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CUSTOM R5000 & SECURESWITCH REV B SWITCHING SYSTEM INSTALLATION & OPERATION GUIDE

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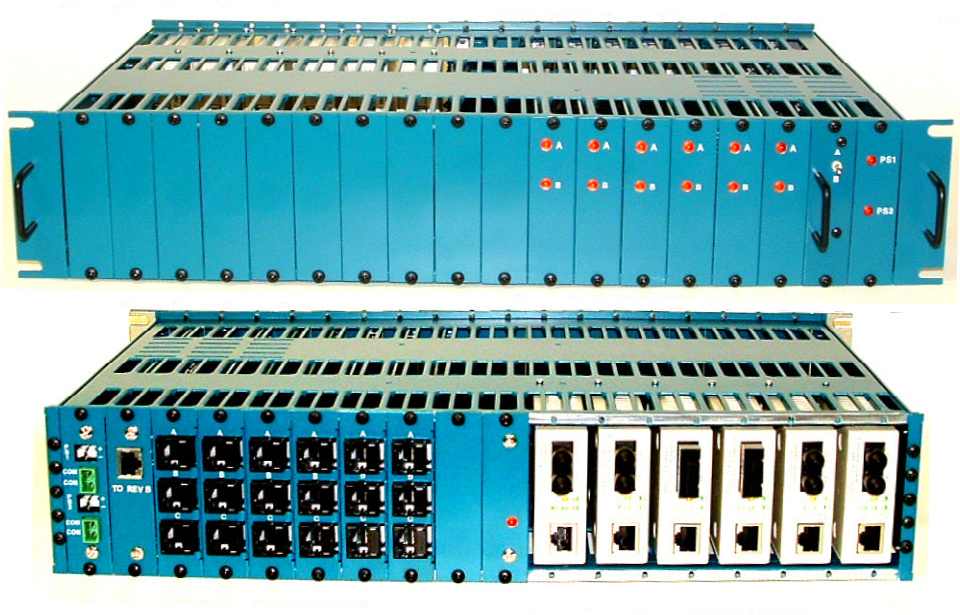

(front & rear view of custom R5000)

Introduction:

A turnkey switching system solution has been developed that uses a NIAP validated SecureSwitch® Fiber Optic A/B/C Switch Revision B switch and a custom R5000 SwitchMaster® Gang Switching System to enable or disable network access of up to six individual CAT6 ethernet connections. This solution automatically provides an air-gapped disconnect that isolates the CAT6 network connections whenever a crypto key is being transmitted over the secure IP network through the SecureSwitch Rev B switch.

The SecureSwitch® Fiber Optic A/B/C Switch Revision B is a duplex, multimode fiber optic 3 to 1 switch that connects any one of up to three different networks to a common device, and provides strong isolation between all of the unselected connections. It has been NIAP validated at EAL 4 Augmented for use in switching between network connections of different security classifications. When necessary, fiber optic media converters can be used to provide the conversion between the customer's UTP copper network cabling and the fiber optic cabling required to connect to the SecureSwitch. For additional details regarding the SecureSwitch product, please refer to the user manual supplied with the SecureSwitch.

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The R5000 SwitchMaster® Ganged Switching System is a 2U high, 19 inch wide, blade based rackmount switch chassis. For this application, four ST and two SC Fiber Optic Media converters have been installed in the R5000 chassis, along with six custom Category 6 Non-Latching A/B Switch cards capable of supporting up to 10 GbE data rates. The FOMs connnect to the SecureSwitch and convert 10/100Base-TX twisted pair Ethernet to 100Base-FX fiber optic Ethernet. The six CAT6 switch cards are controlled as a single group by a system toggle switch mounted on the front panel of a custom controller card installed in the R5000 chassis. This toggle switch also simultaneously controls the connection state of the SecureSwitches, via a control cable from the RJ45 connector on the rear of the controller card to the 6 pin pluggable Phoenix connector for the remote control input port on the SecureSwitch.

Installation:

All of the FOMs, CAT6 switch cards, power supply cards and controller card have been pre-installed in the R5000 chassis. Side extension brackets are included to allow the R5000 chassis to be supported from both the front and rear of the equipment rack if desired. These brackets are packaged separately and need to be installed. The SecureSwitch is also packaged separately, and needs to be connected to the controller card and FOMs in the R5000 chassis.

