



DNVS DISPLAY UNITS DRIVER'S NIGHT VISION AND LOCAL SITUATIONAL AWARENESS DISPLAY SCREEN UNITS

Selex ES offers a range of display screen options for the driver's night vision and local situational awareness systems. The display screens are available in a range of sizes, and can be tailored to provide varying levels of capability and complexity. All of the display screen options are specifically designed to match the Selex ES range of cameras, and have a very high level of integrated capability fully contained within the display units, reducing the need for any additional LRUs.

KEY FEATURES

- Comprehensive integral graphics provides soft-key menus (text or graphics), and other information presentation including overlays on video sources (e.g. vehicle edge markers)
- Versatile video tiling capability allows customer defined placement of multiple camera views on a single user screen (10.4" and 15" Displays)
- Innovative integral video distribution enables independent user selection of imagery views on multiple displays within the vehicle
- Integral serial interfaces facilitate control and monitoring of cameras
- Integral power supply provides switchable power for cameras and display
- Designed to interface and operate multiple cameras per display unit
- Unique design concept allows systems to be provided with a low LRU count
- Membrane Bezel keys provide positive feedback on keypresses for robust operation whilst static and on-the-move
- Adjustable bezel key and screen backlight brightness
- Night Vision Goggle compatible
- Integral serial, CAN and Ethernet interfaces facilitate control and monitoring of other equipment fitted to the vehicle
- More than 2000 displays in service
- Integral BITE for alerting and fault finding.

8.4" DRIVER'S DISPLAY UNIT (DDU)

The 8.4" Driver's Display Unit (DDU) is designed for applications where a smaller size screen is necessary, providing an optimum balance between capability, size and eye relief, for vehicles with a more restricted internal space. The DDU interfaces with multiple cameras, additional video sources, and a VGA video source. The user can select to display any of the available video sources (e.g. front camera, rear camera, and an external Battlefield Management System).

As well as powering and controlling the multiple attached cameras, graphics can be generated and overlaid on the video images. This allows vehicle edge marker graphics overlays to be presented, as well as other functions to meet users needs, such as navigation information from a GPS (e.g. position, bearing, and next waypoint indicators).

For those circumstances where space constraints inhibit the use of a conventional display, such as the DDU, Selex ES has an alternative display option called EziView which enables realtime images from thermal or daylight sensors to be overlaid on the periscopic vision block of an armoured fighting vehicle, while giving the user their normal view at the flick of a switch.

For further information please refer to the EziView datasheet.

Technical Specification

Nominal screen size	8.4" (213mm) diagonal 170mm (H) x 128mm (V)
Screen pixel resolution	800 Horizontal x 600 Vertical
Screen colours	262,144 (3 x 6 bit)
Screen viewing angles	Up to $\pm 60^\circ$ Horizontal and Vertical
Screen peak light output	200 Cd/m ² (at 25 °C)
Screen contrast ratio	500:1
Switches	12 pushbutton switches including a shrouded Master On/Off switch
Switch illumination	Green (with user adjustment between zero and full brightness)
Dimensions (excl.connectors)	161mm (H) x 250mm (W) x 66mm (D)
Operating temperature	-25 °C to +60 °C
Weight	3.5Kg
Options	Side or Rear Connectors



8.4" DDU fitted at vehicle driver's position

10.4" MULTIFUNCTION DISPLAY UNIT (MDU)

The Multifunction Display Unit (MDU) is a high performance multi function display. It provides the video presentation, Human Machine Interface (HMI), central power distribution and host communication functions for the SA System.

The MDU is a 10.4 inch colour LCD flat panel display with illuminated controls and indicators arranged around the screen. The controls utilise soft keys to allow easy adaptation to suit a multitude of different sensor interfaces.

The MDU provides video imagery from up to sixteen analogue video sources that may be colour or monochrome and 525/60 Hz or 625/50 Hz format. It is able to display the videos in a 'picture and picture' format, allowing the user to view a Thumbnail view from all the sensors fitted to the vehicle, or as a full screen image from the sensor selected. All the video inputs are buffered and provided as outputs for distribution among other displays and/or video recorders. Each MDU directly provides power and control for up to six DNVS 4 or Situational Awareness Cameras.

In addition to the analogue videos, the MDU provides a computer interface to allow input of VGA/SVGA/XVGA data from a Vehicle System or a Battlefield Management System including Moving Map imagery.

A full screen image of any individual video source can be selected, or a number of video images can be tiled onto the screen using the "picture in picture" capability. Factory configuration allows a number of pre-defined tiling patterns to be set up, with each video image being fully versatile in terms of position and size, rather than a fixed matrix (e.g. 2x2). A set of typical screen layouts for tiled images is shown. The MDU includes a graphics overlay capability for the display of both text and other graphics elements, including the soft-key menu overlays. There is a multiple colour palette available for the graphics to ensure clear visibility under all video conditions.

These displays are typically used in multiple positions within the vehicle, for the commander, dismount crew, and/or specialist equipment operators. The MDU can also be used instead of the smaller Drivers Display Unit for the vehicle driver where space permits. The display provides a special buffered video bus for linking together multiple displays, allowing each user to independently select their video sources and tiled views without affecting other users.

