROM CONTROL PANEL TO THE ACCESS ZONE INDICATOR 1 RH, 2 RH, 3 RH, 4 RH | MAIN APGE |
| BLUE SHADE-9 | R-69,G-92,B-107 | CARGO LAYOUT BOARDER | MAIN PAGE |

Table - CDP Page Display Information colours

ID:CDP-CIRD-105494

The CDP shall follow the below table for representing the Font Sizes on CDP pages:

**Applicability:** SW  
**Object Type:** Derived  
**Rational for Derived Req:**This requirement specifies the Font size and type used in the CDP pages  
**Verification Method:** Inspection  
**Safety Tag:** true  
**Safety Impact:** false  
**Safety Rationale:** This is Derived Requirement. Failure of this requirement is not safety critical and is as per the Design assurance Level D.

|  |  |  |
| --- | --- | --- |
| **MAIN PAGE** | | |
| **CONTENT** | **FONT TYPE** | **FONT SIZE** |
| CP Icon Text | Arial, Bold | 14 |
| PDU Numbers | Arial | 14 |
| **LEGEND PAGE [APPLICABLE TO BOTH MAIN PAGE AND DETAILED STATUS PAGE** | | |
| **CONTENT** | **FONT TYPE** | **FONT SIZE** |
| Legends Heading Row | Arial | 14 |
| Panel Status Text | Arial | 12 |
| CP Icon Text | Arial | 10 |
| PDU Status Text | Arial | 12 |
| **MAINTAINANCE PAGE** | | |
| **CONTENT** | **FONT TYPE** | **FONT SIZE** |
| Page Heading | Arial | 20 |
| Navigator Button Text | Arial | 12 |
| **CDP DETAIL SYSTEM STATUS** | | |
| **CONTENT** | **FONT TYPE** | **FONT SIZE** |
| Page Heading | Arial | 20 |
| CP Status Table Text | Arial, Bold | 9 |
| CP Icon Text | Arial, Bold | 10 |
| PDU Numbers | Arial | 10 |
| **CDP CONTINUOUS MONITORING PAGE** | | |
| **CONTENT** | **FONT TYPE** | **FONT SIZE** |
| Page Heading | Arial | 20 |
| Section Text | Arial | 14 |
| CP names, PDU numbers on top half of the page | Arial | 9 |
| CP names, PDU numbers on bottom half of the page [post section selection] | Arial | 11 |
| **CP, PDU STATUS PAGE** | | |
| Page Heading | Arial | 20 |
| Signal Status Text and Values | Arial | 9 |

Table - CDP PAGE FONT TYPE, SIZE

# TRACEABILITY REPORT

## CDP CIRD to SYSRD TRACE

| **CIRD Object ID** | **Object Type** | **In-links from SysRD** |
| --- | --- | --- |
| CDP-CIRD-41434 | Decomposed | SysRD-95193 |
| CDP-CIRD-41435 | Decomposed | SysRD-25692 |
| CDP-CIRD-41437 | Decomposed | SysRD-53465 |
| CDP-CIRD-41436 | Decomposed | SysRD-37790 |
| CDP-CIRD-52154 | Decomposed | SysRD-37790 |
| CDP-CIRD-52156 | Decomposed | SysRD-37790 |
| CDP-CIRD-51992 | Derived | NA |
| CDP-CIRD-29212 | Derived | NA |
| CDP-CIRD-29213 | Derived | NA |
| CDP-CIRD-47932 | Decomposed | SysRD-55077 |
| CDP-CIRD-26416 | Decomposed | SysRD-28647 |
| CDP-CIRD-26417 | Decomposed | SysRD-95222 |
| CDP-CIRD-52153 | Derived | NA |
| CDP-CIRD-52155 | Decomposed | SysRD-37790 |
