

Springhill Institution Building 57 Springhill, NS



Workstation Touch Screen Theory of Operations



SYSTEM INTEGRATOR

InTouch® 10.0

*Updated Per
Conference Call
01/22/13*



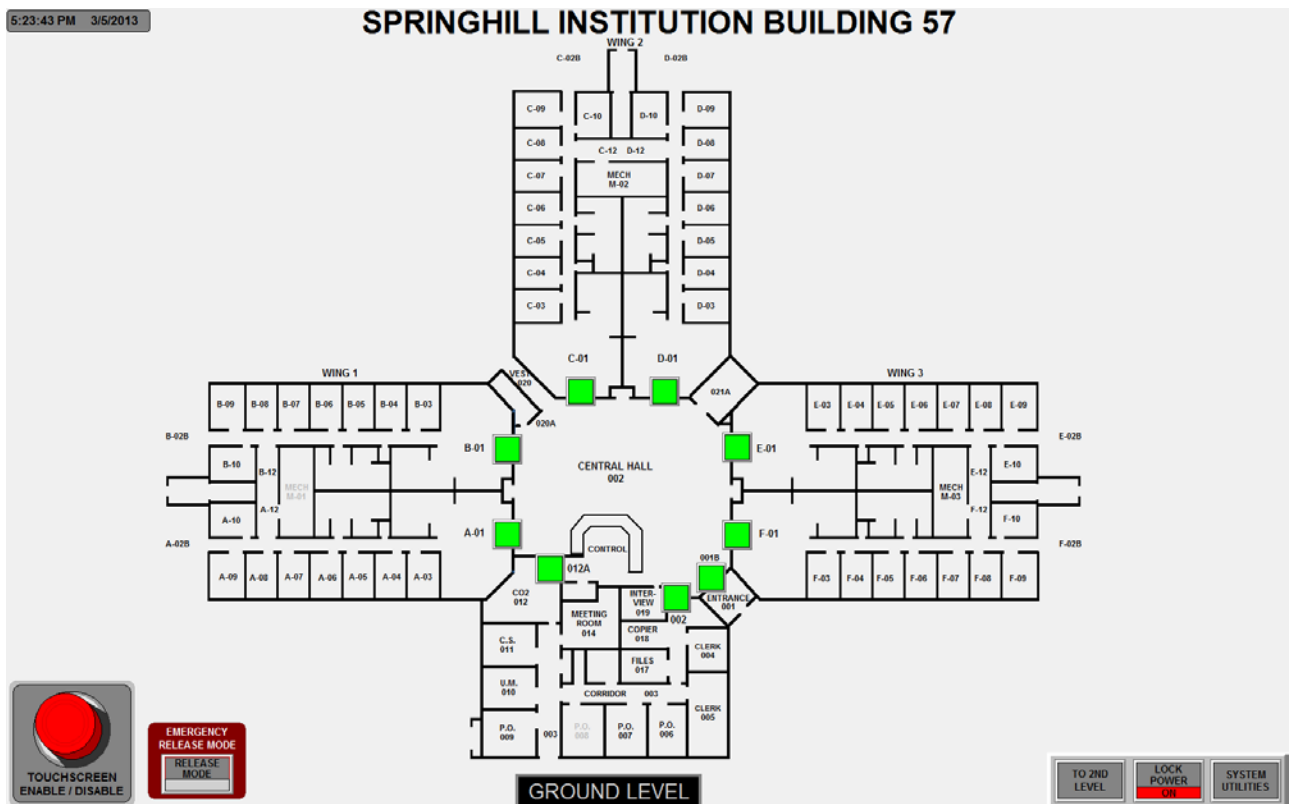
Windows 7™

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Introduction - SYSTEM OVERVIEW

The security electronics system design for this project is for control and monitoring of a detention center consisting of two touchscreen Computers. The Dell rack-mounted Computer Servers are located in the TER 103 room on the 2nd Level and the two 22" ELO touch monitors are located in the Control Post in 002 Central Hall on the 1st Level. Each CPU operates on the Windows Server R2 platform and integrated with the security electronics system. The system consist of door control and miscellaneous control operations. The door control operation system has momentary unlock/lock for typical common area swing doors, maintain lock/unlock for "Fire Exit" swing doors and for apartment doors - power enable, allowing the door's pushbutton (REX - request to exit), and Key-switch to unlock the door during the day and power removal during the night. "Monitor Only" doors allow the operator to view the status of a uncontrolled door. All doors have unauthorized access alarm functions, alerting the operator that the door has been unlocked and or opened by a key and prop alarms alerting the operator that the door has been left open. Another lock function is "Emergency Release." The System utilities control operations are for miscellaneous controls including Touch Screen Calibration, Clean Screen and Network Status. The operator navigates between floorplans via a level switch located at the lower right of the map screens on the footer. The various functions and the operations of those contained in the control software are detailed in this manual.



