RADIUS CLIENT INTERFACE MODULE

For OmniOn Power Galaxy Millennium II Controllers (J85501P1 and J85501P5)

Figure 1: 1600482623A RADIUS Client Module

This Quick Start Guide provides installation information for the RADIUS Client (RC) product option that can be added to an existing J85501P1 Galaxy Millennium 2 Controller to allow it to participate in a company's RADIUS Authentication process. The new device is a RADIUS Client module which will be used by the OmniOn Power Galaxy controller to obtain defined system user credentials to allow access to the power system controller over the network. This new RADIUS Client will connect to the RADIUS Server over the network and authenticate whether a specific user can access the OmniOn Power controller. The permission results will be shared with the OmniOn Power controller so that the user desiring connection will be managed appropriately.

There are two basic configurations of the J85501P1 Galaxy Millennium 2 Controller. The J85501P1L1 is the larger chassis version of the Millennium 2 typically mounted to the Galaxy Power System(GPS) cabinet door. This larger size unit has accommodations for an optional card to be mounted internally in the controller. The J85501P1L5 controller is the same controller but mounted in a smaller chassis that does not account for a space for mounting and internal option card. This controller is typically found on smaller power systems like the Infinity M Power System. The RADIUS Client module mounts onto the door when operating with a Millennium 2 in an Infinity M system. Both the J85501P1L1 and J85501P1L5 Galaxy Millennium 2 controller will utilize the same RADIUS Client module and basic connections and configuration. The key difference is the location of where the RADIUS Client module is mounted.

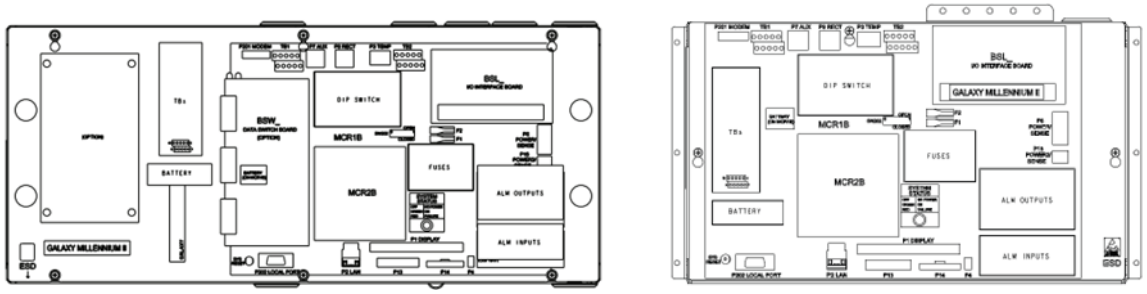

Figure 2: J85501P1L1 And J85501P1L5 Galaxy Millennium 2 Controllers

This documents uses J85501P1L1 for most of the details described. However, the instructions are applicable to the J85501P1L1 description with the difference being in the mounting locations of the unit.

Document: 8600482587P

Tools Required:

- Calibrated torque wrench (0-10 in-lbs.)
- Wire cutters and strippers
- Screwdriver (#1 Phillips)
- 552714-1 Barrel connector push on tool
- Screwdriver (#1 Flat)

Kit Required:

The following are the items in the 1600482562A RADIUS Client Kit.

No.	Ordering code	Name	Quantity
	1600482562A	GCS5_RADIUS KIT	
1	4600229977P	CAP BOARD IN TERMINAL 18-20 AWG	4
2	4600481536P	COUPLER MODULAR JACK RJ45 8P8C CAT5E UNSHIELDED	1
3	1600482623A	GCS5 RADIUS BOX	1
4	8600482600P	GCS5 RADIUS NETWORK CABLE	2
5	900633504	NUT HEX LOCK #6-32 STEEL ZINC-CLEAR (USE ON J85501P1L5 ONLY)	2
6	8600483463P	RADIUS CLIENT LABEL (USE ON J85501P1L1 ONLY)	1
7	8600482587P	RADIUS CLIENT QUICK START GUIDE	1
8	846812253	SCREW MCH #6-32 PAN PHL EXT LCK STEEL ZINC-CLEAR	4
9	450048379	TB 1850660 FRONT-MC 1,5/2-ST-3,81 PLUGGABLE 8A 300V 2-POS	1
10	4600483455P	UL1569 24AWG SOLID BLACK 105C 300V VW-1	2
11	4600483456P	UL1569 24AWG SOLID RED 105C 300V VW-1	2

Figure 3: RADIUS Client Kit

Network Information Required:

The following are the network parameters required from the customer's administrator or appropriate person to complete the configuration of the Millennium 2 and RADIUS Client.