Communications between the MDU and other system elements is via multiple industry standard serial data-buses, which include RS422, RS485, RS232, Canbus and Ethernet. This allows data to be sent or received from other types of equipment fitted to the vehicle, such as GPS devices, acoustic sniper detection systems, remote weapon stations, mast mounted cameras, etc.



Typical 10.4" MDU installation for vehicle commander

Technical Specification

Nominal screen size	10.4" (264mm) diagonal: 212mm (H) x 158mm (V)
Screen pixel resolution	1024 Horizontal x 768 Vertical
Screen colours	262,144 (3 x 6 bit)
Screen viewing angles	Up to $\pm 60^\circ$ Horizontal and Vertical
Screen peak light output	200 Cd/m ² (at 25 °C)
Screen contrast ratio	500 : 1
Switches	25 pushbutton switches including a Master On/Off switch
Switch illumination	Green (with user adjustment between zero and full brightness)
Dimensions (excl.connectors)	241mm (H) x 306mm (W) x 70mm (D)
Operating temperature	-25 °C to +60 °C
Weight	6.5Kg
Display options	Integral Windows CE Processor Board
Options	Side or Rear Connectors



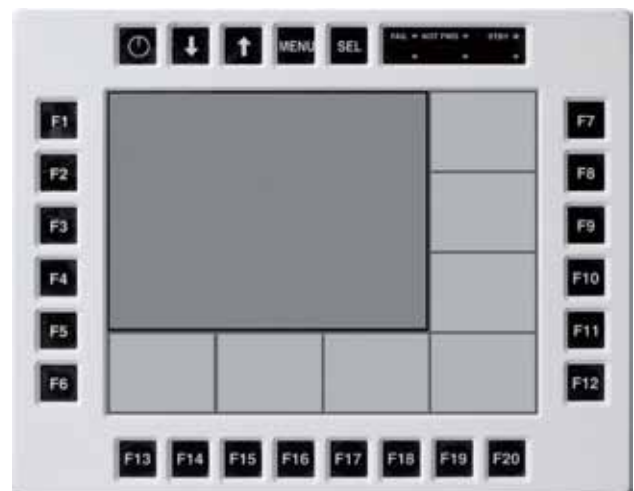
10.4" MDU in Fleet Management System (FMS) Mode



10.4" MDU in Forward/Rear PiP Mode



10.4" MDU in All Camera Tiled PiP Mode



10.4" MDU in Thumbnail PiP Mode

10.4" INTELLIGENT MULTIFUNCTION DISPLAY UNIT (IMDU)

The 10.4" intelligent Multifunction Display Unit (iMDU) is similar to the standard MDU screen in terms of functionality, size and weight, but has an additional integral processor module (including ultra low power integrated graphics) which is capable of running other PC based applications, either Selex ES or customer supplied, with the soft-keys interfacing with the application. This is in addition to all of the functions of the 10.4" MDU.

Typical applications might be the Selex ES VANTAGE Mobile Moving Map, a vehicle Health and Usage Monitoring System, or vehicle maintenance applications.

The screen display can switch between the standard situational awareness view, and any application running on the processor module. The standard processor option is an Intel® Atom™ Processor (1.1 Ghz) running Windows CE. The unit also includes an integral commercial GPS receiver.

Technical Specification

Nominal screen size	10.4" (264mm) diagonal 212mm (H) x 158mm (V)
Screen pixel resolution	1024 Horizontal x 768 Vertical
Screen colours	262,144 (3 x 6 bit)
Screen viewing angles	Up to ±60° Horizontal and Vertical
Screen peak light output	200 Cd/m ² (at 25 °C)
Screen contrast ratio	500:1
Switches	25 pushbutton switches including a Master On/Off switch
Switch illumination	Green (with user adjustment between zero and full brightness)
Dimensions (excl.connectors)	241mm (H) x 306mm (W) x 70mm (D)
Operating temperature	-25 °C to +60 °C
Weight	6.5Kg
Display options	Integral Windows CE Processor Board
Options	Side or Rear Connectors



10.4" iMDU in Selex ES VANTAGE Mobile Moving Map Mode

15" SPECIALIST DISPLAY UNIT (SDU)

The 15" Specialist Display Unit has identical functionality and interfacing to the 10.4" Situational Awareness Display Unit, but has a larger display screen format. This unit would typically be suitable for a specialist operator who is using systems with high performance / high resolution output (e.g. a high resolution sensor display or detailed map display).

The SDU display is available with a touchscreen, enabling applications which require a more comprehensive user interaction with the display than possible with the soft-keys around the edge.



Technical Specification

Nominal screen size	15" (381mm) diagonal 304mm (H) x 229mm (V)
Screen pixel resolution	1024 Horizontal x 768 Vertical
Screen colours	262,144 (3 x 6 bit)
Screen viewing angles	Up to ±60° Horizontal and Vertical
Screen peak light output	200 Cd/m ² (at 25 °C)
Screen contrast ratio	500:1
Switches	25 pushbutton switches including a Master On/Off switch
Switch illumination	Green (with user adjustment between zero and full brightness)
Dimensions (excl.connectors)	315mm (H) x 393mm (W) x 82mm (D)
Operating temperature	-25 °C to +60 °C including solar loading
Weight	12.5Kg
Options	Touchscreen