1st Level Locking Floor Plan

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Section 1 – Computer Workstation

System Control and Annunciation

The graphical map, or screen, for this system is comprised of three separate sections. The first section, or the Building Layout Section, contains the physical layout of the different areas of the facility and the screen controls (See Figure 1.1). If physically possible the complete floorplan will be placed on one screen, depending on the monitor capabilities and touch icons proximity area to each other. The second section is the Footer menu (See Figure 1.2), containing the travel switch, (“TO 2ND LEVEL” or “TO 1ST LEVEL”), and the “LOCK POWER,” and “SYSTEM UTILITIES” switches. The SYSTEM UTILITIES icon takes the operator to the System Utilities Screen, allowing the operator to monitor and perform various diagnostic tasks. See the System Utilities section for more details. The third section is the door function popups, consisting of various control popups for a particular type door. The various types are “DOOR ACTION,” “DOOR ALARM,” “DOOR INMATE CONTROL,” and “DOOR MAINTENANCE” popups, (See Figure 1.3). See the door control and alarm sections for more details of these systems. All switch and or button icons on the touchscreen for all systems, may be selected by the operator by touch.

Figure 1.1

Figure 1.3

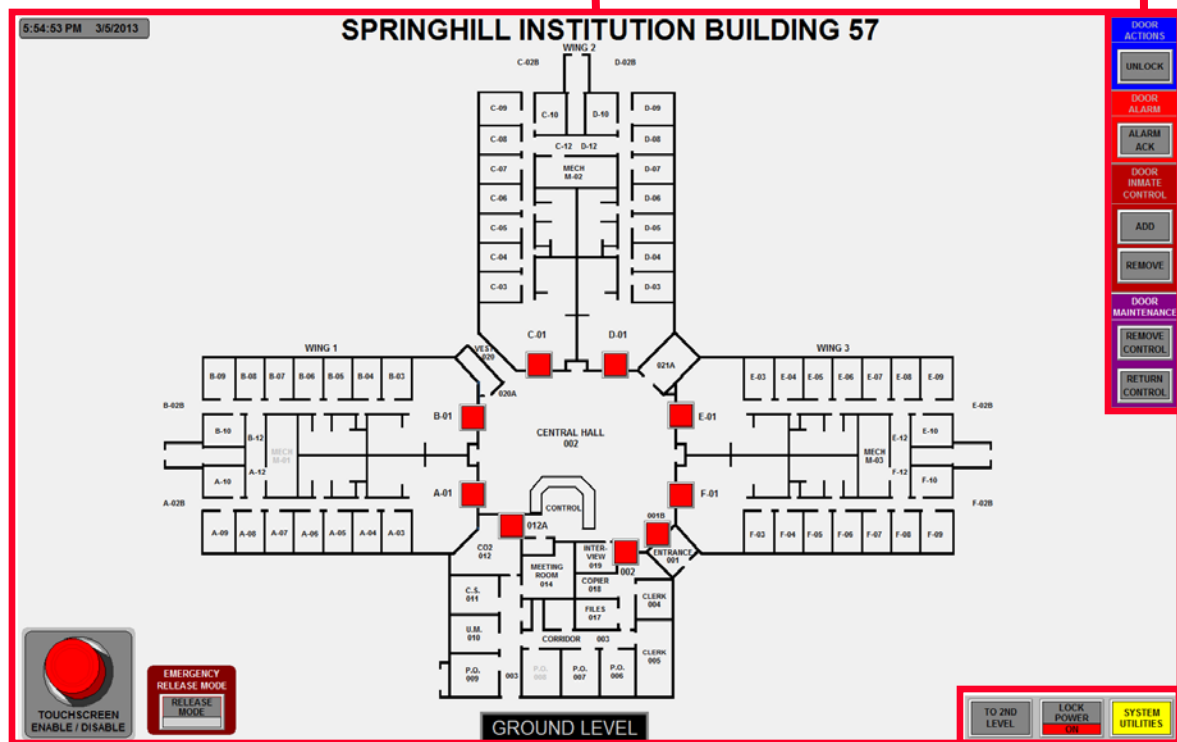


Figure 1.2

Section 2 – Door Control Operations

Common Controlled Swing Doors

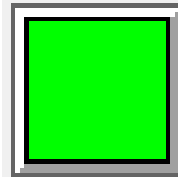


Figure 2.1

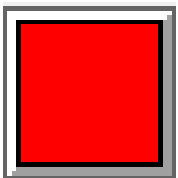


Figure 2.2

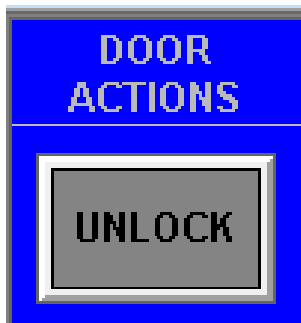


Figure 2.3

Common controlled swing doors are represented by a icon resembling a square indication color banner and switch. The color and condition of the icon changes depending on the state of the door. (locked and secure or unlocked and un-secure).

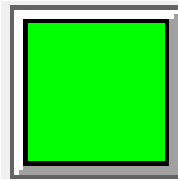
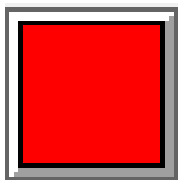
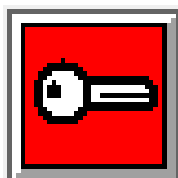
If the door is locked and secure, the square banner appears green, (See Figure 2.1). The banner changes to red, (See Figure 2.2) once the door is unsecured.

Selection of the door's pushbutton, produces popups pertaining to that door's particular actions that may be performed, depending on the state of the door at the time. For a typical swing door, three popups are associated with it. The first is the "DOOR ACTION" popup with a "UNLOCK" switch, (See Figure 2.3). Second, would be the "DOOR ALARM" popup with a "ALARM ACK" switch. The third, is the "DOOR MAINTENANCE" popup with "REMOVE CONTROL" and "RETURN CONTROL" switches. If one or more of the actions for a door in a particular state does not relate to the real-time functions of that door they do not appear, for example: if a selected door does not have an active alarm, the "DOOR ALARM" popup will not appear.