Millennium 2: Static IP Address, Network Mask, RADIUS Client IP Address

RADIUS Client: RADIUS Client IP Address, Network Mask, RADIUS Server IP Address, RADIUS Server Communication Port Number, and RADIUS Server Secret.

****Note:** Two distinct Static IP Addresses are required: One for the Millennium 2 and one for the RADIUS Client. They cannot share the same IP address.

Step 1 – Remove Cover On The Millennium 2 Controller

Carefully remove the Galaxy M2 Controller cover by loosening the (6) screws and washers that hold it on the chassis.

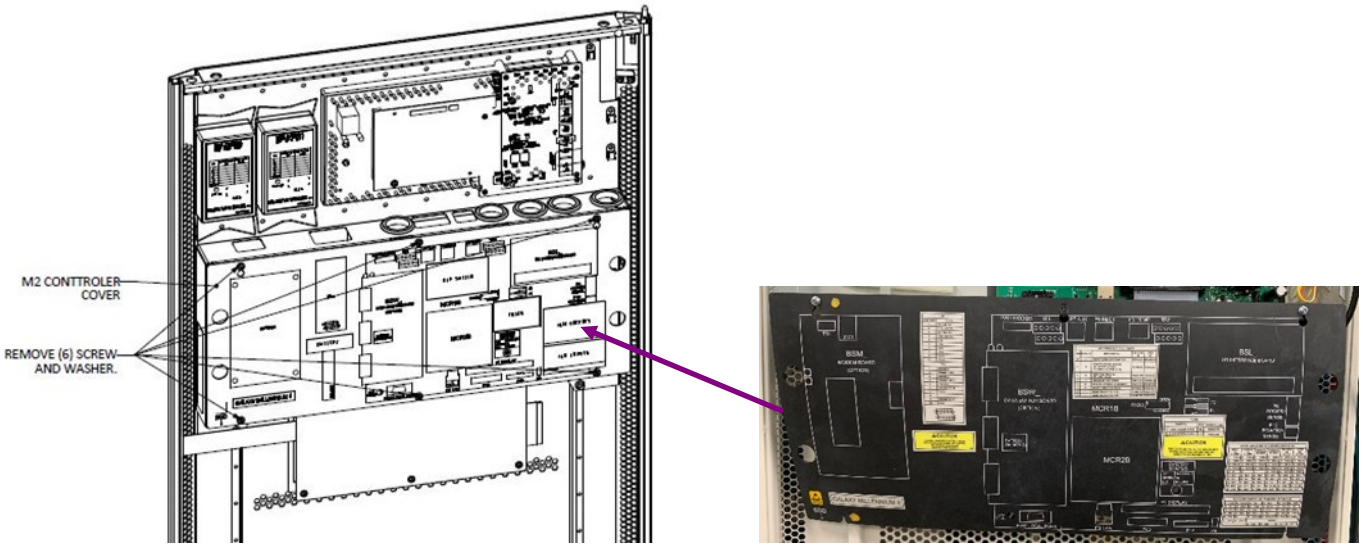

Figure 4: J85501P1L1 Galaxy Millennium 2 Lexan Cover

Step 2 – Install The RADIUS Client Into The Millennium 2 Option Space

J85501P1L1 Millennium 2

1. If the Millennium 2 controller is installed and powered in the field, follow all standard and appropriate installation protocols for working with the controller in a live power system. This can include the added step of covering the exposed BSL alarm pins with non-conductive material for additional safety or working in the maintenance window, if deemed necessary.
2. Locate the four chassis standoffs located on the left side of the controller utilized for the addition of an option card/module to the controller. Position the chassis of the RADIUS Client module such that Input Power (Terminal Block) is facing in the upwards direction and towards the top of the controller chassis. Align the four mounting holes of RADIUS Client Module to the standoffs and secure the chassis in place with the (4) 846812253 6-32 screws. Torque to 10 IN-LBS.

