GCS Satellite

Installation Manual

Version 1.3

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Revision History

1.0 First Release 06/29/2000
1.1 Release 08/18/2000 – Updated diagrams, backplane references
1.2 Release 08/29/2000 – New I/O diagrams, Lantronix-to-PC diagrams
1.3 Release 11/22/2000 – Added Lantronix Configuration section

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Table of Contents

Introduction

Overview

Satellite is an easy to install, easy to use, high performance access control and security management system. Designed for use in a wide variety of security applications, the **Satellite** system allows users to monitor and control many facility control and security functions. The Microsoft Windows® based software and graphical user interface facilitate its use by individuals of all skill levels. Microsoft Windows® was chosen because of its graphical user interface (GUI), ease of use and wide acceptance. The GUI is consistent throughout most Windows-based programs. Once familiar with the basic Windows concepts, most applications or programs are easily learned.

The **Satellite** system provides integrated access control and many security management functions. With the software and hardware that make up the **Satellite**, a user can control a complete facility or multiple facilities. The **Satellite** system was designed to combine Access Control, Alarm Monitoring, Photo Imaging/Badging, Photo Verification, HVAC and Lighting within a facility.

The **Satellite** system consists of both electronic hardware and software components that work together to control and monitor a facility. The software components are used to configure and monitor the operation of the hardware while the hardware components implement the actual security and control functions.

This manual is written around the features of the **Satellite** software and the Satellite Controller. Both of these are required to take advantage of all the features discussed in this guide. Please contact Galaxy Control System's Technical Support with any questions.

The Satellite Hardware

The **Satellite** system hardware consists of four major components: the **Satellite** Control Units, Card Readers, Input/Output Ports, and the Personal Computer.

Satellite Controllers

This is the heart and brains of the hardware. All system functions, such as cards being granted access and alarm devices monitoring the system, are controlled by this unit. In addition, all system events, such as card reads and alarm events, are recorded by the Satellite control units.

Card Readers/Keypads

The **GCS Satellite** system supports most of the industry's major card readers and technologies. The supported technologies and readers include but are not limited to:

- Galaxy Control System's infrared swipe readers, keypads, and card reader keypad combinations.
- Wiegand format readers including Proximity, Wiegand swipe, Wiegand key, keypads, and most biometric technologies.
- ABA format readers including magnetic stripe readers, barcode readers and keypads.

  Additionally, the Parallel reader module allows a pair of readers to be connected to the same controller port. This allows both entry and exit door control through the use of a single port.

  Galaxy is continually expanding its range of supported readers. If you have a particular installation requirement, please contact Galaxy Control System for assistance.

The Input/Output Port (I/O)

This type of port allows up to four alarm devices to be monitored and provides two form C relay outputs and 2 open collector outputs. The open-collector outputs are suitable for driving low-current circuits such as LEDs or low-current relay coils. The output is pulled low by the controller when the output is on (current flowing). External components must complete the circuit by providing an electrical pull-up to positive voltage. See the Input/Output section for more detail.

The Computer System

Minimum Requirements for PC Configuration

- IBM Compatible PC with an Intel® Celeron ® 500 MHz processor (or higher)
- 64 Mb of RAM
- Windows 95®, 98®, or Windows NT® Workstation 4.0 with Service Pack 5
- Microsoft® Internet Explorer version 4.0 or higher (cannot be replaced by Netscape® Navigator)

- 2 GB of free hard drive space to install Satellite; more space needed depending on size of database.
- Standard graphics card capable of 24-bit color at 1024 x 768 resolution
- 17” monitor (or larger)
- Standard Parallel Port
- COM (serial) ports as required:
    - One COM port per loop
    - An additional COM port if using an RS-232 programming reader
- One COM port if using a serial Port UPS
- One serial Port UPS (recommended)
- Any Windows® compatible printer for report printing

The above specifications are minimum requirements only and are subject to change with the addition of software modules. Please contact Galaxy Control System to ensure these are the latest specifications.

NOTE: ANY deviation from these minimum requirements can cause **Satellite** to not function, or to operate with degraded performance.

Simple System Configuration

The basic system configuration would be one controller and one card reader. The card reader and door controls would, of course, be located at the point of entry. Cabling between the card reader and the controller allows data to be sent to the controller and status information to be sent back to the reader indicator lights. Additional cabling allows for the control of a door release and a sensor signal to be sent to the controller when the door is opened. A manual access switch can be added to the system so that personnel without cards may be visually recognized and the door opened for them. The processor board provides the surge protection necessary to protect the CPU in the event that the reader receives a surge.

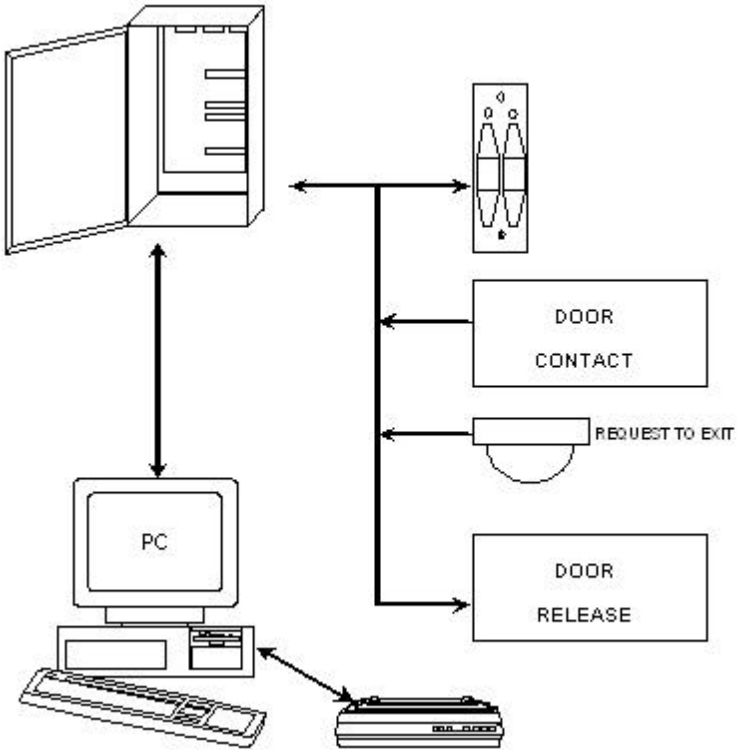


Figure 1

Most installations will consist of at least two entry points controlled by one primary controller. For systems with more than two points of entry, multiple controllers are connected in a loop configuration with one controller acting as the primary unit and the others as

secondary units. In a loop of this type, all controllers work in a similar fashion to make access decisions, but only the primary controller is connected to a PC. This means that regardless of the size of the network, only one connection is needed for system programming or for logging activity. Such a design allows for the installation of a large enough system to accommodate up to 256 points of entry and also provides the capability for upgrading or expanding at any time

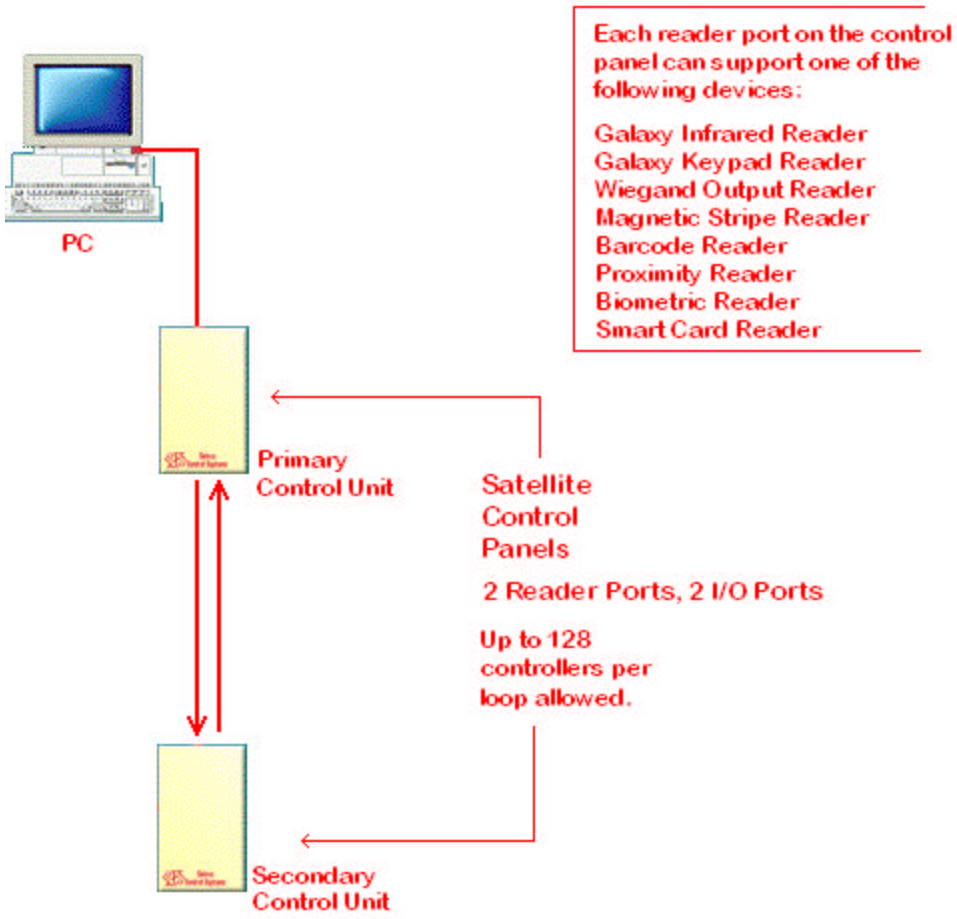


Figure 2

An expanded configuration of the system would consist of several Satellite controllers, each controlling up to two points of entry as shown. Only one personal computer is required to program the system regardless of the number of controllers in a system.