Selecting the "UNLOCK" switch on the "DOOR ACTION" popup, unlocks the door and updates the green square indication to red. "LOCK" switches are not needed, because all locks are full-cycle, meaning the lock bolt returns to the extended position automatically. The "DOOR ALARM" and "DOOR MAINTENANCE" popups will be explained on the following pages of this theory.

Section 2 – Door Control Operations

Apartment (REX / Key switch) Inmate Control Doors

**Figure 2.4****Figure 2.5****Figure 2.6****Figure 2.7**

Apartment power enable swing doors are represented by a icon resembling a square indication color banner and switch behind it. The color and condition of the icon changes depending on the state of the door. There are multiple states for an Apartment door, depending on the physical status of the door as well as the operational mode determined by the touchscreen operator, (Day mode with powered REX and key switch or Night mode with power removed).

If the door is locked and secure, the square banner is green, (See Figure 2.4). Once the door becomes unsecure, physically or by relinquishing local, (inmate) control the square banner appears red, (See Figure 2.5). This indication monitors both the physical status of the door/lock and the mode of the door, (day or night), as determined by the touchscreen operator.

Selection of the door's pushbutton, produces popups pertaining to that door's particular action that may be performed depending on the state of the door at the time. For a Apartment door, four popups are associated with it. The first three are "DOOR ACTION," "DOOR ALARM" and the "DOOR MAINTENANCE" popups, previously described on page 3. The fourth popup is the "DOOR INMATE CONTROL," containing the "ADD" and REMOVE" switches, (See Figure 2.6). If one or more of the actions for a door in a particular state does not relate to the real-time functions of that door they do not appear, for example: if a selected door does not have an active alarm, the "ALARM ACK" icon will not appear.

Once a Apartment door switch is selected, producing the "DOOR INMATE CONTROL" popup, selecting the "ADD" switch allows the door's local control to be enabled, ("Day mode"). Once selected the square door switch indication appears red with a white key-shaped icon inside, (See Figure 2.7). In this state, the door may be opened, on either side, by the REX, (request to exit), switch on the inmate side or the key switch on the officer side. Selection of the "REMOVE" switch disables both the REX and Keyswitch for that particular door and returns the square indication banner to green and removes the key-shaped icon, indicating that the apartment door's rex and keyswitch power has been removed, ("Night mode") and that the door is now in a secure state, (if closed and locked).