3. Obtain the two-position Terminal Block 1850660 mate from the kit.

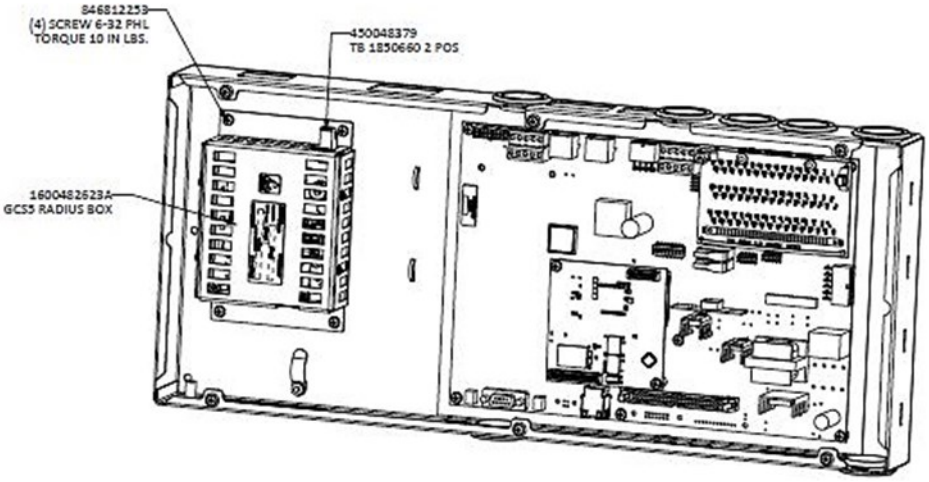

Figure 5: RADIUS Client Installed In J85501P1L1 Millennium 2 Controller Chassis

For J85501P1L5 Millennium 2

Installation of the RADIUS Client kit for a J85501P1L5 Millennium 2 follows the similar steps previously described except now the unit needs to be oriented and located onto the Infinity M System cabinet door. See figure 6.

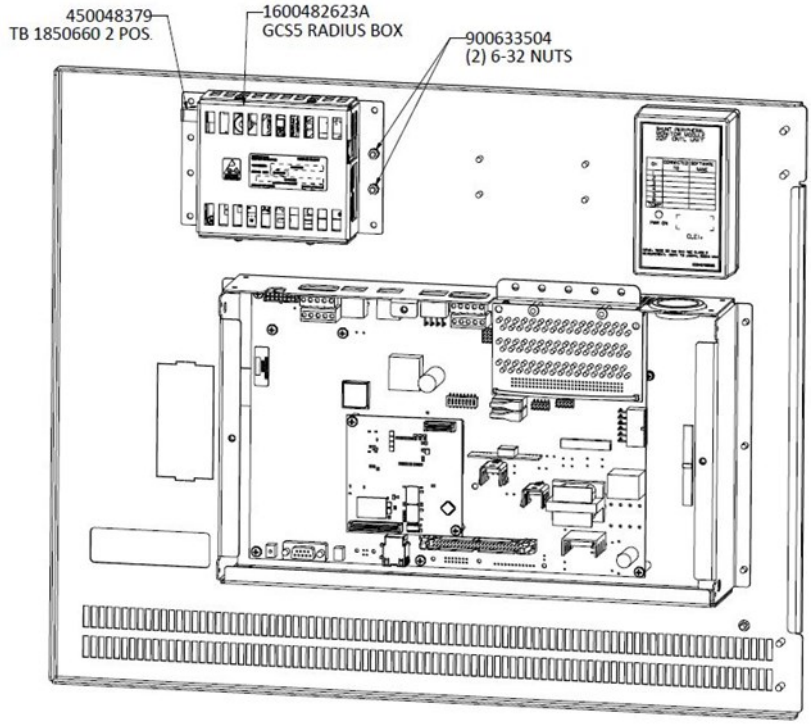

Figure 6: RADIUS Client Installed With J85501P1L5 Millennium 2 Controller In Infinity M

Step 3 – Connecting Power And Network Cables To RADIUS Client Module

J85501P1L1 Millennium 2

1. The input power for the RADIUS Client module is brought into the module through the 2-position terminal block connection. Power can be conveniently obtained by connecting to the available BSL interface ABS (Alarm Battery Supply) outputs on the Millennium 2. Most Millenium 2 configurations utilize the BSL3 with its insulation displacement punch-down interface. There are some controllers that utilize the BSL4 which is a wire wrap equivalent of the interface. This document describes installation with Millennium 2 controllers with the BSL3. Installation instructions are similar for those controllers with the BSL4 except a wire wrap tool is required to make the connections at the alarm interface instead of a punch-down tool.

   ABS power connections are protected by a 1.3A GMT fuse (Ref F2). ABS power is available from either punch-down position 93 or 94. The polarity of ABS is -48V (48V DC-, Hot). The return for this power input will be Discharge Ground (DG / 48V DC +/ Return) also located on BSL punch-down at pins 95 and 96.

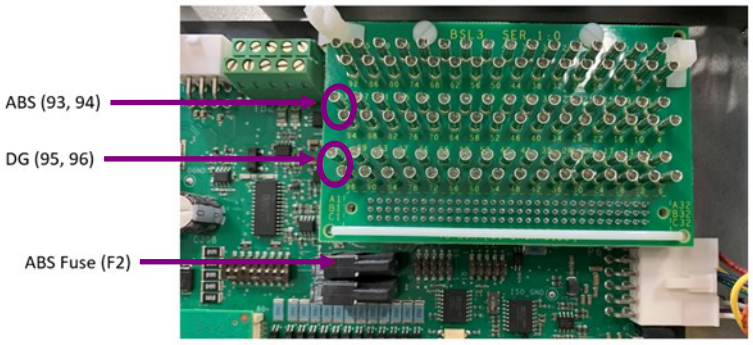

Figure 7: Millennium 2 BSL3 Alarm Punch-Down (ABS,DG) And ABS Fuse

a. Select which ABS power signal punch-down, receptacle 93 or 94, will be used on the BSL board.