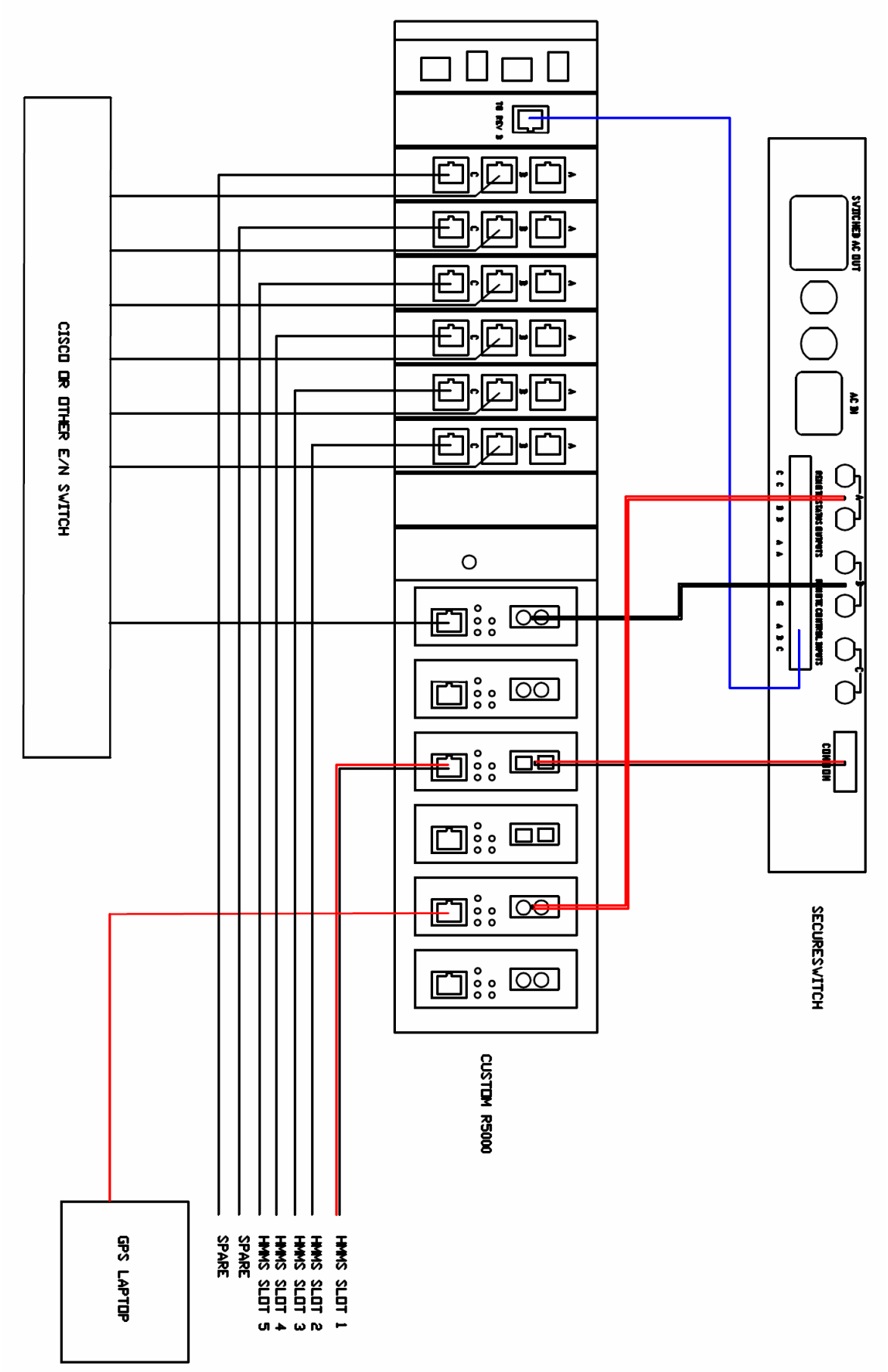
1. Remove the four rear-most screws from each side panel of the R5000 chassis and use these to attach the side extension brackets. The side extension brackets can be mounted in three different positions to accommodate different depths of equipment racks. Locktite has been provided to help secure the four mounting screws in the selected positions.
2. Install the R5000 SwitchMaster in a 19" equipment rack or similar equipment enclosure. Install the SecureSwitch directly above the R5000 chassis. Large cable ties have been included to allow the SecureSwitch to be tied to the R5000 chassis to provide additional support for the complete system during transportation.
3. Apply a source of AC power to the SecureSwitch and then cause the SecureSwitch to change connection states as required in the SecureSwitch user manual during initial installation of the SecureSwitch. Next select port C by depressing and holding the "C" front panel pushbutton switch and verify that the "C" LED underneath the pushbutton illuminates indicating that port C has been selected. This places the SecureSwitch for this application in an initial connection state that corresponds to both the secure and the non-secure network connections being disabled and isolated.
4. For the remaining steps refer to the attached configuration diagram showing the interconnections between each system component.
5. Using the supplied RJ45-TB1 interface cable, plug the RJ45 connector into the control port on the rear of the controller card in the R5000 chassis, and then plug the six position terminal block into the remote control interface port on the SecureSwitch. For reference, pins 1 & 2 of the RJ45 connector are wired to the “A” input pin on the remote control interface of the SecureSwitch, pins 3 & 6 of the RJ45 connector go to the “B” input pin on the remote control interface of the SecureSwitch, and pins 7 & 8 of the RJ45 connector go to the “G” input pin on the remote control interface of the SecureSwitch.
6. Using the supplied ST-ST patch cables and SC-SC patch cables, connect the SecureSwitch to the FOMs. When connecting the patch cables, make sure that the polarity of the TX and RX connections from/to the FOMs is configured properly to allow the TX of the FOMs attached to the COMMON port on the SecureSwitch to connect to the RX of the selected FOMs on the A & B ports of the Secureswitch, and vice versa.
7. Connect the user supplied laptop with crypto key to the FOMs as shown using RJ45 ethernet cables.
8. Connect the user supplied multiport ethernet switch to the FOMs and to the CAT6 switch cards using RJ45 ethernet cables as shown.
9. Connect the HMMS ports to the CAT6 switch cards using RJ45 ethernet cables as shown.
10. Set the front panel master toggle switch on the R5000 to select the desired initial connection state “A” or “B”.
11. Connect the supplied power supply modules to the DC input connectors on the R5000 power supply card. Provide 100-240 VAC power to the power supply modules and to the SecureSwitch.
12. As soon as power is applied, the CAT6 switch cards and the SecureSwitch should switch to the connection state selected by the master toggle switch on the front of the R5000 controller card. The LEDs on the front of the CAT6 switch cards and on the front of the SecureSwitch should all show the same connection state – either “A” or “B” as selected by the toggle switch. Note that the front panel pushbutton switches on the Secureswitch are locked out by the control signals on the remote control input port in this configuration.
13. Installation is now complete and the system is ready for operation.