Section 2 – Door Control Operations (cont'd)

Apartment (REX / Key switch) Inmate Control Doors (cont'd)

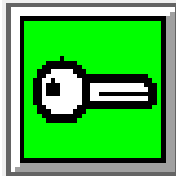


Figure 2.8

If a Apartment door's REX and keyswitch have been disabled/removed by the touchscreen operator and the REX pushbutton is selected by an inmate, a "Request to Exit" call is produced. A blinking white key icon appears on the associated door's green square switch indication, (See Figure 2.8), followed by an audible tone, alerting the operator that a request to exit call has been initiated. If both touchscreens are functioning properly, the call only appears on the dedicated touchscreen, (Building 57: left touchscreen – 1st floor; right touchscreen – 2nd floor). In the event that the operator is on another screen, (or the call is not a default of the other touchscreen), travel is automatic to the screen producing the call. The operator selects the flashing door switch, cancelling the call, silencing the audible tone and producing the door action popups. The touchscreen operator must then determine whether or not to return control to the inmate, using the "ADD" switch on the "DOOR INMATE CONTROL" popup, as previously explained. If inmate control is added by the touchscreen operator and the REX is selected again by the inmate, the door unlocks.

Owner's Note: The previous "Request to Exit" call indication was a flashing red square banner, but according to Mark Bottomley's Notes 01/22/13, an alarming door flashes red. Nothing in the notes described a "Request to Exit" call, so I came up with the flashing Key icon. If this is not acceptable, please note on review of theory.

Section 2 – Door Control Operations (cont'd)

Fire Exit Controlled Swing Doors

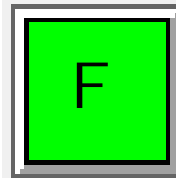


Figure 2.09

The only times Fire Exit controlled swing doors appear on the touchscreen are after confirmation of the “EMERGENCY RELEASE MODE,” or a “UA” or “PROP” alarm or if the door’s control has been removed from service via the “DOOR MAINTENANCE” popup.

Fire Exit swing doors are represented by a square indication color banner and switch with the letter “F”. The color and condition of the icon changes depending on the state of the door. (locked and secure or unlocked and un-secure).

If the door is locked and secure, the square banner appears green, (See Figure 2.09). The banner changes to red, (See Figure 2.10) once the door is unsecured.

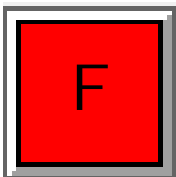


Figure 2.10

Operations of a Fire Exit door will be explained thoroughly in the Emergency Release Section on the next page.

Operator’s Note: It is possible that the Fire Exit doors are “half-cycle” locks, meaning the switch icon must be selected a second time to complete the lock cycle, (return the lock bolt to it’s secure position). Most typical doors have full-cycle locks, that retract and extend the lock bolt after only one switch selection.

Monitored Only (DPS Only) Swing Doors

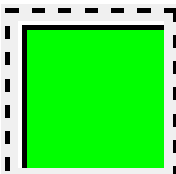


Figure 2.11

Monitored Only swing doors are only visible during an alarm condition or after verification of the “EMERGENCY RELEASE MODE” or if removed for maintenance. A monitored only door is represented by a square indication color banner and hidden switch. These doors are not controlled from the touchscreen, but the status of the door position switch is monitored. The color and condition of the icon changes depending on the state of the door (locked and secure or unlocked and un-secure).

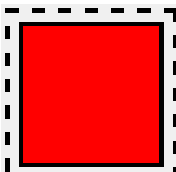


Figure 2.12

If the door is manually locked and secure, the square banner appears green, (See Figure 2.11). The banner changes to red, (See Figure 2.12) once the door is unsecured.

Section 2 – Door Control Operations (cont'd)

Emergency Group Release Control



Figure 2.13



Figure 2.14

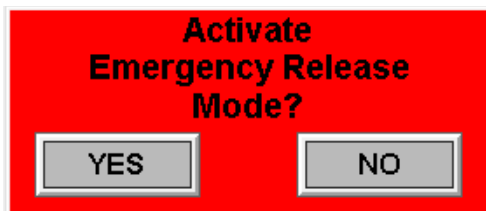


Figure 2.15

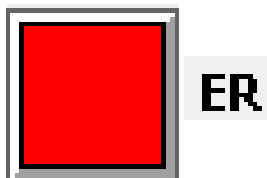


Figure 2.16

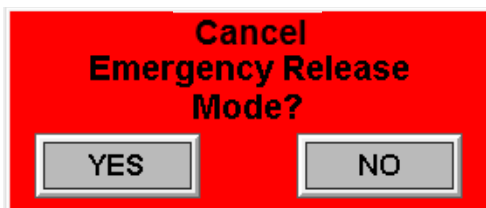


Figure 2.17

The Emergency Release operation enables the touchscreen operator to unlock all doors including dayroom doors and fire exits within the facility simultaneously in the event of an emergency (i.e. Fire Alarm Evacuation).