| CDP-CIRD-52157 | Decomposed | SysRD-54607 |
| CDP-CIRD-26419 | Decomposed | SysRD-41990  SysRD-28642 |
| CDP-CIRD-26422 | Decomposed | SysRD-49006 |
| CDP-CIRD-26424 | Decomposed | SysRD-25691 |
| CDP-CIRD-26421 | Decomposed | SysRD-48937 |
| CDP-CIRD-96704 | Derived | NA |
| CDP-CIRD-85128 | Decomposed | SysRD-43431  SysRD-43430 |
| CDP-CIRD-41439 | Decomposed | SysRD-54588 |
| CDP-CIRD-41442 | Derived | NA |
| CDP-CIRD-43458 | Decomposed | SysRD-42148 |
| CDP-CIRD-50113 | Decomposed | SysRD-42148 |
| CDP-CIRD-50116 | Derived | NA |
| CDP-CIRD-105531 | Derived | NA |
| CDP-CIRD-105532 | Derived | NA |
| CDP-CIRD-105500 | Derived | NA |
| CDP-CIRD-52023 | Decomposed | SysRD-83930 |
| CDP-CIRD-51862 | Decomposed | SysRD-83932 |
| CDP-CIRD-105716 | Derived | NA |
| CDP-CIRD-105507 | Derived | NA |
| CDP-CIRD-105515 | Derived | NA |
| CDP-CIRD-105513 | Derived | NA |
| CDP-CIRD-105529 | Derived | NA |
| CDP-CIRD-105508 | Derived | NA |
| CDP-CIRD-105516 | Derived | NA |
| CDP-CIRD-105530 | Derived | NA |
| CDP-CIRD-47952 | Decomposed | SysRD-83925 |
| CDP-CIRD-52274 | Derived | NA |
| CDP-CIRD-25798 | Decomposed | SysRD-94338 |
| CDP-CIRD-44186 | Decomposed | SysRD-94338 |
| CDP-CIRD-47954 | Decomposed | SysRD-94338 |
| CDP-CIRD-52264 | Decomposed | SysRD-94338 |
| CDP-CIRD-52270 | Decomposed | SysRD-94338 |
| CDP-CIRD-52271 | Decomposed | SysRD-83927 |
| CDP-CIRD-105533 | Decomposed | SysRD-83927 |
| CDP-CIRD-105534 | Derived | NA |
| CDP-CIRD-47955 | Derived | NA |
| CDP-CIRD-47956 | Derived | NA |
| CDP-CIRD-47958 | Derived | NA |
| CDP-CIRD-52272 | Derived | NA |
| CDP-CIRD-52273 | Decomposed | SysRD-83929 |
| CDP-CIRD-85272 | Decomposed | SysRD-98551 |
| CDP-CIRD-105535 | Derived | NA |
| CDP-CIRD-105536 | Decomposed | SysRD-83929 |
| CDP-CIRD-105541 | Derived | NA |
| CDP-CIRD-105542 | Decomposed | SysRD-83926 |
| CDP-CIRD-105543 | Decomposed | SysRD-83926 |
| CDP-CIRD-105545 | Derived | NA |
| CDP-CIRD-105514 | Derived | NA |
| CDP-CIRD-105586 | Decomposed | SysRD-83928 |
| CDP-CIRD-105587 | Decomposed | SysRD-83928 |
| CDP-CIRD-105588 | Derived | NA |
| CDP-CIRD-105589 | Derived | NA |
| CDP-CIRD-105590 | Decomposed | SysRD-84393 |
| CDP-CIRD-105591 | Decomposed | SysRD-84393 |
| CDP-CIRD-105592 | Derived | NA |
| CDP-CIRD-105593 | Decomposed | SysRD-91904 |
| CDP-CIRD-105594 | Decomposed | SysRD-91904 |
| CDP-CIRD-105596 | Decomposed | SysRD-100200 |
| CDP-CIRD-105597 | Decomposed | SysRD-91507 |
| CDP-CIRD-105598 | Decomposed | SysRD-91507 |
| CDP-CIRD-105599 | Decomposed | SysRD-98564 |
| CDP-CIRD-105601 | Decomposed | SysRD-100198 |
| CDP-CIRD-105604 | Verbatim | SysRD-100200 |
| CDP-CIRD-105605 | Verbatim | SysRD-100201 |