Controller Installation

Site Plan

The first step to a successful installation is to make a site plan. This is a drawing indicating the location of each component of the access system. It should include the controllers, power supplies, PC, card readers and/or keypads, door contacts, door strike sensors, all alarm points and all wiring lengths. Have the customer provide blueprints of the building or buildings to assist you with this task. It is very helpful to have access to the electrical drawings as well. **Always remember to have your site plans approved by the local regulatory agency to assure that your installation will conform to all safety codes.** When drawing any site plan, keep the following items in mind:

1. Keep all wire (power, network, strike, door sensor, alarm and reader) well away from high frequency and high power lines. If the crossing of these lines is unavoidable, do so at a 90-degree angle. This minimizes the electrical interference, which could disrupt the system's normal operation.

2. Use 22 AWG (Beldon #9946) shielded wire for readers; 22 AWG shielded twisted pair for controller to controller (loop) wiring (Beldon #8723); and 18 AWG shielded wire for door release connections. All system wiring should be in dedicated conduit, with the shields grounded at the controller end only.

3. The controller should be centrally located in reference to the doors and/or alarm points that it controls. This will prevent many long wire runs. It should also be located in a secure area to prevent tampering.

4. If the distance between networked controllers exceeds 1000 feet (at 9600 baud), line drivers or short haul modems are required.

Installation Procedure

1. Mount chassis.
2. Wire network (J17).
3. Wire power supply (J17). **DON'T PLUG IN AC AT THIS TIME.**
4. Set Options, Unit No., and Baud Rate Switches on the CPU Board.
5. Connect the personal computer and modem if necessary.
6. Connect AC Power and make sure the three LEDs are illuminated.
7. Put Option Switch One in the down position.

The Satellite Controller

Specifications

Controller Enclosure Dimensions: 21.00" x 14.00" x 4.00": The controller enclosure is designed to be wall mounted.

Input Power: 12 VDC @ 2 amps; minimum: 11.5 V, maximum: 14.0 V. This powers all PC boards and readers. **Lock Power must be provided separately**. Most biometric readers must also be separately powered. Be sure to common the grounds between the supplies.

Port Output: Form-C SPDT contacts; 24 VDC @ 1.5 amps maximum. Each port circuit provides relay contacts for controlling external devices.

PC to Controller Communications: Serial Asynchronous RS-232. Interfaces at 2400, 4800 and 9600 baud.

Connections: Straight lead barrier strips. All cable should be shielded and connected to the Power Supply Ground. **DO NOT USE THE CONTROLLER CHASSIS FOR GROUND!**

Connection	Distance	Wire	Beldon #
PC to controller (RS-232):	50 ft.	22 AWG 4 conductor twisted pair	8723
Controller to Modem (RS-232):	50 ft.	22 AWG 4 conductor twisted pair	8723
Controller to Controller at 9600 baud:	1000 ft.	22 AWG 4 conductor twisted pair	8723
Galaxy-provided line drivers can be used to go longer distances			
All Galaxy readers:	2500 ft.	22 AWG 10 conductor	9946
All other readers:	500 ft.	22 AWG 10 conductor	9946
Lock Hardware:		18 AWG 2 conductor minimum	

Mounting the Controller

The controller enclosure is designed to be wall mounted. Its specifications are 21.00” x 14.00” x 4.00”. Four tear-dropped shaped mounting holes are available as shown below. It is not necessary to remove the back plane board to hang the unit. Typically, 1/4” wood screws or anchors with sheet metal screws would be used.

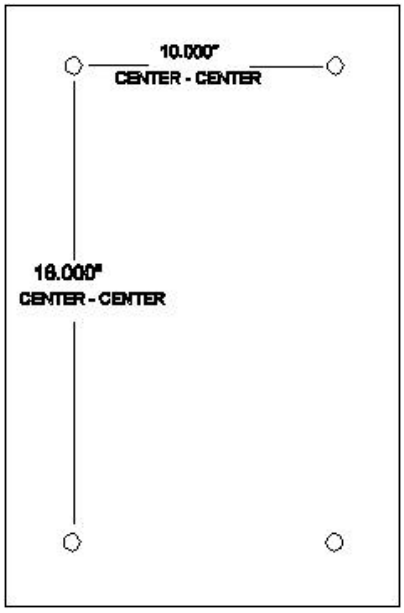


Figure 3

When selecting a mounting location, keep the following points in mind:

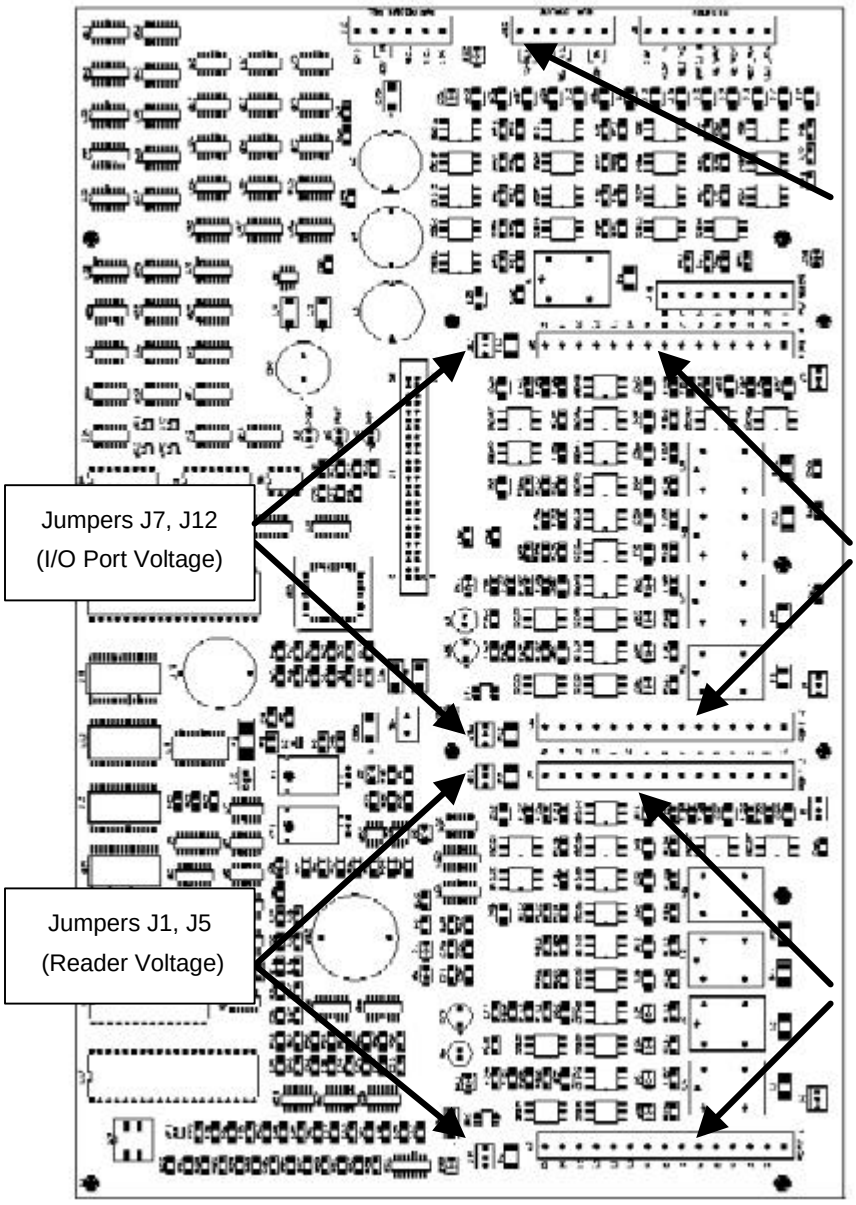
- Clean, reasonably dust-free environment
- Temperature should be between -10° C and +60° C.
- Location should have limited access for security purposes.
- **Do not mount to metal studs. Do not connect Chassis to Cold Water Ground.**
- Avoid power transformers and high frequency devices.

Central Processing Unit

The Central Processing Unit (CPU) is the “Heart and Brains” of the **Satellite** system. It is responsible for all decisions made by the system. Its inputs consist of card/PIN codes, door sensors, manual egresses, alarm conditions, network messages and PC data. Control signals for the door releases, reader LEDs, output relays, network and PC communications make up the CPU’s outputs.

The illustration on the following page is of a **Satellite** CPU.

The CPU includes Option Switches, Unit Number Switches, Baud Switches, a Reset Switch, LEDs, and Batteries. Each of these elements is discussed in the following sections.



Supervision

- Low battery,
- AC Failure,
- Tamper

Dry input normally closed

Optional Input/Output

8 inputs/ 8 outputs

2 Readers

Door contact,
Exit request
inputs

Figure 4

Unit Number Switches (S2)

To the immediate **left** of the eight OPTION switches is a bank of switches labeled UNIT NO. The combination on this bank determines the Unit Identification number of the controller. The local primary controller hooked to the computer is always Unit Number "000." If there are additional controller, each one **MUST** have its own unique ID number. Other controller numbers range from numbers 001 through 127, allowing for systems of up to 128 controllers. There cannot be two controllers on a system with the same Unit Number. It is recommended that secondary units be assigned unit numbers in ascending order starting with Unit '001'. The table on the following page lists the different switch settings for Unit Numbers 000-05. Appendix A lists the switch settings for unit numbers 0 through 99.

0 = Switch Down, OFF
1 = Switch Up, ON

Switch #	1	2	3	4	5	6	7	8
Value	1	2	4	8	16	32	64	128
Unit #								
00	0	0	0	0	0	0	0	0
01	1	0	0	0	0	0	0	0
02	0	1	0	0	0	0	0	0
03	1	1	0	0	0	0	0	0
04	0	0	1	0	0	0	0	0
05	1	0	1	0	0	0	0	0

Option Switches (S3)

The OPTION (S3) switch bank is the second of three sets of dip switches located along the left side of the CPU board. This bank of switches enables certain unique functions for the panel. Below is a description of these switch functions.