   i. Verify that there are no wires on 93, 94, 95, or 96 that are powering existing equipment. If yes, investigate and determine if equipment can be powered down.

b. Locate the ABS Power GMT Fuse (FH2) and carefully remove the fuse from the holder. This removes power from the ABS connection. Note: a convenient fuse puller (407459148) should be available. In the J85501L1 Millennium 2, the tool may be located as shown.

Figure 8: GMT Fuse Puller

c. Use the provided 24 AWG Red wire and carefully punch the wire down into the selected ABS position, 93 or 94. The Red wire will be utilized for the -48V (48V DC-, Hot) in this installation.

   Note: this installation method starts with the power connections to the BSL side first, routes the wires, and finishes at the RADIUS Client Input Power Terminal Block. The installer may choose to attach the power wire connections to the RADIUS Client input terminal block first, route them, and finish at the BSL3 interface. For either case, please read the instructions and adjust accordingly.

d. Carefully dress the cable at the top of the Millennium 2 controller internally towards the RADIUS Client input terminal block. Cut the cable to an appropriate length to allow removal and insertion serviceability of the mating terminal block.

e. Remove the Red wire's insulation and secure the ABS -48V (48V DC-, Hot) connection into Terminal block position 2 of the input power terminal block. Position 2 is the position furthest from the side of the module as depicted in Figure 12.

f. Identify and select the DG (48V DC +/ Return) return power signal, position 95 or 96, that will be used for the RADIUS Client input.

g. Use the provided 24 AWG Black wire and carefully punch down onto the selected DG (48V DC +/ Return) receptacle, position 95 or 96.

h. Carefully dress the cable at the top of the Millennium 2 controller along the side of the Red ABS -48V (48V DC-, Hot) cable to the input terminal block. Cut the cable to an appropriate length to allow removal and insertion serviceability of the mating terminal block.

i. Remove the black wired insulation and secure the DG (+48V/ 48V DC + , Return) connection into terminal block position 1 of the input power terminal block. Position 1 is the position closest to the side of the module as depicted in Figure 12.

j. Once both power wires are connected insert the terminal block mate back into the RADIUS Client.

k. Place one of the yellow punch-down terminal caps, 4600229977P, onto each of the power connections that were made on the BSL3 for the RADIUS Client.

l. Return the Millennium 2 ABS GMT Fuse (FH2) back into the holder. The RADIUS Client should now be receiving power and should be on. The unit should have its status LED illuminated red.

For J85501P1L5 Millennium 2

Installation of the RADIUS Client power connections with the J85501P1L5 Millennium 2 follows the same steps previously described except now the power cables must route from the BSL3 punch downs and neatly dress from out of the top of the Millennium 2 chassis (due to controller's orientation on the Infinity M door) to the left side of the externally mounted RADIUS Client module.

J85501P1L1 Millennium 2 (Continued)

2. The RADIUS Client must now be physically connected to the Millennium 2. The Millennium 2 software must be upgraded to account for the RADIUS Client. In addition, a couple of basic configurations are required.

   a. Physical Connection

      Connect the network cable 8600482600P provided from the RJ45 port labeled CONTROLLER of RADIUS Client to the RJ45 port P2 LAN of the Millennium 2 controller as shown in Figure 12. This Millennium 2 cable to RADIUS Client connection can dress outside of its chassis. If the Millennium 2 controller is already connected to the site's internal network, remove the cable connection. The cable will be used in the next step.

   b. Software Upgrade And Configuration

      The Millennium 2 requires a small software enhancement to account for its interconnection with the RADIUS Client. It is necessary to access the Millennium 2 through its ethernet port to perform the upgrade. Access can be achieved by having your laptop on the same network that the Millennium 2 resides, by configuring your laptop to be an IP address on the same network that the Millennium is configured and directly plugging into the controller's ethernet connection, or by disconnecting the controller's ethernet connection and reconfiguring its port to be in Server mode and directly accessing the controller. Utilize the best available method. Contact 24/7 technical support to obtain the latest software or if there are any questions in this process.

   c. Once connected, backup the Millennium 2 configuration by going to the Software tab and using the "Save Config" command. This file should be named and stored in case it is needed for a restore. It is not anticipated to be used in normal installations.