| CDP-CIRD-105606 | Verbatim | SysRD-100203 |
| CDP-CIRD-105607 | Verbatim | SysRD-100204 |
| CDP-CIRD-105608 | Verbatim | SysRD-100206 |
| CDP-CIRD-105609 | Decomposed | SysRD-100207 |
| CDP-CIRD-52262 | Decomposed | SysRD-48936  SysRD-28880 |
| CDP-CIRD-105626 | Decomposed | SysRD-98134 |
| CDP-CIRD-105627 | Decomposed | SysRD-52238 |
| CDP-CIRD-41438 | Decomposed | SysRD-99717 |
| CDP-CIRD-47964 | Decomposed | SysRD-98180 |
| CDP-CIRD-105629 | Decomposed | SysRD-99713 |
| CDP-CIRD-105667 | Decomposed | SysRD-98132 |
| CDP-CIRD-105643 | Decomposed | SysRD-98132  SysRD-98178 |
| CDP-CIRD-105644 | Decomposed | SysRD-98175 |
| CDP-CIRD-105645 | Decomposed | SysRD-99768 |
| CDP-CIRD-105683 | Decomposed | SysRD-98181 |
| CDP-CIRD-105684 | Decomposed | SysRD-98182  SysRD-98184 |
| CDP-CIRD-105685 | Decomposed | SysRD-98185 |
| CDP-CIRD-105647 | Decomposed | SysRD-98187 |
| CDP-CIRD-105648 | Decomposed | SysRD-98186 |
| CDP-CIRD-105649 | Decomposed | SysRD-98691 |
| CDP-CIRD-105650 | Decomposed | SysRD-98188 |
| CDP-CIRD-105652 | Decomposed | SysRD-98191 |
| CDP-CIRD-105653 | Decomposed | SysRD-98627 |
| CDP-CIRD-105654 | Decomposed | SysRD-98192 |
| CDP-CIRD-105655 | Decomposed | SysRD-98193 |
| CDP-CIRD-51852 | Verbatim | SysRD-20837 |
| CDP-CIRD-51854 | Decomposed | SysRD-48981 |
| CDP-CIRD-85549 | Decomposed | SysRD-48878 |
| CDP-CIRD-51856 | Decomposed | SysRD-37790 |
| CDP-CIRD-84404 | Decomposed | SysRD-37790 |
| CDP-CIRD-52055 | Verbatim | SysRD-48929 |
| CDP-CIRD-52056 | Verbatim | SysRD-48930 |
| CDP-CIRD-52057 | Verbatim | SysRD-48805 |
| CDP-CIRD-51861 | Verbatim | SysRD-20860  SysRD-20862 |
| CDP-CIRD-52065 | Verbatim | SysRD-20847 |
| CDP-CIRD-51858 | Verbatim | SysRD-48977 |
| CDP-CIRD-90374 | Derived | NA |
| CDP-CIRD-105487 | Derived | NA |
| CDP-CIRD-105488 | Decomposed | SysRD-48763  SysRD-48764 |
| CDP-CIRD-105489 | Derived | NA |
| CDP-CIRD-47941 | Derived | NA |
| CDP-CIRD-47942 | Derived | NA |
| CDP-CIRD-47943 | Derived | NA |
| CDP-CIRD-47945 | Derived | NA |
| CDP-CIRD-47946 | Decomposed | SysRD-43525 |
| CDP-CIRD-47947 | Derived | NA |
| CDP-CIRD-47948 | Derived | NA |
| CDP-CIRD-47949 | Derived | NA |
| CDP-CIRD-47959 | Decomposed | SysRD-43525 |
| CDP-CIRD-47960 | Derived | NA |
| CDP-CIRD-96705 | Derived | NA |
| CDP-CIRD-47961 | Decomposed | SysRD-83929  SysRD-83928  SysRD-83926 |
| CDP-CIRD-47962 | Decomposed | SysRD-83926  SysRD-83928  SysRD-83929 |
| CDP-CIRD-47963 | Decomposed | SysRD-98132 |
| CDP-CIRD-41447 | Decomposed | SysRD-52241 |
| CDP-CIRD-41451 | Decomposed | SysRD-19147 |
| CDP-CIRD-26432 | Decomposed | SysRD-19147 |
| CDP-CIRD-29218 | Decomposed | SysRD-19147 |
| CDP-CIRD-42132 | Decomposed | SysRD-19147 |