To initiate this command the operator selects the "EMERGENCY RELEASE MODE" - "RELEASE MODE" switch, (See Figure 2.13), producing a confirmation popup box (See Figure 2.15). This is a safety feature built in to insure this operation is not performed inadvertently. In the "Activate Emergency Release Mode?" confirmation popup box, the operator may select the "YES" icon to proceed or the "NO" icon to cancel. If the operator selects the "NO" icon, the confirmation box closes and the emergency release function is cancel. If the operator selects the "YES" icon, an audible tone sounds and the EMERGENCY RELEASE icon on the screen changes from grey to flashing red along with the text "ACTIVE" appearing within the switch icon (See Figure 2.14).

Once in the "EMERGENCY RELEASE MODE," all Fire Doors become visible on the screen joining the common swing doors. At this point any door switch selected, unlocks and remains unlocked until cancellation of the "EMERGENCY RELEASE MODE." Once a door is unlocked the square background changes to red with the flashing letters "ER" near the switch confirming that the door is unlocked and in emergency release mode, (See Figure 2.16).

To reset the "EMERGENCY RELEASE MODE" the operator selects the flashing red "RELEASE MODE ACTIVE" button on the screen, generating the "CANCEL EMERGENCY RELEASE MODE" confirmation popup (See Figure 2.17). If the operator does not wish to reset the operation at this time, he or she touches "NO," closing the window and continuing with the emergency release operation. Touching the "YES" icon cancels the emergency release function, closes the confirmation popup window and returns the "EMERGENCY RELEASE MODE" icon on the screen to its normal grey. After selection of the "YES" icon, all doors in emergency release, re-lock and once physically shut, if not a "Fire Door" indicate a green secure state. If the door is a Fire Exit, once it returns to a secure status the door is no longer visible on the screen.

Operator Note: Any doors in "LOCK-OUT" may still be Emergency Released by selecting the door switch once in the "EMERGENCY RELEASE MODE".

Section 2 – Door Control Operations (cont'd)

Door Unauthorized Access Alarms

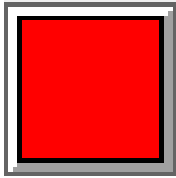


Figure 2.18

If a door is opened by any means other than the touchscreen operator or granted "INMATE CONTROL", an unauthorized access, (UA), alarm appears on the screen followed by an audible tone notifying the touchscreen operator of the alarm condition. An Unauthorized Access Alarm is represented by a flashing red square indication banner on the door switch icon, (See Figure 2.18).

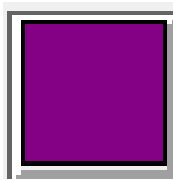


Figure 2.19

If both touchscreens are functioning properly, the alarm only appears on the dedicated touchscreen, (Building 57: left touchscreen – 1st floor; right touchscreen – 2nd floor). In the event that the operator is on another screen, (or the call or alarm is not a default of the other touchscreen), travel is automatic to the screen producing the alarm. Selection of the alarming door switch produces the action popups. The operator may select the "ALARM ACK" switch under the "DOOR ALARM" popup, (See Figure 2.20), to acknowledge the alarm and update the square indication to magenta, (See Figure 2.19). Once the door is re-secured the indication returns to green for a common or Apartment Door. If the re-secured door is a Fire Exit or Monitored only door, it totally disappears from the screen.



Figure 2.20

If the door is still unsecured, after "ALARM ACK" for more than 15 seconds, (or time determined by owner), the door will once again alarm on the screen with an audible tone, but this time as a "PROP." The alarm re-occurs after reset until that door is closed and secured in the allotted time.

Door Prop Alarms

If a door is left open for more than 15 seconds, (or time determined by owner), a prop alarm appears on the screen followed by an audible tone notifying the touchscreen operator of the alarm condition. A Prop Alarm is represented by a flashing red square indication banner on the door switch icon, (See Figure 2.18), same as a UA.

Selection of the alarming door switch produces the action popups. The operator may select the "ALARM ACK" switch under the "DOOR ALARM" popup, (See Figure 2.20), to acknowledge the alarm and update the square indication to magenta, (See Figure 2.19). Once the door is re-secured the indication returns to green for a common or Apartment Door. If the re-secured door is a Fire Exit or Monitored only door, it totally disappears from the screen. A "PROP" alarm is handled the same way as a previously described "UA" alarm.

