

**Correctional Service Canada
Technical Services Branch
Electronics Systems**

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**ELECTRONICS ENGINEERING
STANDARDS**

**VIDEO DISPLAY UNIT
ELECTRONIC SYSTEMS**

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1.0 SCOPE

This standard defines the requirements of the Correctional Service of Canada (CSC) for the Video Display Unit (VDU) for use at federal correctional institutions.

2.0 GENERAL

Video Display Units interface the various electronic security systems to the operator in the Control Posts. The VDU annunciates real time events, displays system status and allows the operator to fully supervise, manage and control the systems as required. These units are mounted in locations on consoles according to functional priority and ease of operators visual monitoring of the display and controls.

3.0 ENVIRONMENTAL CONDITIONS

The system shall meet all requirements over the following operating range:

- 3.1 Temperature: 0° C to 50° C; and
- 3.2 Humidity: up to 95% non-condensing.

4.0 POWER REQUIREMENTS

The equipment shall be powered from standard commercial VAC within the following range:

- 4.1 Voltage: 120 VAC \pm 10%;
- 4.2 Frequency: 60 Hz \pm 1.5%;
- 4.3 Power: not to exceed 100 watts; and
- 4.4 Transients: input power fluctuations up to five times nominal voltages for up to 100 msec durations shall not cause damage to the unit.

Following any power failure, the system shall return to the operating mode which was in use prior to the power failure.

5.0 MECHANICAL REQUIREMENTS

The maximum dimensions for the equipment shall be within the following limits:

- 5.1.1 Height: 400 mm;
- 5.1.2 Width: 480 mm;
- 5.1.3 Length: 500 mm.

6.0 DESIGN REQUIREMENTS

- 6.1 The VDU shall be rack mountable to EIA RS-310-C Rack Standards, designed to be mounted in a console.
 - 6.2 The display screen shall be touch-sensitive and shall not be <14" diagonally.
 - 6.3 The following screen colour shall indicate the associated functions:
 - a. FLASHING RED shall be used only to denote alarm conditions which require operator action to be taken without undue delay to avert possible personnel injury, equipment damage, or both.
 - b. RED shall be used to indicate an acknowledged alarm situation.
 - c. YELLOW shall be used to alert the operator to conditions requiring attention, or to indicate that the system is in an unsafe state, such as unlocked cell doors or masked perimeter sectors, requiring caution.
 - d. GREEN shall be used in contrast to red or yellow to indicate the system is in a safe state.
 - e. WHITE shall be used to indicate system conditions which do not have safe or dangerous implications.
 - 6.5 Various systems shall use audible signals to alert the operator as follows:
 - a. Audible signals shall be clearly audible at any position the operator will occupy while on duty.
 - b. Frequency of a signal shall be between 500 and 5000 Hz, and preferably between 500 and 3000 Hz.
 - c. The operator shall be able to test each signal.
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- d. Volume of the signal shall be adjustable, either by the operator or by an internal adjustment to the module. The operator shall not be able to disable the signal by making it inaudible.
- 6.6 The following classes of audible signals shall be used on the console. They must be easily distinguished.
- a. **Confirmation'** - a short tone, usually about 0.5 seconds, used to acknowledge an operator action. The same tone shall be used to confirm all console operations for which an audible confirmation is required.
 - b. **'Warning'** - a short tone, usually about 0.5 seconds, used to warn the operator that an action cannot be carried out because of conflict or error, or that a nonstandard action has been initiated. The same warning tone shall be used for all console operations for which a warning tone is specified.
 - c. **'Annunciation'** - continuous tone used to indicate a request for action by the operator. More than one such tone may be used for different console functions.
 - d. **'Alarm'** - continuous tone warning for a dangerous situation. More than one such tone may be used for different console functions.
- 6.7 The following requirements for screen touch sensitive buttons are as follows:
- a. A positive indication of button activation shall be provided.
 - b. Dimensions and spacing shall be as defined in the individual panel standards.
- 6.8 Screen touch sensitive buttons shall be separated by >13 mm to prevent unintentional actuation.
- 6.9 Grouped buttons designed for sequential operation, for example numeric keypads, require separation >6 mm.
- 7.0 **SOFTWARE REQUIREMENTS**
- 7.1 Security system software shall be developed and proven Commercial-Off-The-Shelf (COTS) software unless otherwise specified and shall allow the upgrade of the CPUs without changes in the operation of the software.
 - 7.2 The software shall use Graphics Interface techniques and menu selections to interact with the user.
 - 7.3 The system shall be capable of running third party software concurrently with the security system software.
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- 7.4 Man/machine interfaces shall be in English or French language text depending on the specific institution.
- 7.5 The system shall provide a method by which a historical report may be backed up on floppy disk for storage and later recall.
- 7.6 The report archive method shall ensure that no events are lost in the transfer from hard disk to the archive media.
- 7.7 The disk space for the historical report shall be reclaimed for use in an oldest-first order.
- 7.8 The system shall have the ability to maintain a historical report of changes made to the databases and record the date and time of the change.
- 7.9 The system shall provide a means of archiving databases to a floppy disk for long term storage.
- 7.10 Any future software revisions shall be backward compatible with previous software releases.