| CDP-CIRD-26434 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26438 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26440 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26442 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26444 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26447 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26449 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26451 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26453 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26455 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26458 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26460 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26462 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26464 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-26466 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-84190 | Decomposed | SysRD-18173  SysRD-19147 |
| CDP-CIRD-90768 | Decomposed | SysRD-99818 |
| CDP-CIRD-105756 | Decomposed | SysRD-99717 |
| CDP-CIRD-105757 | Decomposed | SysRD-99717 |
| CDP-CIRD-105758 | Decomposed | SysRD-99717 |
| CDP-CIRD-41444 | Derived | NA |
| CDP-CIRD-42282 | Decomposed | SysRD-28685  SysRD-42165  SysRD-54573 |
| CDP-CIRD-42283 | Derived | NA |
| CDP-CIRD-84212 | Decomposed | SysRD-19147  SysRD-18173 |
| CDP-CIRD-90779 | Decomposed | SysRD-91507 |
| CDP-CIRD-105755 | Decomposed | SysRD-99717 |
| CDP-CIRD-83735 | Decomposed | SysRD-25874 |
| CDP-CIRD-83736 | Verbatim | SysRD-55075 |
| CDP-CIRD-26427 | Verbatim | SysRD-55078 |
| CDP-CIRD-26430 | Derived | NA |
| CDP-CIRD-43399 | Derived | NA |
| CDP-CIRD-82777 | Verbatim | SysRD-55082 |
| CDP-CIRD-82782 | Decomposed | SysRD-55086 |
| CDP-CIRD-26467 | Decomposed | SysRD-25887  SysRD-25876  SysRD-55087  SysRD-25895 |
| CDP-CIRD-26956 | Decomposed | SysRD-25874  SysRD-44180 |
| CDP-CIRD-83238 | Derived | NA |
| CDP-CIRD-83645 | Derived | NA |
| CDP-CIRD-28613 | Decomposed | SysRD-55116  SysRD-25894 |
| CDP-CIRD-85440 | Derived | NA |
| CDP-CIRD-29219 | Derived | NA |
| CDP-CIRD-29229 | Derived | NA |
| CDP-CIRD-29230 | Derived | NA |
| CDP-CIRD-28614 | Derived | NA |
| CDP-CIRD-85273 | Derived | NA |
| CDP-CIRD-41502 | Decomposed | SysRD-55090  SysRD-49014 |
| CDP-CIRD-41503 | Decomposed | SysRD-55099 |
| CDP-CIRD-85407 | Derived | NA |
| CDP-CIRD-41504 | Decomposed | SysRD-55106 |
| CDP-CIRD-85410 | Derived | NA |
| CDP-CIRD-85446 | Derived | NA |
| CDP-CIRD-41508 | Decomposed | SysRD-55102  SysRD-49014 |
| CDP-CIRD-41510 | Decomposed | SysRD-55086  SysRD-55102  SysRD-55090 |
| CDP-CIRD-83458 | Derived | NA |
| CDP-CIRD-42284 | Decomposed | SysRD-55121 |
| CDP-CIRD-28618 | Decomposed | SysRD-25874 |