Section 2 – Door Control Operations (cont'd)

Alarm Travel

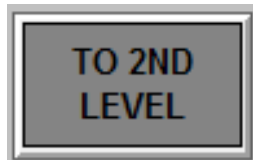


Figure 2.21

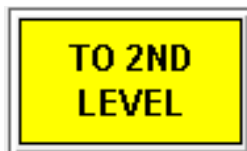


Figure 2.22



Figure 2.23

If one of the two touchscreens is off-line, the level travel switch on the footer, alerts the working touchscreen operator that he or she has a un-assigned call or alarm on the other floor. If the touchscreen operator is viewing the first floorplan and the “TO 2ND LEVEL” switch begins flashing yellow, he or she has a request to exit call” (See Figure 2.22), if the switch is flashing red the operator has a door alarm, (See Figure 2.23). The level switch returns to grey, (See Figure 2.21), once there are no longer any other unacknowledged calls or alarms on the un-assigned level, because of a off-line touchscreen.

Operator Note: The level switch text reads “TO 1ST LEVEL” on second level floorplan.

Door Lock Power



Figure 2.24

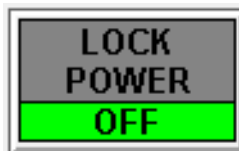


Figure 2.25

The touchscreen has a “LOCK POWER” switch located on the footer. During regular daytime operations the switch indication is red with the text “ON,” (See Figure 2.24). At night, the owner would like to be able to kill power to the locks, insuring that a door is not accidentally opened. To kill the power, he or she selects the “LOCK POWER” switch changing the indication to green with the text “OFF,” (See Figure 2.25). If the door is a Apartment door, the REX and Keyswitch are not useable, during “LOCK POWER OFF.” With the “LOCK POWER OFF” the door’s status indication on the touchscreen is still true and will not be effected. The relays controlling the power are stepped, (rippled), during on/off control, to limited the in-rush of power.

Operator Note: Even in the “LOCK POWER OFF” state, if the touchscreen operator elects to go into the “EMERGENCY RELEASE MODE” the lock power is automatically restored.

Section 2 – Door Control Operations (cont'd)

Door Maintenance

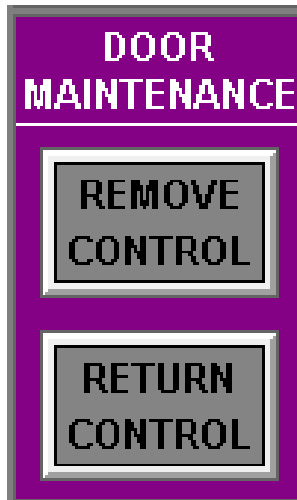


Figure 2.26

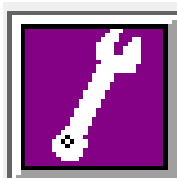


Figure 2.27

The "DOOR MAINTENANCE" popup allows the touchscreen operator to "REMOVE CONTROL," if a door has maintenance issues and "RETURN CONTROL," once the door has been repaired. This operation is particularly beneficial, once a door continuously sends false alarms creating a nuisance to the operator. After the door is repaired by maintenance, it can be return to normal control by selection of the "RETURN CONTROL" switch.

Selection of the door's pushbutton, produces popups pertaining to that door's particular actions that may be performed, depending on the state of the door at the time. One of these is the "DOOR MAINTENANCE" popup with "REMOVE CONTROL" and "RETURN CONTROL" switches, (See Figure 2.26). Once the operator has selected a door switch, followed by the "REMOVE CONTROL" switch on the popup, a magenta square background field appears with a white wrench, (See Figure 2.27), signifying that the door has been removed from control for maintenance purposes. In this state the door will no longer alarm or can it be unlocked by the touchscreen operator, until control has been returned. The operator may return control by selecting the magenta door switch a second time producing the "DOOR MAINTENANCE" popup and touching the "RETURN CONTROL" switch. Once control has been returned the white wrench icon and magenta square indication updates to the true state of the door, green for secure or red for un-secure.

The only way to "REMOVE" a "FIRE DOOR" or "Monitor Only" door for maintenance purposes, is during a alarm condition, (UA or PROP), seeing that these types of doors are invisible on the screen during typical operations. The door switch will appear on screen once the door is in alarm, and the operator can select it, producing the "DOOR MAINTENANCE" popup. At this point the scenario is the same as previously explained.

Operator Note: Doors that have had the control removed may still be unlocked in the "EMERGENCY RELEASE MODE," without selecting the "RETURN CONTROL" switch prior.