8.0 **FUNCTIONAL REQUIREMENTS**

8.1 **Cell Lights and Power**

The following VDU display design shall be used for the cell lights and power control:

- 8.1.1 One screen touch-sensitive button for each cell. Each button will be labelled with a cell identification. The button shall be illuminated by a white light.
- 8.1.2 Two indicators for each cell push button, one labelled 'light', the second labelled 'power'.
- 8.1.3 One screen touch-sensitive button for each group of cells. The group shall be defined by lines enclosing the individual cell push buttons. This button shall also have 'light' and 'power' indicators.
- 8.1.4 Individual cells shall be selected by pushing the appropriate screen touch-sensitive buttons; the buttons of the selected cells will be illuminated as they are selected.
- 8.1.5 If a selected cell button is pressed again, the cell will be deselected, and the button illumination turned off.
- 8.1.6 If a group cell button is depressed, it shall be illuminated. Any cells previously selected will be deselected, then all cells in the group will be selected. The group cell button shall be illuminated but the individual cell buttons in the selected group will not be illuminated.

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- 8.1.7 A group may be deselected by pressing the screen touch-sensitive group button again; individual cells cannot be removed from a selected group.
 - 8.1.8 When the cell light buttons are pressed, the following actions shall be taken for lights in all selected cells:
 - a. 'ON' all lights will be turned on.
 - b. 'OFF' all lights will be turned off.
 - 8.1.9 When the cell power buttons are pressed, the following actions shall be taken for power to all selected cells:
 - a. 'ON' power will be turned on to all selected cells.
 - b. 'OFF' power will be turned off to all selected cells.
 - 8.1.10 The light and power buttons shall have no effect on unselected cells, they will remain in their previous state.
 - 8.1.11 The screen touch-sensitive buttons for each cell shall be illuminated if the power or lights for that cell are in the 'ON' state.

8.2 Other Lighting

Each set of lights to be controlled shall have a separate section on the VDU with the following controls:

- 8.2.1 One white screen touch-sensitive button, labelled 'OFF', and 'ON'.
- 8.2.2 If a light dimmer is required, The touch-sensitive button shall have at 10 levels of control and the intensity shall have an approximately linear relationship with scale positions.
- 8.2.3 Touching the screen touch-sensitive button turns the lights off or turns the lights on. It shall be illuminated if the lights are on.
- 8.2.4 The dimmer setting shall be retained when the lights are turned off or on.

8.3 Cell Door Control

A cell door control VDU display shall be used to control the locks as follows:

- 8.3.1 The control screen shall be arranged to have four colour coded touch screen-sensitive buttons for each cell labelled 'OPEN', 'CLOSE', 'GROUP' and 'STOP', as well as two buttons labelled 'GROUP OPEN' and 'GROUP CLOSED'.

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- 8.3.2 The touch screen-sensitive buttons shall be arranged in a mimic format. They will be separated sufficiently to prevent accidental keying.
 - 8.3.3 The 'OPEN' touch screen-sensitive button shall unlock and open the associated cell door. The touch screen-sensitive button shall illuminate red, and remain illuminated as long as the cell remains unlocked. The 'OPEN' button shall flash red while the cell door is not in a fully open position.
 - 8.3.4 The 'CLOSE' touch screen-sensitive button shall close and lock the associated cell door. The button shall illuminate green and remain illuminated as long as the cell remains closed and locked. The 'CLOSE' button shall flash green while the cell door is not in a locked position.
 - 8.3.5 The 'GROUP' touch screen-sensitive button will act as a toggle switch to select and de-select the cell doors to be included or excluded from the group-type action. The 'GROUP' touch screen-sensitive button shall illuminate amber when the door has been selected to be included in the 'GROUP' function.
 - 8.3.6 The 'GROUP CLOSE' touch screen-sensitive button shall close and lock all group selected cells with the appropriate indications as outlined above.
 - 8.3.7 The 'GROUP OPEN' touch screen-sensitive button shall unlock and open all group selected cells with the appropriate indications as outlined above.
 - 8.3.8 The 'STOP' touch screen-sensitive button shall interrupt the closing or opening of the doors. When selected, the 'STOP' button shall illuminate red