| CDP-CIRD-28619 | Decomposed | SysRD-25874 |
| CDP-CIRD-42136 | Decomposed | SysRD-25874 |
| CDP-CIRD-42167 | Decomposed | SysRD-25887  SysRD-25876 |
| CDP-CIRD-28608 | Decomposed | SysRD-25887 |
| CDP-CIRD-42140 | Decomposed | SysRD-25874 |
| CDP-CIRD-42145 | Decomposed | SysRD-25874 |
| CDP-CIRD-26963 | Decomposed | SysRD-25887  SysRD-25891 |
| CDP-CIRD-42210 | Decomposed | SysRD-25887  SysRD-25892 |
| CDP-CIRD-26964 | Decomposed | SysRD-25888  SysRD-25887  SysRD-25889 |
| CDP-CIRD-26965 | Decomposed | SysRD-25890  SysRD-25887 |
| CDP-CIRD-28621 | Decomposed | SysRD-25874 |
| CDP-CIRD-28622 | Decomposed | SysRD-55124 |
| CDP-CIRD-28624 | Decomposed | SysRD-55135 |
| CDP-CIRD-28630 | Decomposed | SysRD-55138 |
| CDP-CIRD-28632 | Decomposed | SysRD-25874 |
| CDP-CIRD-28634 | Decomposed | SysRD-25880  SysRD-25875  SysRD-25881  SysRD-25883  SysRD-42163  SysRD-25879  SysRD-25876  SysRD-43417 |
| CDP-CIRD-28635 | Decomposed | SysRD-25883  SysRD-25881  SysRD-42163  SysRD-25880  SysRD-25879 |
| CDP-CIRD-28636 | Decomposed | SysRD-55138 |
| CDP-CIRD-28638 | Decomposed | SysRD-25874 |
| CDP-CIRD-28640 | Decomposed | SysRD-43417  SysRD-25888  SysRD-25887 |
| CDP-CIRD-84416 | Decomposed | SysRD-43417  SysRD-25887  SysRD-25889 |
| CDP-CIRD-43396 | Decomposed | SysRD-25890  SysRD-43417  SysRD-25887 |
| CDP-CIRD-43397 | Decomposed | SysRD-43417  SysRD-25887  SysRD-25891 |
| CDP-CIRD-43398 | Decomposed | SysRD-43417  SysRD-25887  SysRD-25892 |
| CDP-CIRD-28641 | Decomposed | SysRD-25890  SysRD-25891  SysRD-25892  SysRD-25888  SysRD-25889 |
| CDP-CIRD-84417 | Derived | NA |
| CDP-CIRD-41670 | Derived | NA |
| CDP-CIRD-41672 | Derived | NA |
| CDP-CIRD-41673 | Derived | NA |
| CDP-CIRD-41674 | Derived | NA |
| CDP-CIRD-41675 | Derived | NA |
| CDP-CIRD-41676 | Derived | NA |
| CDP-CIRD-41677 | Derived | NA |
| CDP-CIRD-41678 | Derived | NA |
| CDP-CIRD-41680 | Derived | NA |
| CDP-CIRD-41906 | Derived | NA |
| CDP-CIRD-41907 | Derived | NA |
| CDP-CIRD-41908 | Derived | NA |
| CDP-CIRD-41909 | Derived | NA |
| CDP-CIRD-41910 | Derived | NA |
| CDP-CIRD-41911 | Derived | NA |
| CDP-CIRD-41912 | Derived | NA |
| CDP-CIRD-41913 | Derived | NA |
| CDP-CIRD-41921 | Derived | NA |
| CDP-CIRD-41922 | Derived | NA |
| CDP-CIRD-41978 | Derived | NA |
| CDP-CIRD-41979 | Derived | NA |
| CDP-CIRD-41980 | Derived | NA |
| CDP-CIRD-41981 | Derived | NA |
| CDP-CIRD-41982 | Derived | NA |
| CDP-CIRD-41983 | Derived | NA |
| CDP-CIRD-41984 | Derived | NA |
| CDP-CIRD-41985 | Derived | NA |
| CDP-CIRD-41986 | Derived | NA |
| CDP-CIRD-41987 | Derived | NA |
| CDP-CIRD-41988 | Derived | NA |
| CDP-CIRD-41989 | Derived | NA |
| CDP-CIRD-41991 | Derived | NA |