Switch 1 – Reset Mode

In the up position, this switch initializes, wipes clean, or "COLD STARTS" the controller memory when the controller is reset.

The controller is shipped with this switch in the up position so that it gets a clean start when it is initially powered on at the site. Switch 1 should be placed in the down position upon power-up of the controller.

With Switch 1 ON, anytime the system is reset, a "COLD START" will occur.
With Switch 1 OFF (down), the system will reset with a "WARM START." A warm start does not wipe out the controller memory.

A system reset can occur for any of these reasons:

1. The reset button is depressed.
2. The CPU system voltage drops below 11.5 volts
3. The CPU automatically resets itself based on a built-in watchdog timer.
4. A Power surge occurs.

In the down position (switch 1 off), and with a fresh Lithium memory-backup battery installed, a warm reset will occur when any of these conditions occur.

Switch 2 – Not Used at this time

Switches 3 and 4 - Communication Method

Combinations of settings for switches set the method of communication between the controller and the PC or Network to which it is connecting.

Switch 3 **down**	and	Switch 4 **down**	= Direct cable connection
Switch 3 **up**	and	Switch 4 **down**	= Modem connection
Switch 3 **down**	and	Switch 4 **up**	= Ethernet/network connection

Switch 3 up and Switch 4 up = invalid setting.

If you are setting up a modem connection, make sure the controller has a "direct" phone number. It cannot use an extension or other type of phone connection that is interrupted by a switching system that would require dialing more numbers or being connected by a receptionist.

If you are setting up an Ethernet/network connection, you must use a device (such as a Lantronix device) that converts an RS 232 signal into an Ethernet signal (10-100 Mb). The network must also use a TCP/IP format.

Switches 5 and 6 – Network Bridge

Extending secondary – Switch 5 up, Switch 6 down
Switch 5 in the up position makes that controller an extending secondary. Being an extending secondary allows the controller to asynchronously communicate with another controller loop. This allows multiple remote sites to be monitored by the same PC. For more information on asynchronous communication between controllers, please see the "Network Connections" section titled "Network Bridge: Asynchronous controller communication."

Remote Primary – Switch 5 down, Switch 6 up
Switch 6 in the up position makes that unit a primary controller no matter what the unit number is. Unit 000 is still always a primary and should not have this switch in the up position. Switch 6 would be used when a customer needs local and remote sites to behave as one system. This enables two sites or controller loops to communicate asynchronously. Please see the "Network Connections" section titled "Network Bridge: Asynchronous controller communication."

Switches 7 and 8 - are unused at this time.

Baud Switches (S5)

To the right of the UNIT NO. switches, there is a bank of four switches labeled BAUD. These are used to select communication parameters and must be compatible with those selected on your PC or modem. Following is a list of the possible switch combinations and the settings associated with each of them.

9600: All switches in the ON (up) position. (Factory Default)
4800: Switches 1 and 3 in the ON (up) position,
Switches 2 and 4 in the OFF (down) position.
2400: All switches in the OFF (down) position.

These switches correlate to the settings within the communications options of the **Satellite** Software. Consult the **Satellite** User's Guide for further information on PC to controller communication.

Reset Switch (S6)

The final switch on the CPU is a push-button labeled RESET. When the controller is powered up, certain operations are performed, including the reading of the UNIT No. and OPTIONS switches. If any of the OPTION or UNIT NO. switches are changed, a reset must be performed. Simply press the button and release. The new parameters will then take effect.

ALWAYS MAKE SURE OPTION SWITCH ONE IS IN THE DESIRED POSITION BEFORE RESETTING.

LEDs

There are three indication LEDs to provide some basic information about the system. Each is labeled by its function. The PWR LED tells if the system is receiving power. The other two report the controller loop line status. XMIT is for the transmit signal while the RECV indicates that data is being received through the network input path. During normal operation, all three should be lit, however, the RECV and XMIT LEDs will be slightly dimmer than the PWR LED.

The PWR LED will light with less than 12 VDC. Always check DC voltage between J17 pins 8 and 9 to verify that the controller is receiving approximately +13.8 VDC.

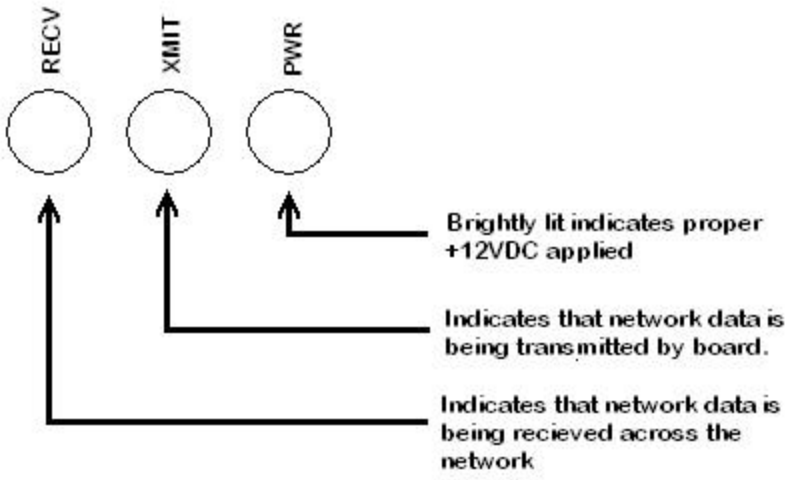


Figure 5

Batteries (B1 and B2)

The CPU memory and clock components are under battery backup protection in the event of power loss. The batteries may be removed from their respective sockets to save battery life before the unit is installed. The memory battery, located in position B1, is a coin type battery and can retain the system memory for a total of 90 days of down time. Galaxy Control System recommends changing this battery semiannually as routine maintenance. The clock battery, located in position B2, is also a coin type battery rated for ten years. Both batteries are socketed for easy replacement.

Network Connection

On the upper right corner of the processor board there is an 8 pin terminal strip connector labeled network. This is where additional controllers are attached, and system power is applied.

Port Configuration

Each port on a Satellite controller can be used as a reader port or an Input/Output Port. Only one device can be used on a port at a time. The port type is specified in the **Satellite** software (in the Controller Properties window). Consult the **Satellite** User Manual for instructions on how to program the software.

Reader Port

The basic wiring for a Galaxy Reader Port can consist of the 5 or 6 reader wires, a door contact, a request to exit device, a lock of some sort and a device such as a sounder. This diagram shows the how a typical reader port is wired.

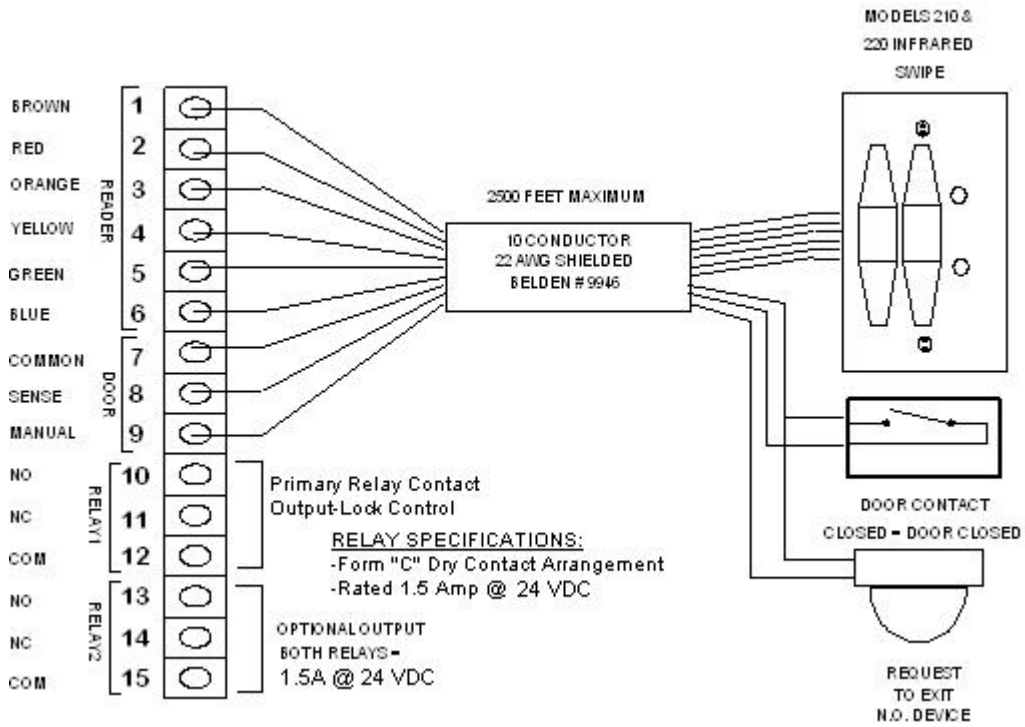


Figure 6

The above color codes indicate which color wire goes into each pin for Galaxy Control System's Infrared Reader. A diagram of each type of reader, indicating its specific wiring, can be found in this section. The following describes each pin's function for a Satellite controller reader port.

Note: If you do not use door contacts, place a jumper between the Common and Sense pins.