8.4 **Other Doors**

The system may have to control doors other than cell doors; for example fire doors or doors between sections of the institution. The screen touch-sensitive VDU display control shall be designed in the same way as the cell control doors. There shall be a separate display or region on the display for each type of door controlled.

8.5 **Movement Control Barriers**

Controls for control barriers shall be placed on a single touch-sensitive screen as follows:

- 8.5.1 For each barrier controlled, the screen touch-sensitive buttons, shall be labelled 'OPEN', 'STOP', and 'CLOSE'. The 'OPEN' and 'CLOSE' buttons shall have white illumination. The 'STOP' button shall have red illumination.
- 8.5.2 The layout of the controls shall reflect the physical location of the barriers.

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- 8.5.3 Pushing 'OPEN' shall open the associated barrier. The screen touch-sensitive button shall flash as the barrier opens, when it is fully open the button shall light continuously, and remain lit as long as the barrier is open. There shall be audible confirmation of the action.
 - 8.5.4 Pushing 'CLOSE' shall close the barrier. The screen touch-sensitive button shall flash as the barrier closes, when it is fully closed, the button shall light continuously, and remain lit as long as it is closed. There shall be audible confirmation at the start of the action.
 - 8.5.5 If the barrier is moving, then pushing the 'STOP' button shall immediately stop the motion. There shall be audible confirmation of the action. The light on the open or close button shall turn off, and the stop button shall light up and remain lit until the 'OPEN' or 'CLOSE' buttons are pressed, and motion resumes.
 - 8.5.6 If the barrier is not moving when the screen touch-sensitive stop button is pressed, no action shall be taken, the barrier shall remain in its previous state, and the button lights shall not change. There shall be an audible warning.
 - 8.5.7 If an attempt is made to open a barrier which is interlocked and unable to open, then an audible warning shall sound and no action shall be taken.
 - 8.5.8 If the interlock disable button is pressed, all interlocks shall be disabled, and all barriers may be opened. When the button is pressed, an audible warning shall sound and the button shall be illuminated.
 - 8.5.9 The interlock can be reenabled by pressing the disable button again, with the barriers in a legal position. There shall be an audible confirmation of this action. If the barriers are not in a legal position, there shall be an audible warning and no action shall occur.

8.6 Fire Alarms

The system may monitor a number of fire alarms and shall be displayed on a single screen display as follows:

- 8.6.1 The display shall have a red light for each alarm.
- 8.6.2 Each light shall be labelled with the identification of location of the associated alarm. If possible, the lights shall mimic the alarm placement in the institution.
- 8.6.3 There shall be a single 'ACKNOWLEDGE' screen touch-sensitive button on the display, clearly separated from the indicator lights.
- 8.6.4 When a fire alarm is activated, the associated red panel light shall start flashing and an audible alarm shall sound.

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- 8.6.5 The operator acknowledges the alarm by pressing the 'ACKNOWLEDGE' screen touch sensitive button, the red light stops flashing and remains on and the audible alarm stops.
 - 8.6.6 The alarm must be reset from the site of the alarm, it cannot be reset from the console.
 - 8.6.7 If more than one alarm has been triggered, the acknowledge button shall acknowledge all alarms.

8.7 Mechanical Systems

A number of mechanical systems, such as fans shall be controlled from a single screen display as follows:

- 8.7.1 Each system shall have a white screen touch-sensitive button, labelled 'ON'.
- 8.7.2 Each button shall be labelled showing the function of the controlled device.
- 8.7.3 The device is turned on and off using the appropriate screen touch-sensitive buttons.
- 8.7.4 If the device is in the 'ON' state, then the button shall be illuminated.