| CDP-CIRD-41992 | Derived | NA |
| CDP-CIRD-41993 | Derived | NA |
| CDP-CIRD-41994 | Derived | NA |
| CDP-CIRD-41995 | Derived | NA |
| CDP-CIRD-41996 | Derived | NA |
| CDP-CIRD-41997 | Derived | NA |
| CDP-CIRD-41998 | Derived | NA |
| CDP-CIRD-41999 | Derived | NA |
| CDP-CIRD-42000 | Derived | NA |
| CDP-CIRD-42001 | Derived | NA |
| CDP-CIRD-42002 | Derived | NA |
| CDP-CIRD-42003 | Derived | NA |
| CDP-CIRD-84372 | Derived | NA |
| CDP-CIRD-84374 | Derived | NA |
| CDP-CIRD-84377 | Derived | NA |
| CDP-CIRD-84386 | Derived | NA |
| CDP-CIRD-42008 | Derived | NA |
| CDP-CIRD-42009 | Derived | NA |
| CDP-CIRD-42010 | Derived | NA |
| CDP-CIRD-42011 | Derived | NA |
| CDP-CIRD-42012 | Derived | NA |
| CDP-CIRD-42013 | Derived | NA |
| CDP-CIRD-42014 | Derived | NA |
| CDP-CIRD-42017 | Derived | NA |
| CDP-CIRD-42020 | Derived | NA |
| CDP-CIRD-42021 | Derived | NA |
| CDP-CIRD-42022 | Derived | NA |
| CDP-CIRD-42023 | Derived | NA |
| CDP-CIRD-42024 | Derived | NA |
| CDP-CIRD-42025 | Derived | NA |
| CDP-CIRD-84319 | Derived | NA |
| CDP-CIRD-84320 | Derived | NA |
| CDP-CIRD-84321 | Derived | NA |
| CDP-CIRD-84322 | Derived | NA |
| CDP-CIRD-42026 | Derived | NA |
| CDP-CIRD-42027 | Derived | NA |
| CDP-CIRD-42029 | Derived | NA |
| CDP-CIRD-42031 | Derived | NA |
| CDP-CIRD-42032 | Derived | NA |
| CDP-CIRD-42033 | Derived | NA |
| CDP-CIRD-42034 | Derived | NA |
| CDP-CIRD-42035 | Derived | NA |
| CDP-CIRD-42036 | Derived | NA |
| CDP-CIRD-42037 | Derived | NA |
| CDP-CIRD-42038 | Derived | NA |
| CDP-CIRD-42039 | Derived | NA |
| CDP-CIRD-42040 | Derived | NA |
| CDP-CIRD-42041 | Derived | NA |
| CDP-CIRD-84323 | Derived | NA |
| CDP-CIRD-84324 | Derived | NA |
| CDP-CIRD-84325 | Derived | NA |
| CDP-CIRD-84326 | Derived | NA |
| CDP-CIRD-42042 | Derived | NA |
| CDP-CIRD-42044 | Derived | NA |
| CDP-CIRD-42045 | Derived | NA |
| CDP-CIRD-42046 | Derived | NA |
| CDP-CIRD-42047 | Derived | NA |
| CDP-CIRD-42048 | Derived | NA |
| CDP-CIRD-42049 | Derived | NA |
| CDP-CIRD-42050 | Derived | NA |
| CDP-CIRD-42051 | Derived | NA |
| CDP-CIRD-84367 | Derived | NA |
| CDP-CIRD-84368 | Derived | NA |
| CDP-CIRD-84369 | Derived | NA |
| CDP-CIRD-84370 | Derived | NA |
| CDP-CIRD-84371 | Derived | NA |
| CDP-CIRD-85409 | Derived | NA |
| CDP-CIRD-42052 | Derived | NA |
| CDP-CIRD-43581 | Derived | NA |
| CDP-CIRD-29214 | Derived | NA |
| CDP-CIRD-85122 | Derived | NA |
| CDP-CIRD-85176 | Derived | NA |
| CDP-CIRD-105492 | Derived | NA |
| CDP-CIRD-105494 | Derived | NA |

Table - CDP CIRD TO SYSRD TRACE

## SYSRD TO CDP CIRD TRACE

| **SysRD Object ID** | **Out-links to CDP CIRD** |
| --- | --- |
