



RCMP-1080-01-xx
SHEET 1 of 9
DDP
Issue No.. B
MoD ref.. -

DECLARATION OF DESIGN AND PERFORMANCE

RCMP-1080-01-yy-DDP

Remote Control - Monitor Panel



Name and Address of Manufacturer:	Real-Time Vision Ltd. 21 Hornsby Square, Southfields Industrial Estate Laindon, Essex. SS15 6SD United Kingdom www.Real-Time-Vision.com
Description:	Remote Control – Monitor Panel Designed for direct mounting in rugged, high quality airborne display applications. Compatible with the AVDU series Monitors
Identification (Drawing/Part Number):	RCMP-1080-01 yy Horizontal mounting (yy=01 to 49) RCMP-1080-01 yy Vertical mounting (yy=51-99)
Modification Standard (Issue)	Mod Strike 0
GA, Drawing or MRI Reference:	RCMP-1080-01-GA
Other Relevant Drawings:	See Table below
Weight and Overall	Mass: <1kg
Dimensions: Dzus mounting	Height: 183mm Width: 35mm Depth: 63mm behind panel (not including connector),
Electrical Power Requirements:	Derived from host display unit
Details of Associated Approvals:	As listed herein
Applicable Manuals (Service, Overhaul, Wiring etc.):	See table below
Qualification Test Reports:	D0160D Test Report No. N/A See table below
Stress Report	SR No. N/A (Enclosed box, non hazard)



RCMP-1080-01-xx
SHEET 2 of 9
DDP
Issue No.. B
MoD ref.. -

DECLARATION OF DESIGN AND PERFORMANCE

Environmental Conditions	Altitude	To 25,000ft
	Temperature	Stand-by -30°C to +70°C Operating -25°C to +55°C Storage -30°C to +80°C
	Humidity	@ +20°C to 80% Non Condensing
	Waterproofed	No - To be cabin mounted.
Other Relevant Reports	N/A	
Limitations:.	As listed herein	
Departures from Specification	<i>The equipment meets the requirements for use in a No Hazard installation, except where stated</i>	

I hereby certify that the above information is accurate. Real-Time Vision cannot accept responsibility for the satisfactory operation of equipment used outside the conditions given above.

Signed: AJM Suggs

Whilst care has been taken to provide as much detail as possible for use of this product it cannot be relied upon as an exhaustive source of information. This product is for use by suitably qualified persons who understand the nature of the work they are doing and are able to take suitable precautions and design and produce a system integration that is safe and meets regulatory requirements.



RCMP-1080-01-xx
SHEET 3 of 9
DDP
Issue No.. B
MoD ref.. -

DECLARATION OF DESIGN AND PERFORMANCE

APPLICABLE DOCUMENTS

REFERENCE	TITLE	REV	DATE
RCMP-1080-01-yyICD	Interface control Drawing	B	
RCMP-1080-01-yy-GA	GA, Drawing or MRI Reference:	A	
RCMP-1080-01-yy-ATP	Acceptance Test Procedure	A	
RCMP-1080-01-yy-OPS	Operator Manual	A	
RCMP-1080-01-DDP	Declaration of design and performance	-	- see cover
RTCA DO-160D	Environmental Conditions and Test Procedures for Airborne Equipment	D + Ch 1 Ch 2 Ch 3	Jul 1997 Dec 2000 Jun 2001 Dec 2002
MIL-STD-704E	Transients	E	
MIL-STD-461E	EMI: conducted emission/ conducted susceptibility	E	
MIL-STD-3009	NVG interface and performance requirements (derived from MIL-L-85762A)		February 2001



RCMP-1080-01-xx
SHEET 4 of 9
DDP
Issue No.. B
MoD ref.. -

DECLARATION OF DESIGN AND PERFORMANCE

EUROCAE/ED-14D /RTCA DO-160D compliance statement

DO-160D, Environmental Conditions and Test Procedures for Airborne Equipment Issued July-29-1997 Superseded DO-160C, Changes 1, 2 & 3 Prepared by SC-135 Standard procedures and environmental test criteria for testing airborne equipment for the entire spectrum of aircraft from light general aviation aircraft and helicopters through the “Jumbo Jets” and SST categories of aircraft. The document includes 25 Sections and three Appendices. Examples of tests covered include vibration, power input, radio frequency susceptibility, lightning, and electrostatic discharge. Coordinated with EUROCAE, RTCA/DO-160D and EUROCAE/ED-14D are identically worded.

DO-160D is recognized by the International Organization for Standardization (ISO) as de facto international standard ISO-7137.

This unit has been designed to meet the environmental conditions specified in RTCA/DO-160D, dated as indicated below.