8.8 Inmate Call System Primary Annunciation Panel

The inmate call system shall be monitored from a single screen display as follows:

- 8.8.1 There shall be one screen touch-sensitive button per cell, the "Cell Call" button, with split yellow and white illumination areas.
- 8.8.2 There shall be one white screen touch-sensitive "ACKNOWLEDGE" button and one yellow "DISABLE" button.
- 8.8.3 There shall be a "Push to Talk" (PTT) button.
- 8.8.4 When an inmate activates his call button, the associated cell button shall start to flash, and there shall be a continuous audible annunciation.
- 8.8.5 The operator shall acknowledge the call by pressing the "ACKNOWLEDGE" button. The audible annunciation shall stop, but light shall continue flashing.
- 8.8.6 The operator can then listen to the inmate by pressing the call button. The light shall stop flashing and illuminate continuously.
- 8.8.7 The operator can talk to the inmate by pressing the PTT button.
- 8.8.8 When the call is finished the operator can cancel the call by pressing the associated touch-sensitive "CALL" button again. The light shall go off.

- 8.8.9 If a call has been triggered and not yet cancelled then triggering it again shall have no effect.
- 8.8.10 The operator can disable the call system for an inmate by pressing the "DISABLE" button and the cell button simultaneously. The yellow portion of the cell button shall light up and any calls shall be ignored.
- 8.8.11 Pressing the cell button and the "DISABLE" button a second time shall restore the call system to normal operation.
- 8.8.12 If the "DISABLE" and cell buttons are pressed while a call is being processed it shall disable the system from further calls, but shall not cancel the current call.
- 8.8.13 If an intercom is included in the system the operator can listen to any cell at any time by pressing the associated cell button. The button shall illuminate. Listening is stopped by pressing the button again.
- 8.8.14 If more than one cell call is triggered all calls shall be acknowledged by the "ACKNOWLEDGE" button.

8.9 Inmate Call System Secondary Annunciation Panel

Back up monitoring for the ICS is provided by a secondary panel at another location. This display shall monitor zones, where each zone is controlled by one or more primary panels at a single location.

- 8.9.1 There shall be one illumination light with yellow and white illumination areas for each zone.
- 8.9.2 There shall be one white 'ACKNOWLEDGE' button and one white 'TEST' button arranged.
- 8.9.3 If a cell call is not acknowledged at the primary panel for a zone, then after a preset length of time, the secondary panel yellow 'CALL' light for that zone shall flash and there shall be an audible annunciation.
- 8.9.4 The secondary panel operator can acknowledge the call by pressing the 'ACKNOWLEDGE' button. The audible annunciation shall stop and light shall illuminate steadily.
- 8.9.5 The light shall be extinguished when the call is cancelled from the primary panel.
- 8.9.6 If any cell calls in a zone are disabled, the white 'disabled' light on the corresponding secondary panel zone shall be illuminated.

8.10 **FIXED POINT SECURITY ALARMS**

A number of Fixed Point Security Alarms (FPSA) may be monitored from a single display as follows:

- 8.10.1 Each FPSA location shall have a screen touch-sensitive red push button on the display.
- 8.10.2 Each button shall be labelled to indicate its location.
- 8.10.3 There shall be a screen touch-sensitive 'ACKNOWLEDGE' push button in the lower right-hand corner of the display.
- 8.10.4 When an FPSA is activated, the associated button on the panel shall start flashing and an audible alarm shall sound.
- 8.10.5 The operator responds by pressing the 'ACKNOWLEDGE' button. The light shall stop flashing and burn continuously and the audible alarm shall stop.
- 8.10.6 The FPSA can be reset by pressing the illuminated button; this shall turn off the light.

8.11 **Facility Alarms**

The MCCP may be required to monitor a large number of alarms of various types, such as mechanical, fixed point alarms, and portable personal alarms. These can all be monitored from one VDU display.

- 8.11.1 The alarms shall be grouped by type.
- 8.11.2 Each alarm shall have an illuminated red push button on the screen.
- 8.11.3 Each screen touch-sensitive button shall be labelled to indicate the location of the alarm.
- 8.11.4 There shall be a screen touch-sensitive 'ACKNOWLEDGE' button in the lower right-hand corner of the screen.
- 8.11.5 When an alarm is triggered, the associated button shall start flashing and an audible alarm shall sound.
- 8.11.6 The operator responds by pressing the 'ACKNOWLEDGE' button. The light shall stop flashing and burn continuously and the audible alarm shall stop.
- 8.11.7 The alarm can be reset by pressing the illuminated button; this shall turn off the light, provided the alarm has also been reset at its origin if required.