Section 3 – Panic Shutdown

Touchscreen Panic/Disable

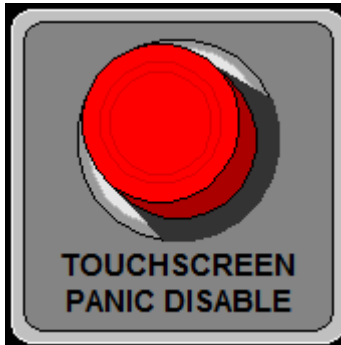


Figure 3.1

A “TOUCHSCREEN PANIC DISABLE” button, (See Figure 3.1), is located at the bottom left corner of each touchscreen. Selection of the “TOUCHSCREEN PANIC DISABLE” button removes operation from the touchscreen and produces a red popup locally, (See Figure 3.2) instructing the operator that he or she must “Contact Maintenance For System Reset.”

During this condition maintenance or an officer with keys to the main equipment room, must physically reset the system using a keyed pushbutton mounted in the PLC equipment rack. Once reset both touchscreens return to the floorplan screens.

TOUCHSCREEN STATION
PANIC / DISABLED
(Contact Maintenance For System Reset)

Figure 3.2

Section 4 - Miscellaneous Control Operations.

System Utilities Screen



Figure 4.1

The System Utilities Screen contains various maintenance and configuration functions for the system operations (See Figure 4.2). The icon to access the System Utilities screen is at the bottom of the screen on the footer (See Figure 4.1). The following tasks can be performed:

System Utilities Screen

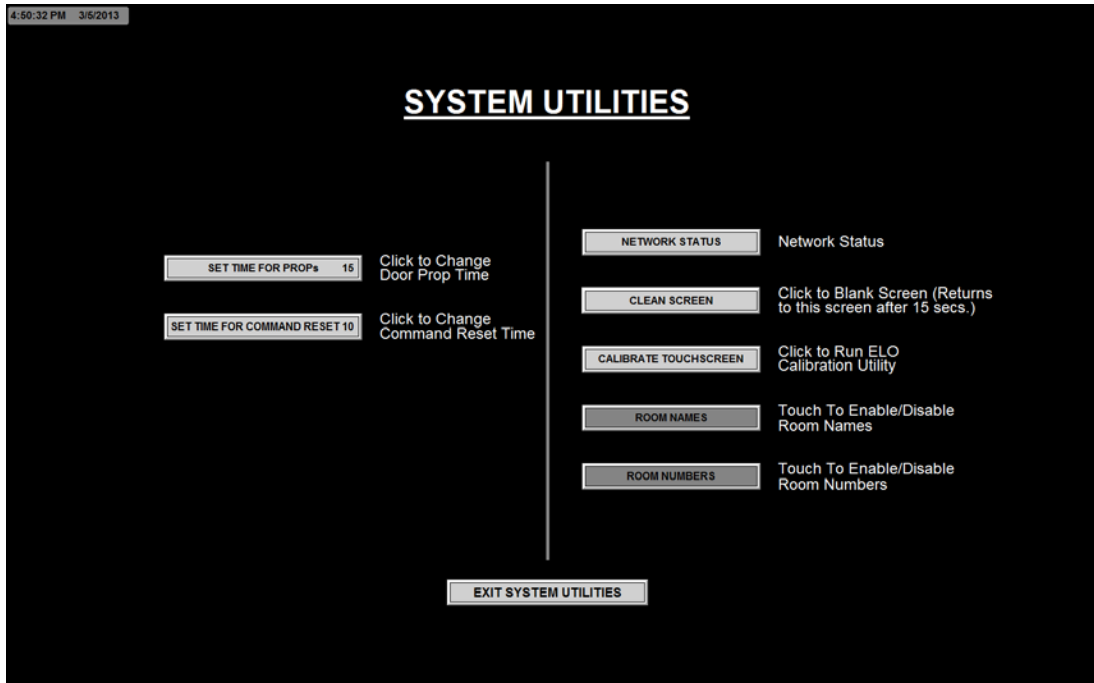


Figure 4.2



Figure 4.3

Network Status: This operation gives the operator the status of the PLC network and if any nodes have dropped off of the network. If the PLC does drop off, the operator is notified. The operator may select the NETWORK STATUS icon (See Figure 4.3) to check status at any time.

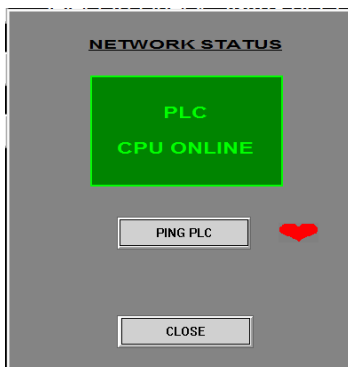


Figure 4.4

If the integrity of the communication between the touchscreen and the PLC is good, the "PLC CPU ONLINE" icon is green, (See Figure 4.4). If communications is lost an alarm tone sounds and the "PLC CPU OFFLINE" icon appears red, (See Figure 4.5). The "PING PLC" is explained on page 13.