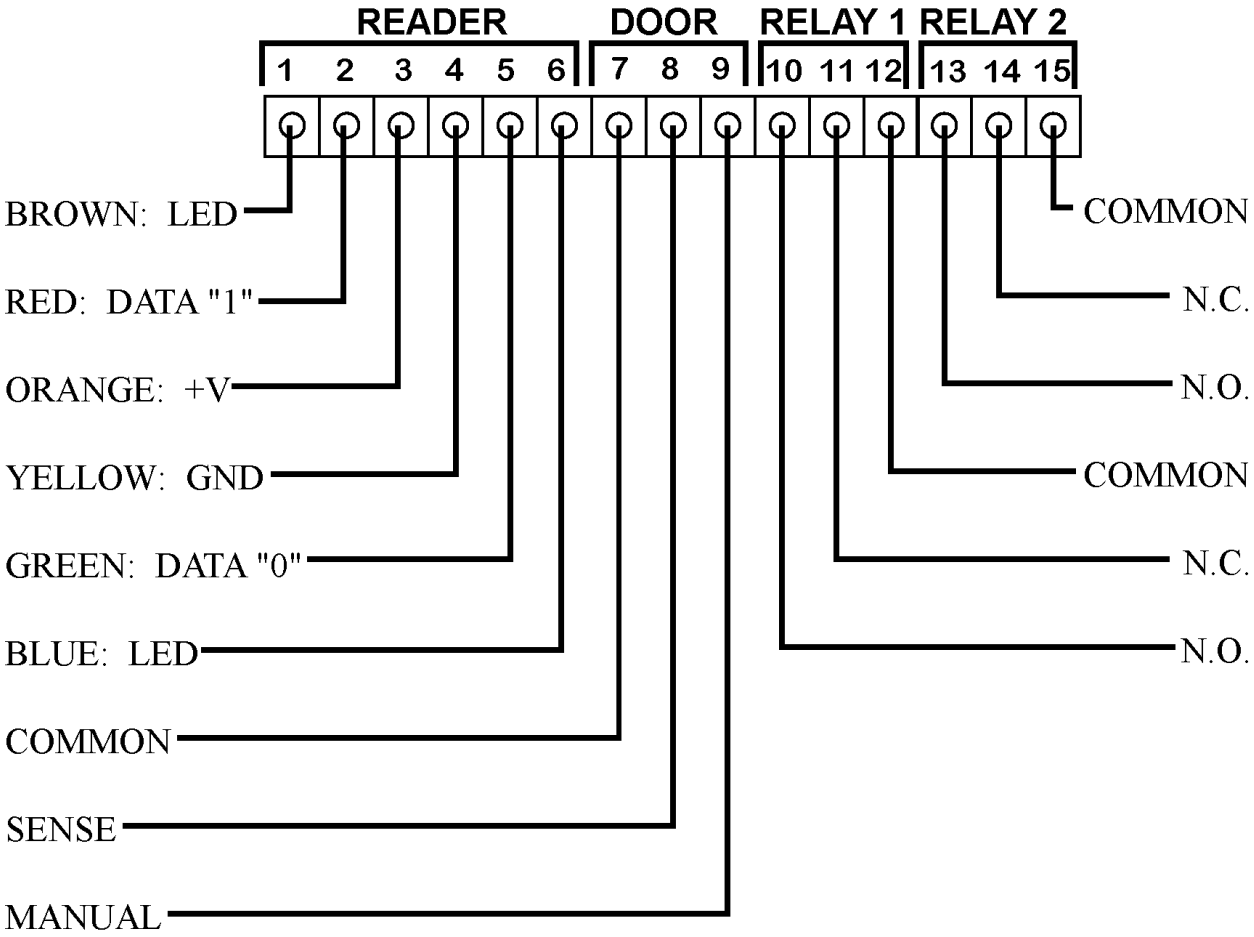


Figure 7

Pin 1: This is the green LED for Galaxy Control System's Infrared readers and the LED line for all others.

Pin 2: This is Data 1 for the reader.

Pin 3: This is the positive voltage that is output by the processor board. Depending upon how the jumper (J1 or J5) is set, the voltage here will either be +5 VDC or +12 VDC. Check the reader specifications before setting the voltage jumper.

Pin 4: This is the reader ground.

Pin 5: This is Data 0 for the reader.

Pin 6: This is the red LED for Galaxy Control System's Infrared format readers. Because most other readers support only one LED this is unused for all other readers.

Pin 7: This pin is the common pin for the Door Contact and the Request to Exit Device.

Pin 8: This pin is the sense pin. The Door contact should wire between this pin and pin 7 (common). When the door is closed, the panel must see a contact closure between these pins. If contacts are not being used, the jumper associated with that port (J3 and J5) must be placed in the marked position (marked with a white line next to the jumper).

Pin 9: A Request to Exit Device can be wired between this Pin and pin 7 (common). This Device is normally open. When the panel sees a closure, it can be programmed to shunt the door contact and trigger Relay One or just shunt the door contact.

Infrared Swipe Readers and Keypads

The following diagram of the Processor Board describes each pin's function for a Galaxy reader port. Pin 1 is on the left.

Galaxy recommends using 10 conductor, 22 AWG (Beldon # 9946), shielded cable for the reader (6), door sense (2), and manual egress wiring (2). Maximum distance is 2500 feet. All cables should be run inside a grounded conduit with only the controller end of the cable shield grounded. Do not run cables in conduit that already has wire in it. The reader, door sensor and egress device wires should be kept in a separate cable from the relay output, because door releases generally draw more power than the other devices and may cause interference and voltage spikes if both are in the same jacket.

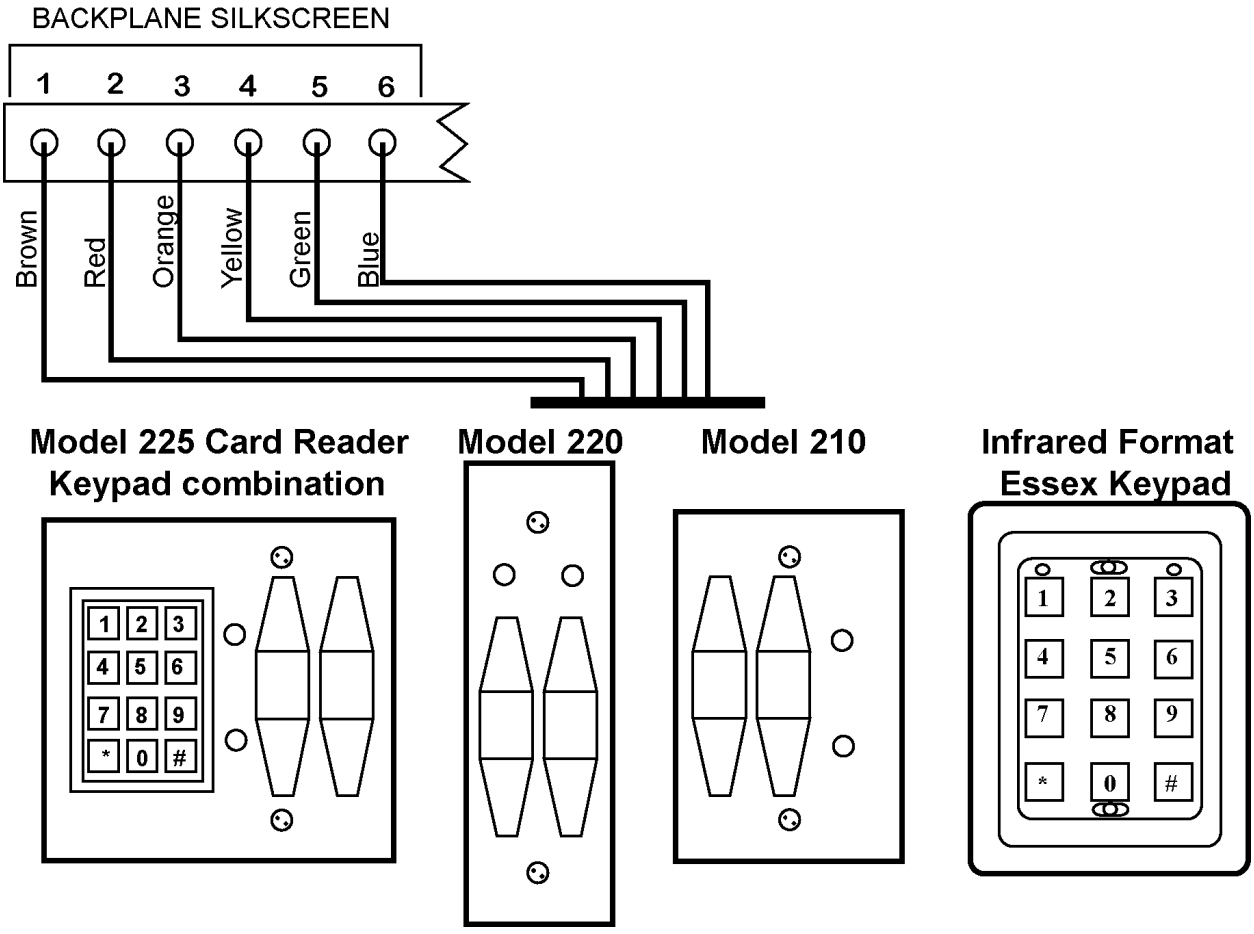


Figure 8

This diagram illustrates the color of the wires as they are wired to the port pins for Galaxy devices.

The CPU voltage jumper (J1 or J5) must be set to 12 volts for this reader.

Wiegand Swipe Reader

Galaxy Control System's Satellite controller can use Wiegand readers to identify industry standard Wiegand cards. The Wiegand reader provided by Galaxy (Part # 90-0724-00) uses the "26 bit" Wiegand format

When using Wiegand Swipe readers, the card will only function when swiped in the correct direction. If cards are swiped in the wrong direction, the controller will not acknowledge the activity. For this reason, the Duress feature cannot be used with Wiegand Swipe readers. Additionally, these readers cannot be used with alarm cards to Arm and Disarm the systems

alarm partitions. Only Galaxy Control System's Infrared format readers and keypads can be used for Duress or to Arm and Disarm alarms.