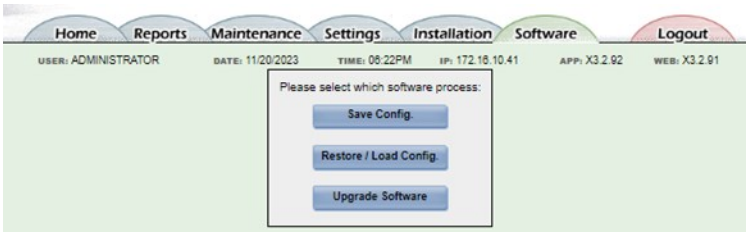

Figure 9: Configuration Backup

   d. Load software 3.2.92 web and application or later into the Millennium 2. Once the software is loaded verify the code has been updated by looking at the screen like that below. Refresh the screen if necessary (CTRL F5). Contact 24/7 technical support to obtain the latest software or if there are any questions in this process.

Figure 10: Software Versions In Web

   e. Once the new software is loaded into the Millennium 2, the RADIUS Client IP Address must be set, and the password must be configured to be of the "Username and Password" format.

      Go to Settings > Communication and click on "Network"-. Enter the RADIUS Client IP Address provided into the field shown and save.

      Note: The Millennium controller must be in "Static" network mode of operation and connected to the customer network to complete this step.

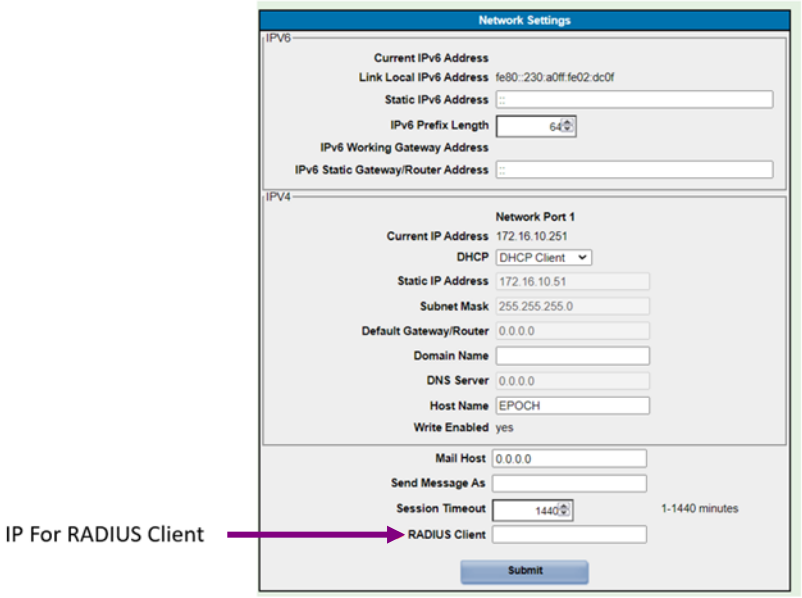

Figure 11: Configure RADIUS Client IP In Millennium 2

Go to Settings > Communication and click on “Passwords”-. Select the “User Name and Password” Login Method and save.

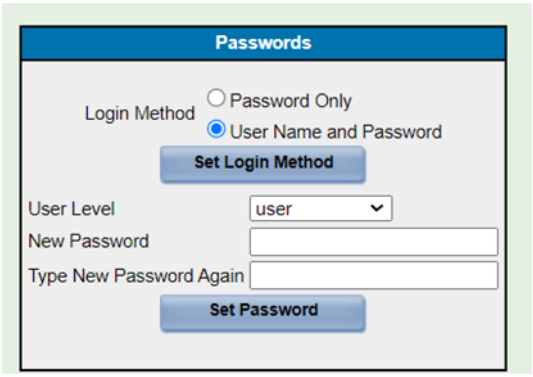

Figure 12: User Name And Password Login Method

For J85501P1L5 Millennium 2 (Continued)

Installation of the RADIUS Client data connection to the J85501P1L5 Millennium 2 follows the same steps previously described except now the controller to RADIUS Client communication cable must route from the respective RJ45 LAN connection now located at the top of the Millennium 2 chassis (due to controller’s orientation on the Infinity M door) to the right side of the externally mounted RADIUS Client module. The same port connections are made as well as the same Millennium software upgrade and configuration are required.

J85501P1L1 Millennium 2 (Continued)

Once the Millennium 2 connections and configuration are complete, the RADIUS Client requires physical connection to the sites' network and configuration of specific parameters for the RADIUS Server connectivity.

a. Physical Connection

If a site network connection was removed from the Millenium 2 controller in step 2 check to see if the cable is long enough to extend back into Millennium 2 and connect directly to the RJ45 LAN port on the RADIUS Client as shown in Figure 12. If it is, feel free to use this cable connection and bypass the use of the second network cable 8600482600P. If the cable is not long enough or does not exist, connect the second network cable 8600482600P to the RJ45 port marked LAN on the RADIUS Client and bring it out of the chassis as shown in Figure 12. The supplied 4600481536P coupler can be used to join a previous network cable if it was too short. If a new cable connection is available then the second 8600482600P can also be bypassed.