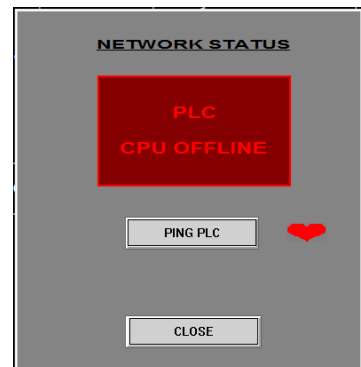


Figure 4.5

Section 4 - Miscellaneous Control Operations (cont'd)

System Utilities Screen

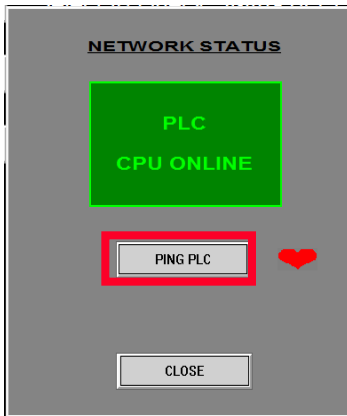


Figure 4.6

PING PLC: Selection of the “PING PLC” icon located on the “NETWORK STATUS” screen, (See Figure 4.6), produces the touchscreen computer’s CMD, (dos prompt), sending an “IP” address message to poll the PLC’s Ethernet Module, (Omron EIP-21). This operation confirms communication between the touchscreen and the PLC’s Ethernet Module, (See Figure 4.7). If the touchscreen does not receive confirmation messages, the operator knows that communication has been lost.

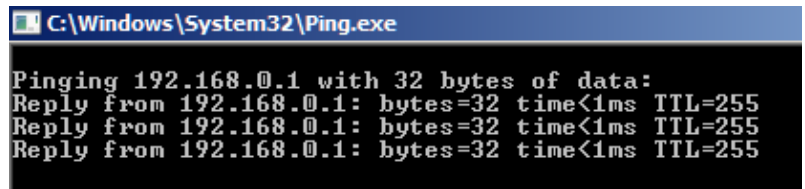


Figure 4.7



Figure 4.8

Clean Screen: selection of the “CLEAN SCREEN” icon (See Figure 4.8), produces a non-active screen, allowing the operator to clean the touch screen, (dry cloth only), without activating any commands within the system. The operator is given thirty (30) seconds to wipe down the screen, (See Figure 4.9). The operator is also given a 10 second warning prior to the allotted time ending, to avoid accidental activation of operations in the system, (See Figure 4.10).

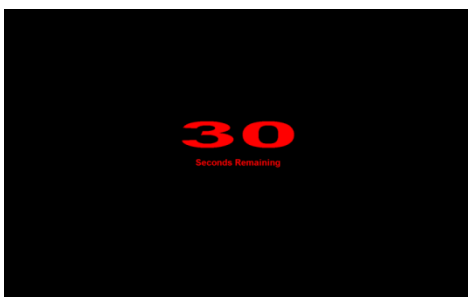


Figure 4.9



Figure 4.10



Figure 4.11

Calibrate Touchscreen: Calibrating the touchscreen ensures the operator is selecting the correct point or area on the touchscreen. The operator selects the “CALIBRATE TOUCHSCREEN” icon (See Figure 4.11), running the ELO utility. Once opened the utility guides the operator through setting the calibration for the touchscreen.

Section 4 - Miscellaneous Control Operations (cont'd)

System Utilities Screen



Figure 4.12

Room Name Visibility: Switch the operator may use to turn on and off the Room Names in the application (See Figure 4.12).



Figure 4.13

Room Number Visibility: Switch the operator may use to turn on and off the Room Numbers in the application (See Figure 4.13).



Figure 4.14

Set Time For PROPs: Selection allows the operator to enter a new time in seconds prior to a PROP Alarm, (See Figure 4.14).



Figure 4.15

Set Time For Command Reset: Selection allows the operator to enter a new time in seconds prior to selected command reset, (See Figure 4.15).

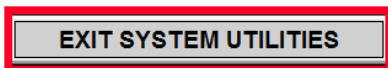


Figure 4.16

Exit System Utilities: Selection closes the "System Utilities popup screen, (See Figure 4.16).