| SysRD-19147 | CDP-CIRD-26449 CDP-CIRD-41451 CDP-CIRD-26464 CDP-CIRD-26460 CDP-CIRD-26458 CDP-CIRD-26455 CDP-CIRD-26466 CDP-CIRD-26462 CDP-CIRD-26451 CDP-CIRD-26453 CDP-CIRD-26442 CDP-CIRD-26447 CDP-CIRD-26438 CDP-CIRD-26444 CDP-CIRD-26434 CDP-CIRD-26432 CDP-CIRD-42132 CDP-CIRD-26440 CDP-CIRD-29218 CDP-CIRD-84190 CDP-CIRD-84212 |
| SysRD-25894 | CDP-CIRD-28613 |
| SysRD-98134 | CDP-CIRD-105626 |
| SysRD-25876 | CDP-CIRD-26467 CDP-CIRD-42167 CDP-CIRD-28634 |
| SysRD-100206 | CDP-CIRD-105608 |
| SysRD-20860 | CDP-CIRD-51861 |
| SysRD-28642 | CDP-CIRD-26419 |
| SysRD-83932 | CDP-CIRD-51862 |
| SysRD-48805 | CDP-CIRD-52057 |
| SysRD-43417 | CDP-CIRD-28640 CDP-CIRD-43396 CDP-CIRD-43398 CDP-CIRD-43397 CDP-CIRD-84416 CDP-CIRD-28634 |
| SysRD-48930 | CDP-CIRD-52056 |
| SysRD-48936 | CDP-CIRD-52262 |
| SysRD-49006 | CDP-CIRD-26422 |
| SysRD-44180 | CDP-CIRD-26956 |
| SysRD-25883 | CDP-CIRD-28635 CDP-CIRD-28634 |
| SysRD-18173 | CDP-CIRD-84190 CDP-CIRD-26462 CDP-CIRD-26434 CDP-CIRD-26466 CDP-CIRD-26464 CDP-CIRD-26458 CDP-CIRD-26455 CDP-CIRD-26453 CDP-CIRD-26460 CDP-CIRD-26440 CDP-CIRD-26451 CDP-CIRD-26449 CDP-CIRD-26447 CDP-CIRD-26442 CDP-CIRD-26438 CDP-CIRD-26444 CDP-CIRD-84212 |
| SysRD-42165 | CDP-CIRD-42282 |
| SysRD-48929 | CDP-CIRD-52055 |
| SysRD-20837 | CDP-CIRD-51852 |
| SysRD-25879 | CDP-CIRD-28634 CDP-CIRD-28635 |
| SysRD-95222 | CDP-CIRD-26417 |
| SysRD-48878 | CDP-CIRD-85549 |
| SysRD-48977 | CDP-CIRD-51858 |
| SysRD-48937 | CDP-CIRD-26421 |
| SysRD-28880 | CDP-CIRD-52262 |
| SysRD-98186 | CDP-CIRD-105648 |
| SysRD-25881 | CDP-CIRD-28635 CDP-CIRD-28634 |
| SysRD-52241 | CDP-CIRD-41447 |
| SysRD-83930 | CDP-CIRD-52023 |
| SysRD-25875 | CDP-CIRD-28634 |
| SysRD-25890 | CDP-CIRD-26965 CDP-CIRD-43396 CDP-CIRD-28641 |
| SysRD-98564 | CDP-CIRD-105599 |
| SysRD-25692 | CDP-CIRD-41435 |
| SysRD-95193 | CDP-CIRD-41434 |
| SysRD-25891 | CDP-CIRD-28641 CDP-CIRD-26963 CDP-CIRD-43397 |
| SysRD-98627 | CDP-CIRD-105653 |
| SysRD-83925 | CDP-CIRD-47952 |
| SysRD-98181 | CDP-CIRD-105683 |
| SysRD-53465 | CDP-CIRD-41437 |
| SysRD-25889 | CDP-CIRD-26964 CDP-CIRD-28641 CDP-CIRD-84416 |
| SysRD-25895 | CDP-CIRD-26467 |
| SysRD-98691 | CDP-CIRD-105649 |
| SysRD-98188 | CDP-CIRD-105650 |
| SysRD-98193 | CDP-CIRD-105655 |
| SysRD-98192 | CDP-CIRD-105654 |
| SysRD-99768 | CDP-CIRD-105645 |
| SysRD-100203 | CDP-CIRD-105606 |
| SysRD-54573 | CDP-CIRD-42282 |
| SysRD-100200 | CDP-CIRD-105604 CDP-CIRD-105596 |
| SysRD-42163 | CDP-CIRD-28635 CDP-CIRD-28634 |
| SysRD-84393 | CDP-CIRD-105590 CDP-CIRD-105591 |
| SysRD-91904 | CDP-CIRD-105594 CDP-CIRD-105593 |
| SysRD-83928 | CDP-CIRD-105587 CDP-CIRD-105586 CDP-CIRD-47961 CDP-CIRD-47962 |
| SysRD-25691 | CDP-CIRD-26424 |
| SysRD-52238 | CDP-CIRD-105627 |