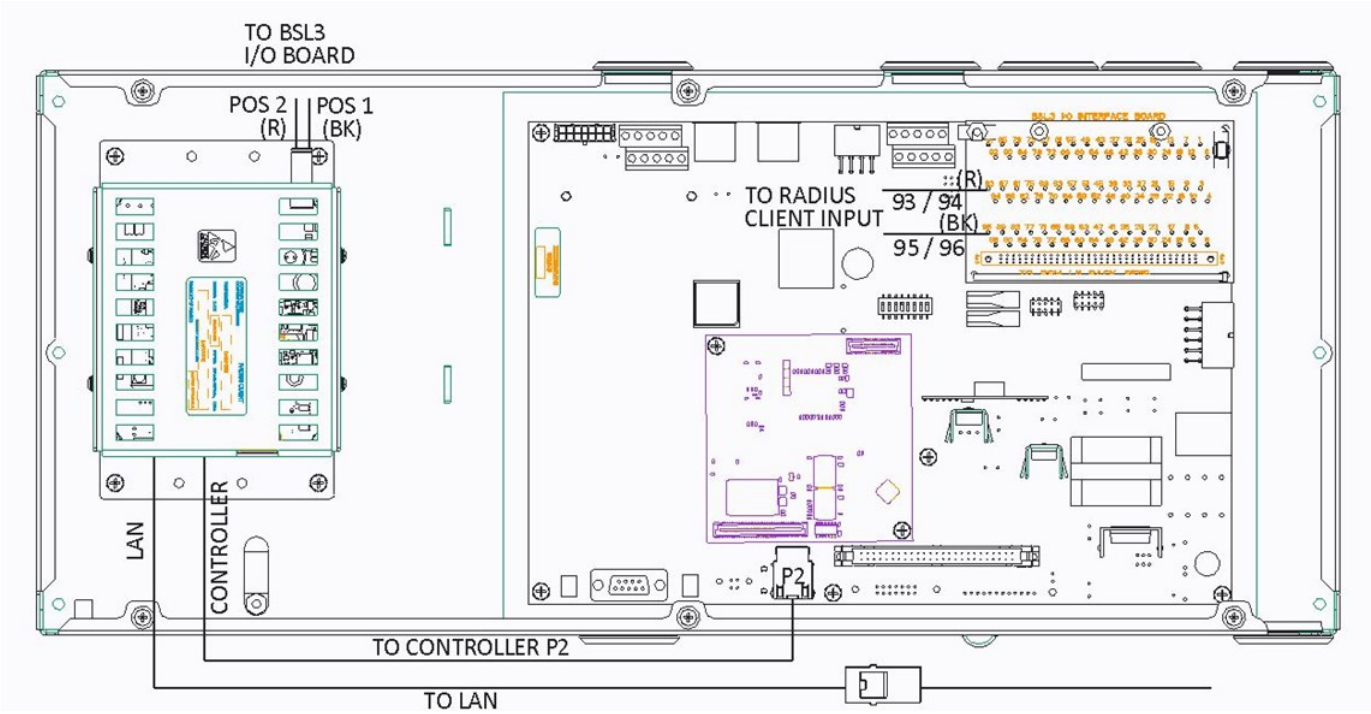

Figure 13: RADIUS Client Network Cable Connections In J85501P1L1

b. Software Configuration – Local Port

The RADIUS Client requires configuration for its specific IP address as well as the RADIUS Server. This configuration can be achieved by connecting a laptop directly to the Craft port of the RADIUS Client and using a standard web browser to access the configuration page supported by the RADIUS Client. The RADIUS Client can also be accessed over the network with appropriate login credentials. The screens presented are very similar. Connecting directly to the Craft port is described in this document.

To access the RADIUS Client configuration page, enter **192.168.1.1** into the web browser's address bar. A screen like that following will appear. No login credentials are required at the Craft port. Note: a user can check to see if their login can be authenticated by entering their name and password and clicking the "authenticate" button.

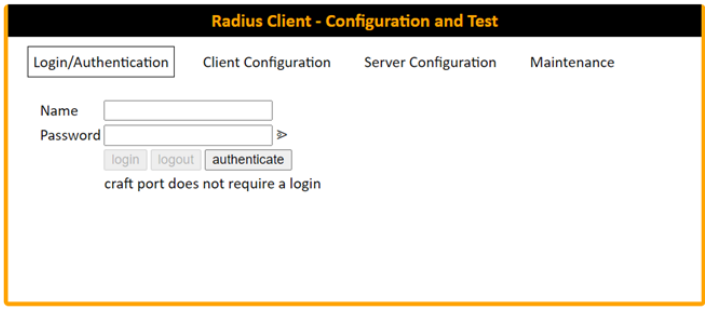

Figure 14: RADIUS Client Login Page

Once logged in, a user can access the screens located under the Client Configuration, Server Configuration, and Maintenance tabs.