Operation:

The toggle switch on the front of the R5000 functions as the "master" connection control. It is used to simultaneously control the connection state of the CAT 6 A/B switch cards installed in the R5000 chassis, as well as the SecureSwitch via the RJ45 to 6 pin Phoenix connector cable.

To operate the system the user simply sets the master toggle switch to either the “A” or the “B” position. When the master toggle switch is set to the “A” position, the CAT6 switch cards are set to the “A” connection state which disconnects HMMS slots 2 thru 5 and the two spare network circuits from the Ethernet switch. This also causes the SecureSwitch to be set to the “A” connection state, which connects the two ports on the GPS laptop thru the FOMs and SecureSwitches to the HMMS Maint port and HMMS slot 1 circuits. The “A” LEDs on all of the CAT6 switch card and the “A” LEDs on both SecureSwitches should be illuminated to indicate that all system components are in the selected connection state.

Setting the master toggle switch to the “B” position isolates the port on the GPS laptop and connects the HMMS slot 1 circuit thru the FOMs and SecureSwitch to the Ethernet switch. The CAT6 switch cards are also set to the “B” connection state which connects HMMS slots 2 thru 5 and the two spare network circuits to the Ethernet switch. The “B” LEDs on all of the CAT6 switch cards and the “B” LED on the SecureSwitch should be illuminated to indicate that all system components are in the selected connection state.


CISCO OR OTHER E/N SWITCH
GPS LAPTOP
SPARE
SPARE
HMMS SLOT 5
HMMS SLOT 4
HMMS SLOT 3
HMMS SLOT 2
HMMS SLOT 1
CUSTOM R5000
SECURESWITCH
SWITCHED AC OUT
AC IN
COMMON