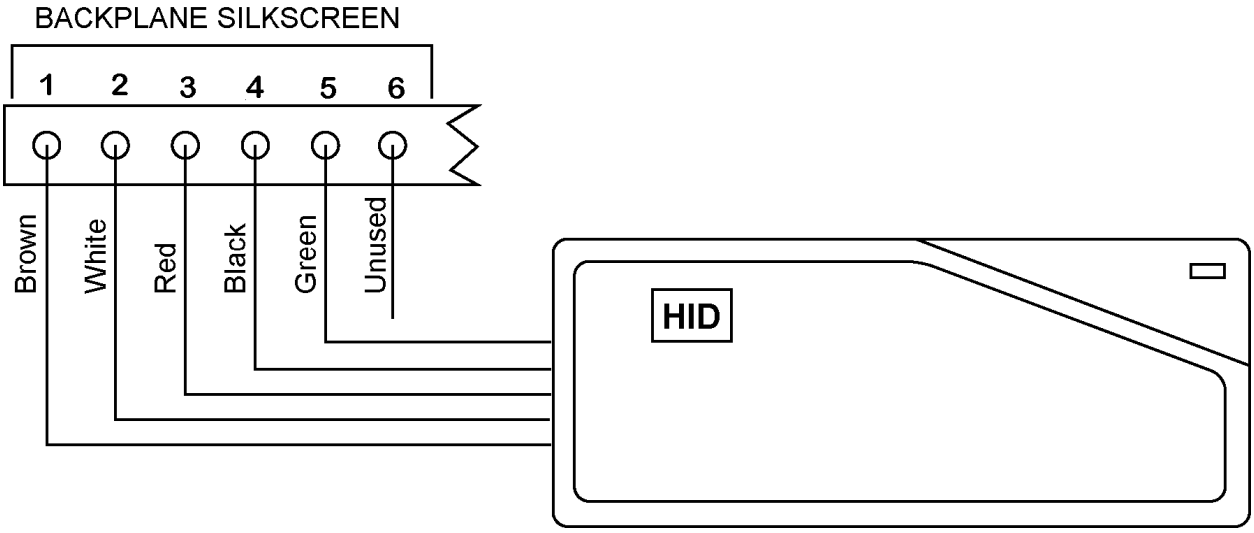


Figure 9

The remaining connections for door contacts, request to exit devices and output relays can be found in the "Door Contact/Rex" and "Lock Wiring" sections. The maximum controller to reader distance using 22 AWG shielded cable is 500 feet. **The CPU voltage jumper (J1 or J5) must be set to 5 volts for this reader.**

Magnetic Stripe Reader

Galaxy Control System's **Satellite Controller** can use Magnetic Stripe readers to identify most industry standard Mag Stripe formats. The Track II Mag Stripe reader provided by Galaxy (Part #'s: Black: 90-0010-00 & Chrome: 90-0011-00) uses the "ABA" format.

When using MR Sensor's magnetic stripe reader, the card can be swiped in only one direction. If cards are swiped in the wrong direction, the controller will not acknowledge the activity. For this reason, the Duress feature cannot be used with magnetic stripe readers. Additionally, these readers cannot be used with alarm cards to Arm and Disarm the systems alarm partitions. Only Galaxy Control System's Infrared format readers and keypads can be used for Duress or to Arm and Disarm alarms.

The remaining connections for door contacts, request to exit devices and output relays can be found in the "Door Contact/Rex" and "Lock Wiring" sections. The maximum controller to reader distance using 22 AWG shielded cable is 500 feet. **The CPU voltage jumper (J1 or J5) must be set to 5 volts for this reader.**

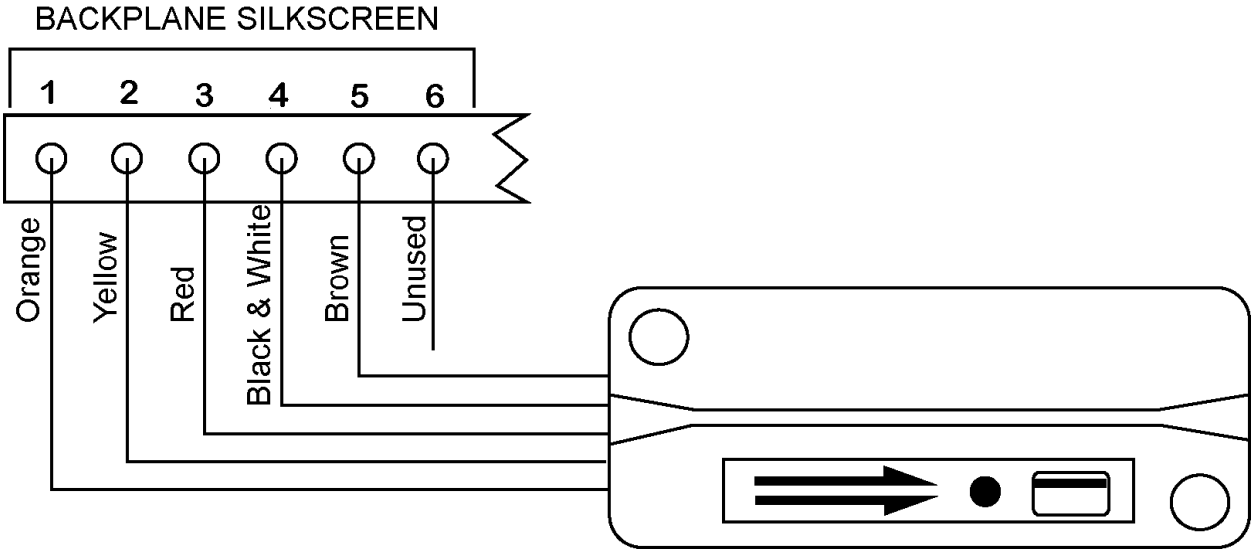


Figure 10

Barcode Readers

Galaxy Control System's **Satellite Controller** can use a barcode reader to identify most industry standard barcode formats. The Barcode reader provided by Galaxy (Part # 90-0840-00) uses the "ABA" (Magnetic Stripe) format.

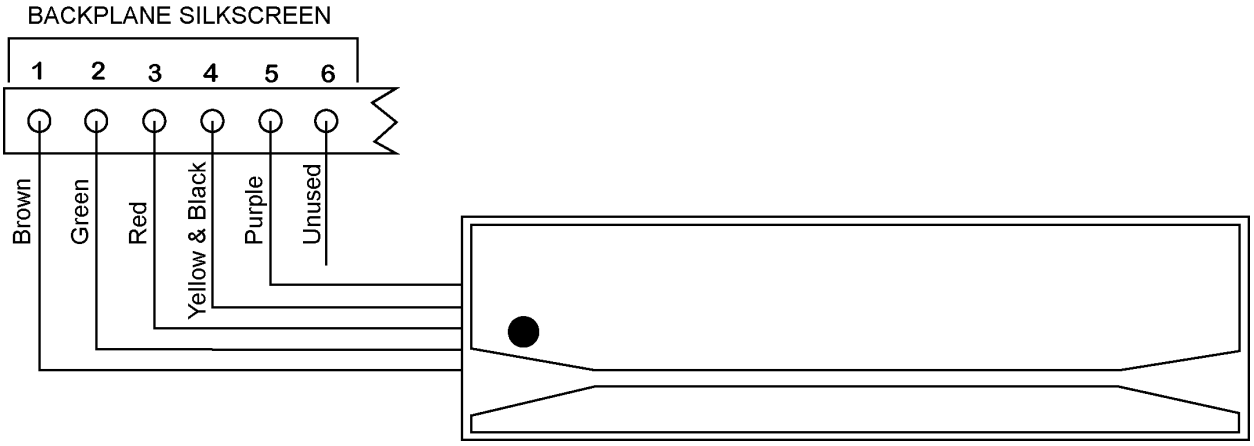


Figure 11

When using a standard barcode reader, the card does not provide a "direction." For this reason, the Duress feature cannot be used with barcode readers. Additionally, these readers cannot be used as alarm cards to Arm and Disarm the systems alarm partitions. Only Galaxy Control

System's Infrared format readers and keypads can be used for Duress or to Arm and Disarm alarms.

The remaining connections for door contacts, request to exit devices and output relays can be found in the "Door Contact/Rex" and "Lock Wiring" sections. The maximum controller to reader distance using 22 AWG shielded cable is 500 feet. **The CPU voltage jumper (J1 or J5) must be set to 5 volts for this reader.**

Essex keypads

Galaxy offers three formats of the Essex keypad: Infrared, ABA, and Wiegand. These formats are available so that Pin Required can be used with Infrared, Magnetic Stripe and Wiegand format stand alone readers. Below are the wiring diagrams for the ABA and Wiegand formats. The Infrared format diagram can be found in the "Infrared Swipe Reader and Keypads" section. Please contact Galaxy Control System's Technical Support to find out which format of Essex keypad is best for your application.

ABA Format

The "ABA" version of the Essex keypad (Part # 90-0050-00) provides "ABA Track II" format data to the controller. When using this diagram make sure the label on the back of the keypad identifies it as the "ABA Track II" format.

Alarms cannot be Armed or Disarmed and the Duress feature cannot be used with Non-Infrared format keypads. Only Galaxy Control System's Infrared format readers and keypads can be used for Duress or to Arm and Disarm alarms.