RADIUS Client Configuration

Fill out the RADIUS Client's Static IP Address, Network Mask, and Gateway using customer supplied values in the "Client Configuration" tab like the example below. Use the "Submit" button to save the configuration. If necessary, the "reset" button can be used to clear or reset the IP addresses. Note: if this is performed remotely, communication will be dropped and remote login terminated such that local configuration is required.

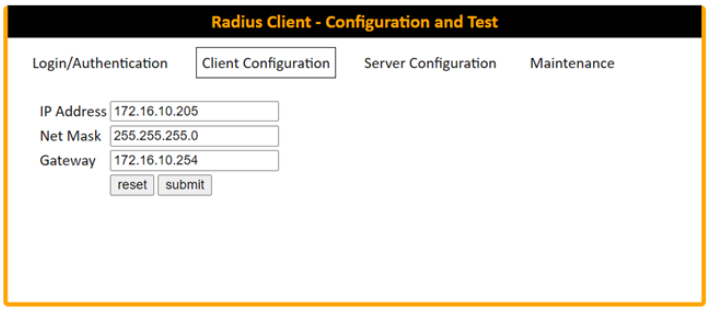

Figure 15: RADIUS Client Login Screen Over Network

RADIUS Server Configuration

Fill out the RADIUS Server information located in the "Server Configuration tab. Use customer supplied values for its Static IP Address location, Port (UDP port typically 1812 but can be 1645), and Secret (shared secret key) located in the "Client Configuration" tab like the example below. Use the "Submit" button to save the configuration. The RADIUS Client supports up to two RADIUS Server locations. Only one RADIUS Server location is required. If necessary, the "reset" button can be used to clear or reset the information. Note: if this reset is performed remotely, communication will be dropped, and remote login terminated such that local configuration is required.

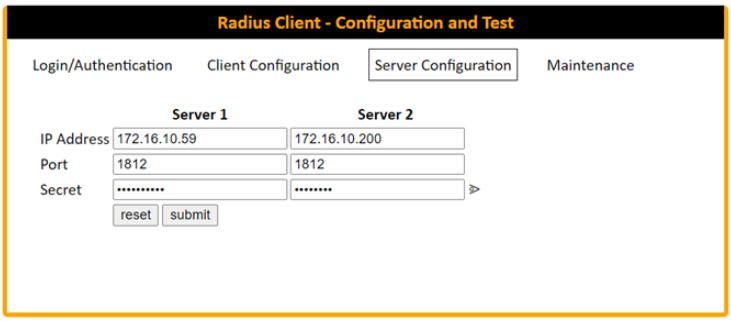

Figure 16: RADIUS Server Configuration

RADIUS Client Maintenance

The RADIUS Client supports a few basic maintenance features which are in its “Maintenance” tab as shown in the following sample screen. These features include the ability to set the date and time, obtaining various information through “About” and the ability to upgrade the RADIUS Client Software. Setting the date and time is generally the item that is performed.

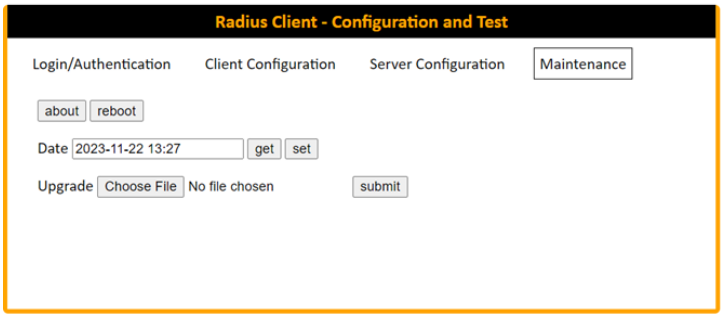

Figure 17: RADIUS Client Maintenance Screen

To set the date time, first use the “get” function to retrieve the present date and time that is set in the RADIUS Client. If necessary, change the date and/or time to the desired value. Use the “set” function to save the changes.

The RADIUS Client Software version, date installed, and MAC address can be obtained by using the “About” tab. A sample screen follows.