| SysRD-98175 | CDP-CIRD-105644 |
| SysRD-83926 | CDP-CIRD-105543 CDP-CIRD-47961 CDP-CIRD-105542 CDP-CIRD-47962 |
| SysRD-98180 | CDP-CIRD-47964 |
| SysRD-83927 | CDP-CIRD-52271 CDP-CIRD-105533 |
| SysRD-98132 | CDP-CIRD-105667  CDP-CIRD-105643 CDP-CIRD-47963 |
| SysRD-94338 | CDP-CIRD-44186 CDP-CIRD-52264 CDP-CIRD-25798 CDP-CIRD-52270 CDP-CIRD-47954 |
| SysRD-98551 | CDP-CIRD-85272 |
| SysRD-98182 | CDP-CIRD-105684 |
| SysRD-25892 | CDP-CIRD-28641 CDP-CIRD-42210 CDP-CIRD-43398 |
| SysRD-83929 | CDP-CIRD-52273 CDP-CIRD-105536 CDP-CIRD-47961 CDP-CIRD-47962 |
| SysRD-100204 | CDP-CIRD-105607 |
| SysRD-100201 | CDP-CIRD-105605 |
| SysRD-28647 | CDP-CIRD-26416 |
| SysRD-98184 | CDP-CIRD-105684 |
| SysRD-98178 | CDP-CIRD-105643 |
| SysRD-55075 | CDP-CIRD-83736 |
| SysRD-42148 | CDP-CIRD-43458 CDP-CIRD-50113 |
| SysRD-54607 | CDP-CIRD-52157 |
| SysRD-20847 | CDP-CIRD-52065 |
| SysRD-99713 | CDP-CIRD-105629 |
| SysRD-43430 | CDP-CIRD-85128 |
| SysRD-98187 | CDP-CIRD-105647 |
| SysRD-98185 | CDP-CIRD-105685 |
| SysRD-25880 | CDP-CIRD-28635 CDP-CIRD-28634 |
| SysRD-98191 | CDP-CIRD-105652 |
| SysRD-100198 | CDP-CIRD-105601 |
| SysRD-41990 | CDP-CIRD-26419 |
| SysRD-100207 | CDP-CIRD-105609 |
| SysRD-25887 | CDP-CIRD-26467 CDP-CIRD-42167 CDP-CIRD-42210 CDP-CIRD-43398 CDP-CIRD-26963 CDP-CIRD-43396 CDP-CIRD-43397 CDP-CIRD-28640 CDP-CIRD-26965 CDP-CIRD-26964 CDP-CIRD-84416 CDP-CIRD-28608 |
| SysRD-43525 | CDP-CIRD-47959 CDP-CIRD-4794 |
| SysRD-43431 | CDP-CIRD-85128 |
| SysRD-55086 | CDP-CIRD-82782 CDP-CIRD-41510 |
| SysRD-55099 | CDP-CIRD-41503 |
| SysRD-49014 | CDP-CIRD-41508 CDP-CIRD-41502 |
| SysRD-55102 | CDP-CIRD-41508 CDP-CIRD-41510 |
| SysRD-25874 | CDP-CIRD-42136 CDP-CIRD-42140 CDP-CIRD-42145 CDP-CIRD-26956 CDP-CIRD-28638 CDP-CIRD-28618 CDP-CIRD-28619 CDP-CIRD-28632 CDP-CIRD-28621 CDP-CIRD-83735 |
| SysRD-25888 | CDP-CIRD-28641 CDP-CIRD-28640 CDP-CIRD-26964 |
| SysRD-55121 | CDP-CIRD-42284 |
| SysRD-55082 | CDP-CIRD-82777 |
| SysRD-55077 | CDP-CIRD-47932 |
| SysRD-55106 | CDP-CIRD-41504 |
| SysRD-55138 | CDP-CIRD-28630 CDP-CIRD-28636 |
| SysRD-55078 | CDP-CIRD-26427 |
| SysRD-55087 | CDP-CIRD-26467 |
| SysRD-55090 | CDP-CIRD-41510 CDP-CIRD-41502 |
| SysRD-55135 | CDP-CIRD-28624 |
| SysRD-55116 | CDP-CIRD-28613 |
| SysRD-55124 | CDP-CIRD-28622 |
| SysRD-48764 | CDP-CIRD-105488 |
| SysRD-48763 | CDP-CIRD-105488 |
| SysRD-48981 | CDP-CIRD-51854 |
| SysRD-91507 | CDP-CIRD-105598 CDP-CIRD-105597 CDP-CIRD-90779 |
| SysRD-28685 | CDP-CIRD-42282 |
| SysRD-99818 | CDP-CIRD-90768 |
| SysRD-20862 | CDP-CIRD-51861 |
| SysRD-37790 | CDP-CIRD-51856 CDP-CIRD-52156 CDP-CIRD-84404 CDP-CIRD-52155 CDP-CIRD-52154 CDP-CIRD-41436 |

Table - SysRD to CIRD Trace