Section	Compliance
4 - Temperature & Altitude	Category A1 This unit is considered satisfactory for operation up to an altitude of 25,000 feet un-pressurised.
5 - Temperature Variation	Category C Within the range 0°C-50°C
6 - Humidity	Category A
7 - Operational Shocks & Crash Safety	Category B Operation 6g 11/ms Non operation 15g/11ms
8 - Vibration	Category R+U (equiv: DO-160C Helicopter -Test curve 'N', 1.5g p-p)
9 - Explosion Proofing	N/A Category A Equipment located within the passenger cabin.
10 - Waterproofing	Category W
11 - Fluid susceptibility	Category X
12 - Sand & Dust	Category D
13 - Fungus Resistance	N/A Category F
14 - Salt Spray	N/A Category X
Sections described below, which address the EMC requirements for aircraft, are called up in the Advisory Circular Joint (AC)/ Advisory Material Joint (AMJ) 20.1317 and the User Guide. They describe detailed test EMC requirements and test methods for each of the phenomena listed:	
15 - Magnetic Effect	Category A The unit has no perceivable effect when mounted within 460mm (18”) of an aircraft magnetic compass
16 - Power Input	Category B
17 - Voltage Spike	Category A
18 - Audio Frequency	Categories A + Z
19 - Induced Susceptibility	Category Z
20 - RF Susceptibility (Radiated & Conducted)	Category U
21 - RF Emission	Category B
22 - Lightning Induced Transients	Not considered
23 - Lightning Direct Effects	Not considered
25 – Electrostatic discharge	
24 - Icing	Category X



RCMP-1080-01-xx
SHEET 5 of 9
DDP
Issue No.. B
MoD ref.. -

DECLARATION OF DESIGN AND PERFORMANCE

DESIGN STATEMENT

The remote control panel described herein has been designed using techniques, common parts and practices gained from the design and testing to RTCA DO-160 of monitors in the AVDU series. The principle areas of similarity are:

Housing construction

The housing is constructed from machined aluminium.

Component retention

All major components and assemblies are secured to the chassis using a combination of metal and insulating nylon screws.

Components that may become loosened by vibration, such as plug in components and links, are secured using non-conductive silicon sealant or epoxy.

Screws secure the two halves of the case.

General Description

This specification applies to the remote control panel and its variants.

The remote control supports the AVDU series monitors through a universal proprietary low voltage differential serial control bus optimised for reliable operation in airborne surveillance applications.

The unit has a panel of eight function keys and a five button menu and direction key pad together with a rotary control. All buttons are back illuminated with NVG compatible lighting.

This remote Control contains:

- Control unit Panel Electronic Circuit (PEC)
- Inverter for the front panel controls backlight
- Buttons, backlights and rotary control



RCMP-1080-01-xx
SHEET 6 of 9
DDP
Issue No.. B
MoD ref.. -

DECLARATION OF DESIGN AND PERFORMANCE

Miscellaneous	
Safety	The design of the remote control unit is such that any failure will not result in a hazardous condition and provides fail-safe features for safety of personnel during the installation, operation, maintenance and repair
Input protection	Short circuit to Chassis of any input will not damage the equipment nor cause an unsafe condition.
Output protection	Short circuit to earth of any output will not damage the equipment nor cause an unsafe condition.
Bonding	All metallic parts are bonded with a max resistance between any two parts of 0.5Ω.
Earthing	The equipment is earthed internally to a chassis bonding tag connected to Pin C of the power connector. All D.C. neutral or negative connections as well as signal returns are brought-out via the external connectors and separated from each other. (exception made for R.F. circuitry)
Insulation Resistance	Insulation between any two points of this equipment not electrically connected to each other is at least 20M ohms. This measurement is made on a complete item of equipment.
Cooling	Cooling of the equipment is by natural convection. The installer must ensure that the case temperatures are not exceeded.

DESIGN AND PRODUCTION	
Components, materials and processes	Standard parts are used wherever possible. As a general rule, the use of non-approved components is avoided. Where this is not possible, components are selected to meet the conditions of the particular specification of the equipment.
Metallic materials	Metallic materials used for manufacturing the equipment are consistent with the grades selected by the national and international aviation standards. The materials used are adequately protected against corrosion of any origin by using only qualified methods that are sufficiently efficient considering the environmental conditions to be found on the aircraft.
Flammable materials	Materials employed in the equipment design and manufacturing do not promote combustion. In event of fire the metallic and glass construction of the case does not sustain nor support combustion and no hazardous quantities of toxic or noxious (e.g. smoke) products will be distributed in the crew / cargo compartments.
Finishing	Equipment external surfaces are finished Matt Black
Interchangeability	All parts built with the same part number (P/N) or drawing number are functionally and dimensionally interchangeable with each other.
Identification and marking	Information on the equipment identification label is as follows: <ul style="list-style-type: none"> • Manufacturer's name • Item description • Part Number • Serial Number • Date of Manufacture • Identification Firmware revisions (where applicable)

DECLARATION OF DESIGN AND PERFORMANCE

Functions

- The brightness of the connected display is adjusted using the rotary brightness control
- The set-up and configuration menu of the connected display is accessed by pressing the centre button of the direction keys – this will display the menu On Screen Display (OSD) on the connected display. Navigation around the OSD is achieved using the four direction keys and the centre menu button.
- The eight function keys are configured as part of the manufacturing process and may be assigned to any monitor/display function. Some of the function keys may operate in conjunction with the four direction keys. The configuration of these keys is specified by the part number of the unit where the “yy” digits determine the orientation and function of the buttons.