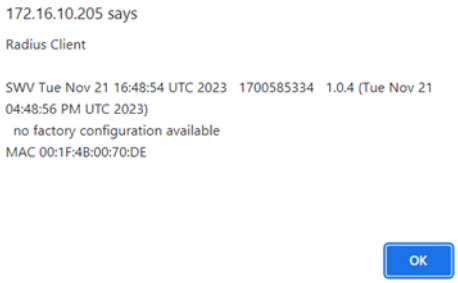

Figure 18: Sample RADIUS Client About Screen

For J85501P1L5 Millennium 2 (Continued)

Installation of the RADIUS Client data physical connection to the sites’ network and configuration of specific parameters for the RADIUS Server connectivity to the J85501P1L5 Millennium 2 follows the same steps previously described except now the network connection to the RADIUS Client module routes directly from the module to the site’s LAN connection. It does not pass through Millennium 2 as shown in Figure 14. The same IP port configuration is performed as previously described.

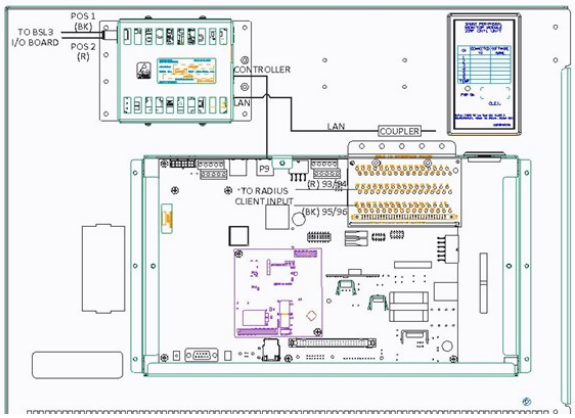

Figure 19: RADIUS Client Network Cable Connections With J85501P1L5

Step 4 – Return The Millennium 2 Cover

Once installation and configuration of the RADIUS Client and Millennium 2 controller have been completed, disconnect RADIUS Client Craft port connection, and return the Lexan cover back to the controller using the (6) screws and washers removed from Step 1.1.

A supplemental label, 8600482685P, identifying the new RADIUS Client option has been installed in the Millennium 2 and is included in the kit. Place this J85501P1LRC label on the J85501P1L1 Lexan cover as shown. This label is not used on the J85501P1L5 cover.

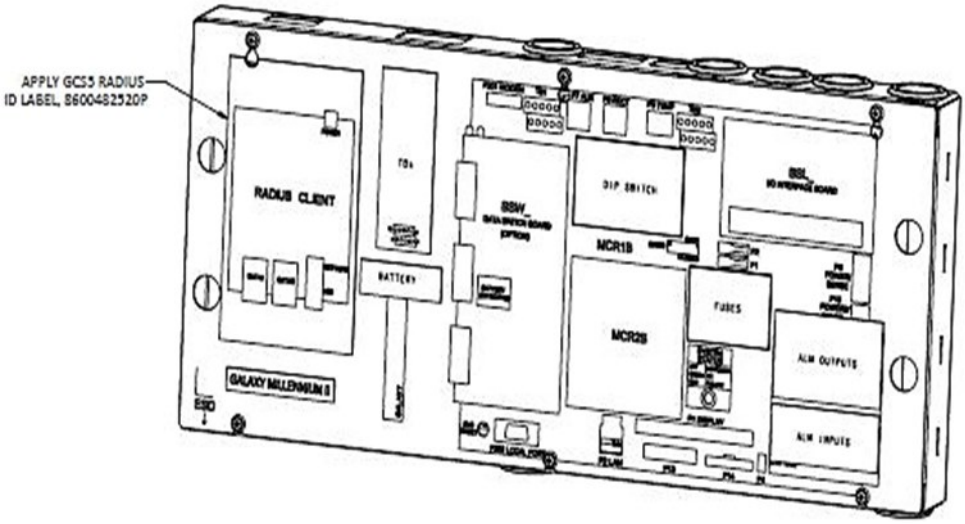

Figure 20: Millennium 2 Lexan Cover With RADIUS Client Identifier Label

Specifications and Application

1. Specifications and ordering information are available at https://www.omnionpower.com/.
2. Equipment and subassembly ports:
    a. Are suitable for connection to intra-building or unexposed wiring or cabling.
    b. Can be connected to shielded intra-building cabling grounded at both ends.
3. Grounding / Bonding Network – Connect to an Isolated Ground Plane (Isolated Bonding Network) or an Integrated Ground Plane (Mesh-Bonding Network or Common Bonding Network).
4. Installation Environment - Install in Network Telecommunication Facilities, OSP, or where NEC applies.
5. Return may be either Isolated DC return (DC-I) or Common DC return (DC-C).

Change History (excludes grammar & clarifications)

Revision	Date	Description
1.0	10/27/23	Initial Release
2.0	11/21/23	Changed input wires, added new configuration screens and process, clarified installation details for wiring, added additional details.
2.1	04/03/2024	Updated as per OmniOn template

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