The remaining connections for door contacts, request to exit devices and output relays can be found in the "Door Contact/Rex" and "Lock Wiring" sections. The maximum reader-to-controller distance is 500 feet when using 22 AWG shielded cable **The CPU voltage jumper (J1 or J5) must be set to 12 volts for this reader.**

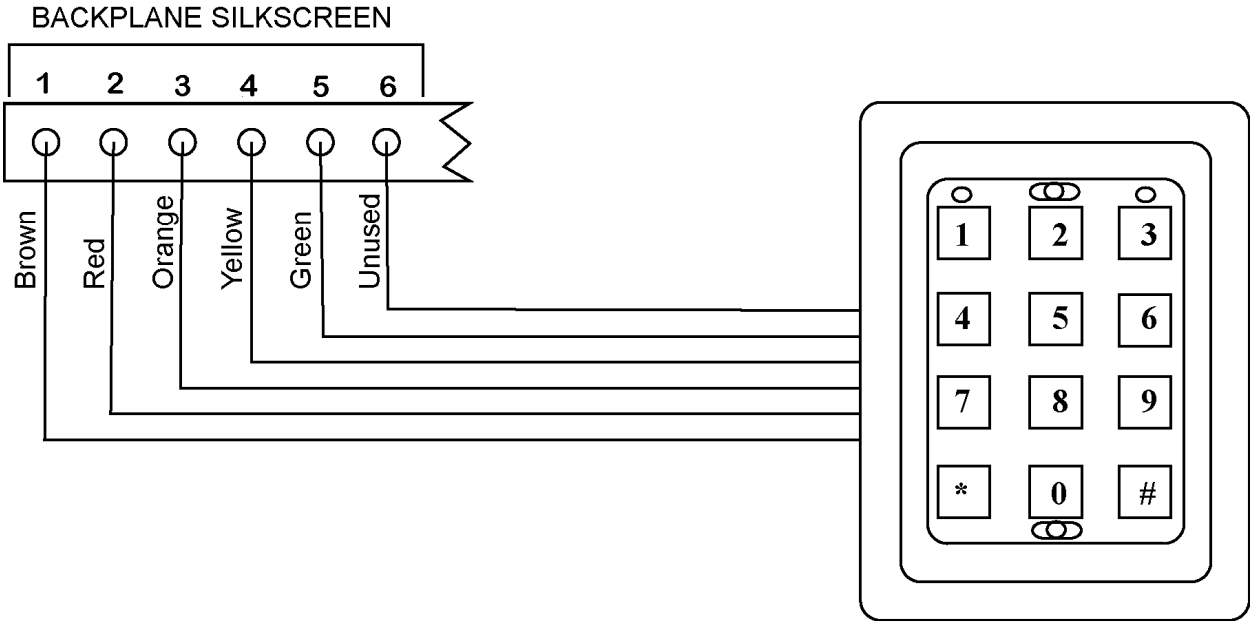


Figure 12

Wiegand Format

The “26 bit Wiegand” version of the Essex keypad (Part #90-0060-00) provides 26 Bit Wiegand data to the controller. When using this diagram make sure the label on the back of the keypad identifies it as the “Wiegand” format.

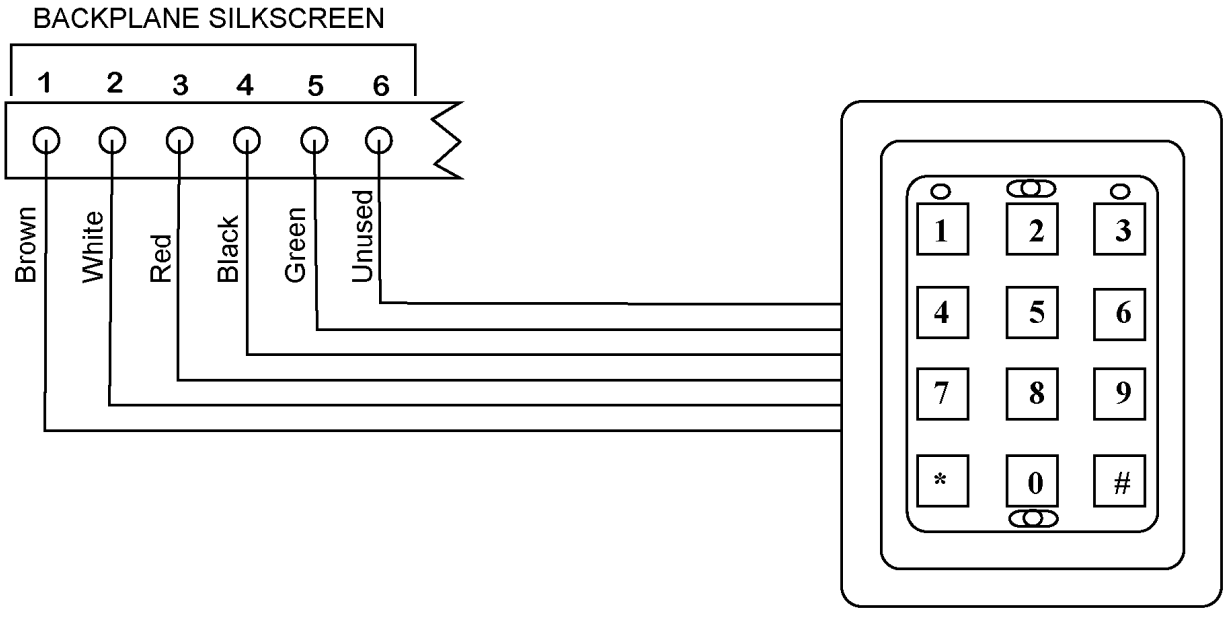


Figure 13

Alarms cannot be Armed or Disarmed and the Duress feature cannot be used with Non-Infrared format Keypads. Only Galaxy Control System's Infrared format readers and keypads can be used for Duress or to Arm and Disarm

The remaining connections for door contacts, request to exit devices and output relays can be found in the "Door Contact/Rex" and "Lock Wiring" sections. The maximum reader-to-controller distance is 500 feet when using 22 AWG shielded cable. **The CPU voltage jumper (J1 or J5) must be set to 12 volts for this reader.**

Proximity Readers

Galaxy Control System's **Satellite** Controller supports HID as well as most other Proximity devices which are Wiegand format outputs. There are also portal and road loop readers available; however, these models are not discussed in this manual. For information on these systems, contact Galaxy Control System's Technical Support Staff. The Proximity readers provided by Galaxy use the "26 Bit Wiegand" format.

Alarms cannot be Armed or Disarmed and the Duress feature cannot be used with Non-Infrared format readers. Only Galaxy Control System's Infrared format readers and keypads can be used for Duress or to Arm and Disarm alarms.

Do Not install the read head/antenna in close proximity to devices that could emit radio frequency interference such as computer monitors, cordless telephones, and radio transmitters. Any device that emits RF interference in the area of the read head/antenna will reduce the overall read range. Some large computer monitors can emit RF for up to 40 feet. In addition, do not install the read head/antenna on metallic surfaces of any kind. The metal will greatly reduce the read range. Most window glass in today's buildings contain some percentage of metallic silver used to reflect ultraviolet rays. These metallic qualities will reduce the maximum read range that can be achieved. Proper grounding is crucial for optimum read ranges to be achieved.

When wiring the device, the shield and ground (Black) wires from the reader **CANNOT** be connected together, otherwise a ground loop condition may occur. This will cause the maximum read range to be reduced.

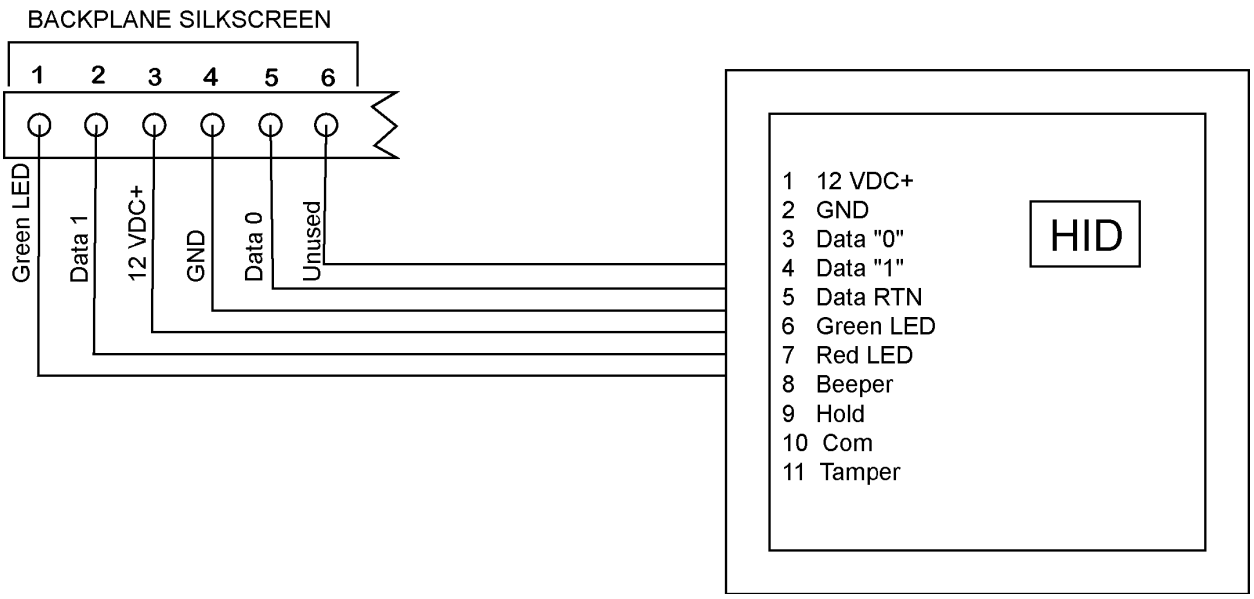


Figure 14

The remaining connections for door contacts, request to exit devices and output relays can be found in the “Door Contact/Request to exit” and “Lock Wiring” sections. The maximum controller to reader distance using 22 AWG cable is 500 feet. For HID and most other proximity readers the CPU jumper setting (J1 or J5) is 12 volts. Please check the documentation that accompanies the reader or contact Galaxy Control System’s Technical Support for assistance.