<p>Typical available Control Functions Functions are dependant on the factory configuration of the unit designated by the “yy” digits in the part number. (See ICD for definition)</p>	<p>The eight function buttons may be programmed at manufacture to perform the following functions:</p> <p>Power On/Off (Standby power)</p> <p>Video Brightness</p> <p>Video Contrast</p> <p>Video Colour Saturation</p> <p>Graphic input selection (External XGA input to monitor)</p> <p>Video inputs 1-6 selection (Composite, Y/C or component inputs)</p> <p>Picture in Picture mode (Video input inserted over a Graphic background) (Direction keys move the centre of the PIP box around the screen) (Where there is no separate PIP button, PIP may be invoked by pressing the Graphic button a second time)</p> <p>Freeze</p> <p>Image Zoom (Direction keys move the centre of the zoom) (Where there is no separate Zoom button, zoom may be invoked by pressing the freeze button a second time (i.e. zoom into a frozen image)</p> <p>Monitor/Display Lightbox Brightness (Rotary control)</p> <p>Switch Backlight brightness (Slaved to monitor brightness or external)</p> <p>Monitor Power supply inhibit (Total shutdown of power)</p> <p>OSD Menu Select (Centre button)</p> <p>OSD Select up (Up key)</p> <p>OSD Select down (Down Key)</p> <p>Setting + (Right) (Right key)</p> <p>Setting – (Left) (Left Key)</p>
<p>Control interface</p>	<p>Backlit Buttons/rotary controls Proprietary bus serial control</p>
<p>Settings memory</p>	<p>Settings are stored in non volatile memory within the display and the remote unit</p>



RCMP-1080-01-xx
SHEET 8 of 9
DDP
Issue No.. B
MoD ref.. -

DECLARATION OF DESIGN AND PERFORMANCE

Electrical

Electrical characteristics

Power supply

- Input current up to 5 Amps (Limited by current in connector pin)

Specifications

(typical at TBP = 25°C, nominal)

Parameter	Min	Typ	Max	Remarks
Input voltage				12VDC or, 28VDC
Maximum current			0.5A	

Maintenance

There are no user serviceable parts inside the unit.
1st Line maintenance - Cleaning of Front switches

Handling Precautions

Handling of the unit should be in compliance with Real-Time Vision's handling principles.

- 1) Be sure to turn off power supply when inserting or disconnecting the input connectors.
- 2) Wipe off water or fluid droplets immediately. Long contact with water or other fluids may cause discoloration or spots.
- 3) When the front switch surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 4) Since CMOS LSI is used in this module, take adequate static electricity precautions and ensure correct human earth bonding when handling.
- 5) Do not open nor modify the Assembly.
- 6) At the insertion or removal of the Power and Signal Interface Connector, ensure that the sockets are free from debris and be sure not to damage the Interface pins



RCMP-1080-01-xx
SHEET 9 of 9
DDP
Issue No.. B
MoD ref.. -

DECLARATION OF DESIGN AND PERFORMANCE

Safety

Sharp Edge Requirements

There are no sharp edges or comers on the display assembly that could cause injury.

Materials

Toxicity

There are no carcinogenic materials used anywhere in the display module. Where toxic materials are used, they will be reviewed and approved by the responsible ADT Toxicologist.

Flammability

All components including electrical components that do not meet the flammability grade UL94-V1 in the module will complete the flammability rating exception approval process. The PECs (Panel Electronic Circuit) boards will be made from material rated 94-V1 or better. The actual UL flammability rating will be printed on the printed circuit board where appropriate.

Capacitors

Where polarized capacitors are used in the display assembly, provisions will be made to keep them from being inserted backwards.

Hazardous Voltages

Any point exceeding 42.4 volts meets the requirement of the limited current circuit. The current through a 2K Ω resistance is less than $0.7 \times f$ (kHz) mA.

LIMITATION OF LIABILITY

The manufacturer's liability for damages to customer or others resulting from the use of any product supplied hereunder shall in no event exceed the purchase price of said product.

IMPORTANT USAGE NOTE

This equipment is for use by developers and integrators, the manufacturer accepts no liability for damage or injury caused by the use of this product. It is the responsibility of the developer, integrators or other user of this product to:

- Ensure that all necessary and appropriate safety measures are taken.
- Obtain suitable regulatory approvals as may be required.
- Check power settings to all component parts before connection.

Disclaimer

Real-Time Vision reserves the right to make changes to this document and the product which it describes without notice. In addition, Real-Time vision. shall not be liable for technical or editorial errors or omissions made herein; nor for incidental or consequential damages resulting from the furnishing, performance, and use of this product.

This product shall not be used for or in connection with equipment that requires an extremely high level of reliability, such as life critical systems, nuclear power control equipment and medical or other life support equipment. Real-Time Vision. takes no responsibility for damage caused by improper use of this product which does not meet the conditions for use specified in this specification sheet.