HID Prox Pro with Keypad

In order to adjust the Facility Code for the Prox Pro with Keypad a set of configuration/reset cards are required. Contact Galaxy to obtain these. Follow these instructions to reset the keypad

1. Once the Prox Pro with keypad is wired and the keypad is connected, power on the device.

2. After the initialization beeping for the reader has stopped, pass the Reset card over the reader. The reader should beep again.

3. After the beeping stops again, pass the configuration card over the reader and type the desired facility code followed by #. Galaxy suggests 096#.

To test the keypad, go into the Cardholders window and add a 26-bit Wiegand format card (see user guide for adding a card). If 96 appears as the Facility code and 1234 comes in as the card code then the procedure worked properly. Please contact Galaxy if you have any questions about this procedure.

Parallel Reader Module

In certain cases, it is desirable to attach more than one reader to a single port. The Parallel Reader Module makes this possible.

Two readers on one port

A customer who does not need to differentiate the direction of travel but wants to control the entrance and exit through a given door can do so with one port. Installing a Parallel Reader Module allows two readers to be installed on the same port--one on either side of the door. Both readers then appear as one to the controller.

The Anti-Passback function cannot be implemented on a particular door if readers on both sides of that door are wired into the same Parallel Adapter. This is because there is then no way to assign each reader into a different Passback Area.

Pin required

The **Satellite** controller can be programmed to require both a card and PIN code for entry. This can be accomplished with either the Model 225 Card Reader/Keypad Combination reader or by using a separate card reader and keypad connected together with a Parallel Reader Module. This option can also be exercised with Wiegand output devices, Magnetic Stripe, and Barcode readers.

Installation

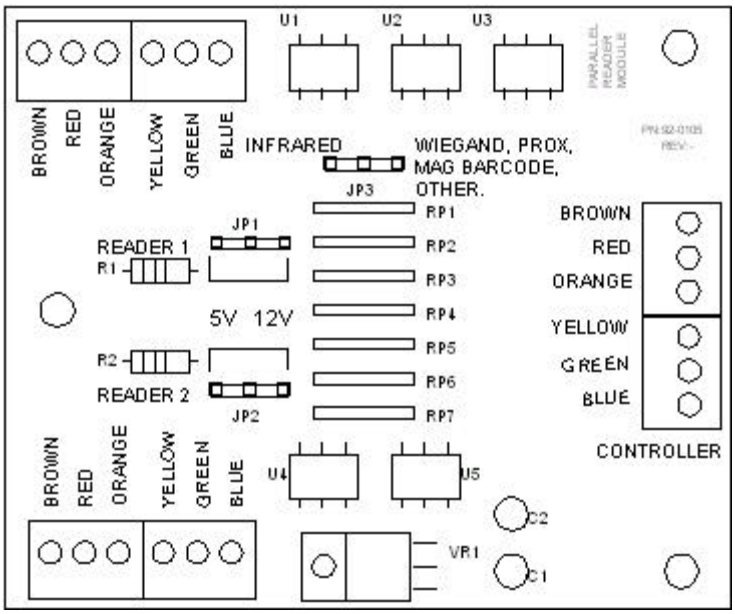


Figure 15

The Parallel Reader Module is very easy to install. There are three sets of connectors, two for the readers and a third which connects to the controller port. There are six terminal pins for each of the three connectors, all labeled according to Galaxy Control System's infrared reader color code. There are also three separate jumpers which must be set correctly for the device to function. Two of the three jumpers (JP1 and JP2) are used to select reader voltage. Each reader can be powered by either +12 V or +5 V, depending on the reader requirements. The third jumper (JP3) is used to select the reader type. If these jumpers are not set correctly,

the device will not operate as intended. The Parallel Interface can be used in two modes: Infrared or Other Reader formats. To select Infrared, Jumper JP3 should be placed on the left hand two pins. In order to use the module for other readers, JP3 is placed on the right most two pins. Both readers used in the module must put out the same format. For example, an Infrared reader would not work with a proximity reader through a parallel reader interface, but a proximity reader will work with a Wiegand format Essex keypad.

NOTES:

1) Install the Parallel Reader Module as close to the readers as possible.

Figure 16

2) Use 18 AWG wire rather than 22 AWG. This is required to provide sufficient current to the readers.

3) When using the PIN-required option, always choose the correct version of Essex Keypad.

- ❖ With Magstripe, barcode and any other ABA reader USE THE ABA VERSION OF THE ESSEX KEYPAD.
- ❖ With Proximity, Wiegand Swipe, Wiegand Key, and any other 26 bit Wiegand format USE THE 26 BIT WIEGAND VERSION OF THE ESSEX KEYPAD.
- ❖ With any Galaxy Infrared format reader USE THE INFRARED FORMAT OF THE ESSEX KEYPAD

4) ALWAYS set the CPU board voltage to +12 V when using the Parallel Reader Module. The Reader Voltage jumpers on the Parallel Reader Module will be used to regulate the voltage to the desired voltage. For 5 volt readers the Parallel Reader Interface voltage must be set to +5 V

Door Contact/Request to Exit

On each port, pins 7 through 9 on the Processor Board are the COMMON, SENSE, and MANUAL pins, respectively. These are the door contact/sensor and manual egress inputs with Pin 7 being common to both. To use the door sense capability, a sensor, which generates a closed circuit when the door is closed, is required. Usually a magnetic switch with *Normally Open* (NO) contacts is used (When the door is closed the contact should be closed). This device should be wired between Pins 7 and 8. If door open sensors/contacts are not being installed, the jumper associated with that port (J3 and J5) must be placed in the marked position (marked with a white line next to the jumper) so that the system thinks that the door is always closed. If this is

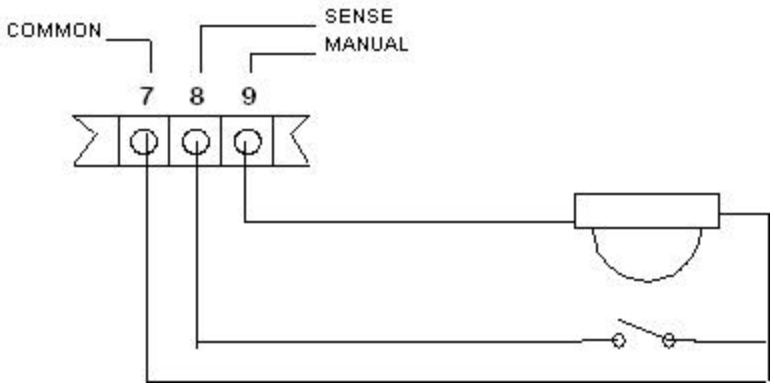


Figure 16

not done, once the readers are powered up, both reader LED's will come on (This indicates a Forced Open condition) and eventually both LED's will go off (This indicates a Door Left Open condition. Default time is 15 seconds before both LED's turn off). In addition, the readers will not recognize any card swipes.

The manual egress Request to Exit input allows the lock control relay (Relay 1) and door contact to be activated by means other than a card. The egress device can be anything which produces a momentary contact closure between Pins 7 and 9. Two examples of manual egress devices are a push button switch and a motion detector with contacts.

Lock Wiring

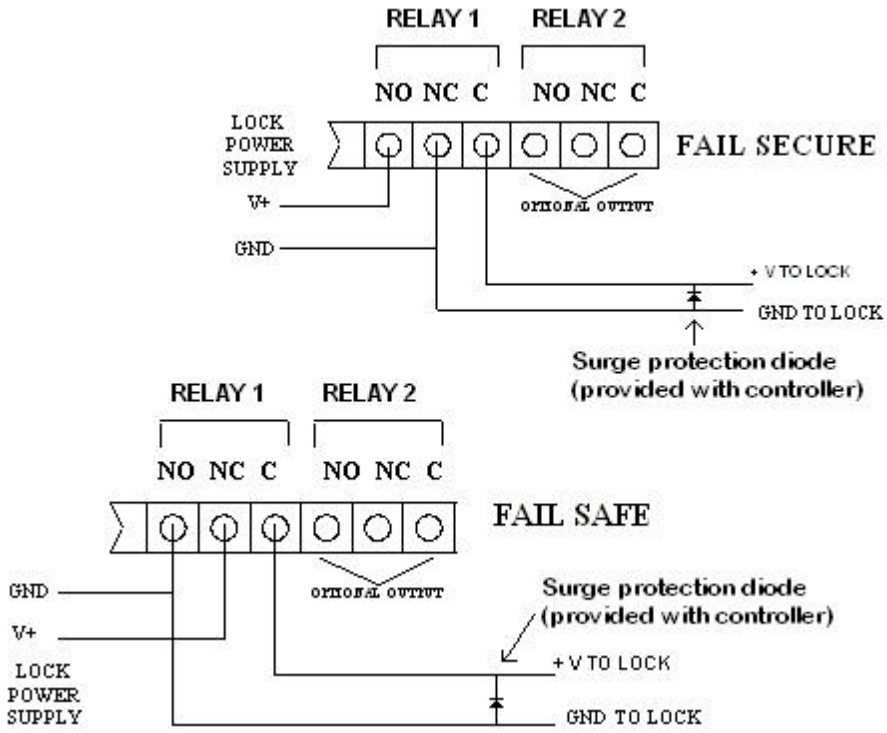


Figure 17

The port pins labeled Relay 1 and Relay 2 are outputs which are used to control a door release and/or other devices. Pins 10 through 12 are assigned to Relay 1, while Pins 13 through 15 are assigned to Relay 2. Each relay consists of a Normally Open (NO), a Normally Closed (NC) and a common contact. Typically, Relay 1 is used for strike/lock control. Relay 2 can be used for anything that can be controlled by a contact closure or opening, such as an alarm shunt, a sounder or CCTV control. Upon access being granted, Relay 1 will energize. Relay 1 will remain active for the time specified in the System Software or until the Door Sensor indicates that the door has opened. Relay 2, if used, is independently timed and can be configured to activate for all of its door alarm events as well as its own valid unlock.

When wiring door releases, the output contacts should act like a switch between the strike lock and its power supply. For devices which need power applied to lock and release only when power is removed (fail-safe), the Common and Normally Closed outputs are used. If the strike requires power to unlock (fail-secure), the Common and Normally Open pins would be used. The maximum power through the contacts should not exceed 24 VDC @ 1.5 amps.

Do not use the controller power supply for the strikes.

Programming Reader

Cards can be swiped or learned into the **Satellite** system using a Galaxy provided RS-232 Programming Reader/Interface. This interface allows Transmissive Infrared, ABA and Wiegand reader technologies to plug into a communication port on the back of the PC. Cards can still be added to the system through a reader on a controller, however. The RS-232 Programming reader does not occupy a port on the Satellite controller.

The Programming Reader Interface can be purchased from Galaxy with any of our provided readers attached. The Programming Reader works well for dial up systems where swiping cards into a system used to be quite difficult.

Interface to PC connection

The Programming Reader Interface wires into a communication port on the **Satellite** system PC using the configuration shown.

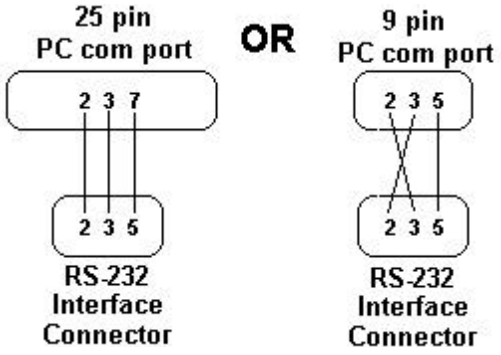


Figure 18

Reader to interface connections

There are two connectors for readers to be attached on the RS-232 interface. One is labeled INT (internal) and the other is labeled EXT (external). The internal connection is usually already wired from the factory. The External connection can be used for any Galaxy supported reader type. Both connectors are labeled 1-6 with the pins having the properties shown in the diagram. An infrared reader would wire as shown, but a Wiegand reader would wire, Brown to pin 1, White to 2, Red to 3, Black to 4, and Green to 5, just as a regular Wiegand reader would. Additional reader wiring can be found in the individual reader's section of the Installation manual.

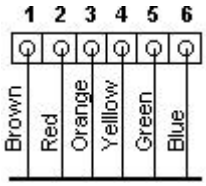


Figure 19

Voltage jumper

There is a voltage jumper on the RS-232 Reader Interface. **The jumper must be set to 5 volts for all 5 volt readers or the readers and the Interface will be damaged.**

INT/EXT Switch

This switch is used to tell the interface which connector, internal or external, it should be receiving data through. Be sure to flip the INT/EXT switch accordingly when changing from using the internal reader to the external reader or visa versa.

Dip Switches

The bank of dip switches is used to tell the RS-232 interface what type of data, Infrared, Wiegand, or ABA, it should be receiving from the reader and transmitting to the computer. This is how the switches need to be set for the three different data formats.

Infrared: All OFF
Wiegand: #1 ON, all others OFF
ABA: #2 ON, all others OFF

Input/Output Ports

Each of the two Input/Output ports can monitor and annunciate alarms. When a port is configured as an Input/Output Port in the **Satellite** software, the wiring connections take on the functions shown in the following diagram. Each Input/Output Port can accept up to four inputs and can produce two relay outputs (Processor Board Relays 1 and 2) and two Open Collector Outputs (Pin 1 and Pin 6).

Inputs

The Inputs for the Input/Output port are as follows: Pin 2 is Input 3, Pin 5 is Input 4, Pin 8 is Input 1 and Pin 9 is Input 2. All inputs are normally closed. Inputs 3 and 4 share Pin 4 while Inputs 1 and 2 share Pin 7. Galaxy Control System's technical support department recommends that a .1 microfarad capacitor be installed on Inputs 3 and 4. This will prevent any false alarms that may result from the contact bouncing and generating multiple alarms. The capacitor is not necessary for Inputs 1 and 2. The debounce circuitry is built in to these lines. In the software, these inputs can be programmed to trip any local or global outputs.

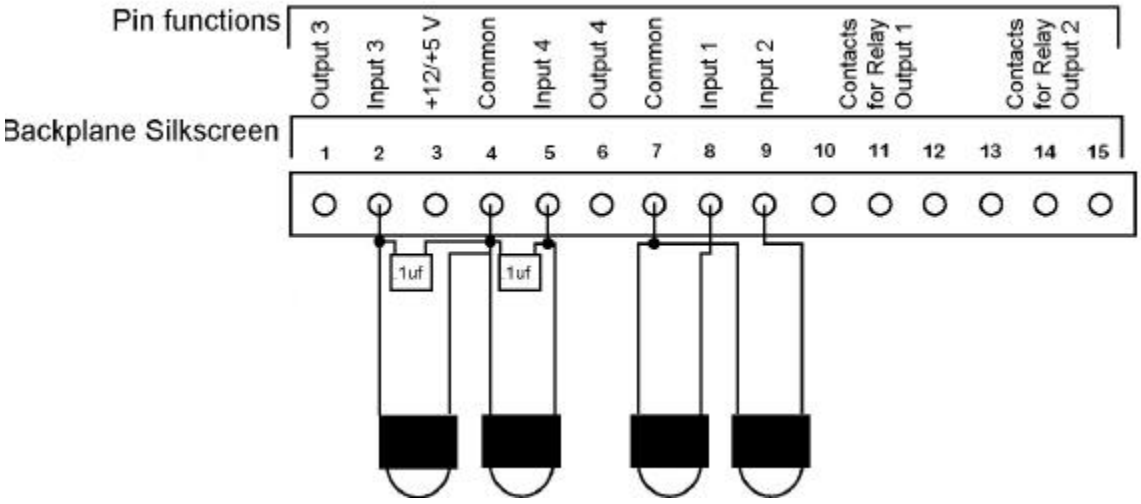


Figure 20

Outputs

Outputs 1 and 2 are Form C relays 1 and 2 on the Processor Board. Output 3 is Pin 1, Output 4 is the Pin 6 and both are Open Collector Outputs. The open collector outputs are suitable for driving low-current circuits such as LEDs or low-current relay coils. The output is

pulled low by the controller when the output is on (current flowing). External components must complete the circuit by providing an electrical pull-up to positive voltage, as shown in the following diagrams. These outputs can be tripped by any I/O Group.

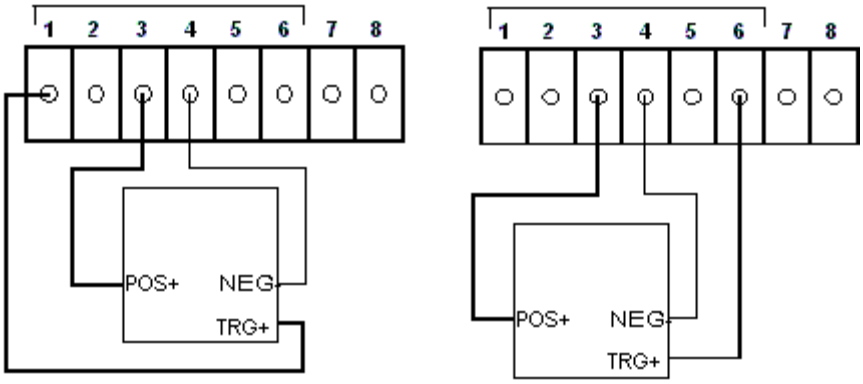


Figure 21 –Wiring I/O Ports for Relays

The type of relay shown in the above diagram is comparable to the Altronix RBSN-TTL. The relay selected must support a positive trigger (as shown in the diagram).

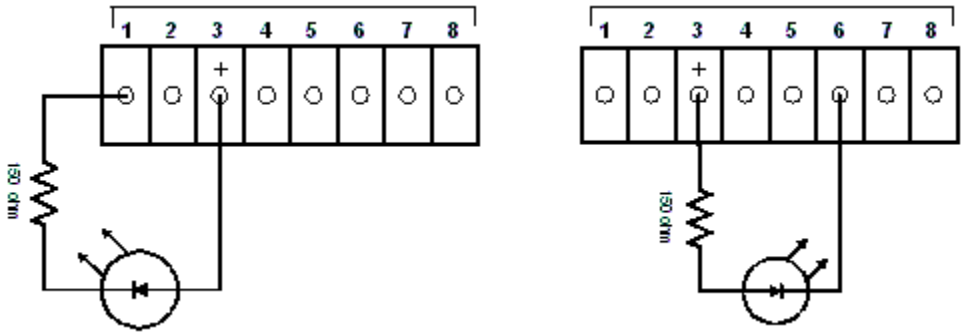


Figure 22 – Wiring I/O Ports for LEDs

When wiring an LED from the I/O port, a 150 ohm resistor is the typical (minimum) resistance. A higher resistance will result in a dimmer LED.

When wiring either relays or LEDs, do not attempt to connect a separate power source.

Communications and Power Configuration

J17 is a 8-position screw terminal connector located on the upper right corner of the Processor Board, labeled NETWORK. This is where networked controllers are attached and controller power is applied. J15 is a 6-position screw terminal connector also located at the top of the Processor Board , labeled PWR/MODEM RELAY. This is the modem relay connections are made.

Network Connections

In a Satellite controller network, the controllers form a daisy-chain loop around which the controller data travels for all units to utilize as necessary. The main controller is designated as the primary controller while the rest are called secondaries. The maximum number of controllers in one network is 128.

The four pins on the right of the terminal connector are labeled IN, IN, and OUT, OUT. All controllers transmit network information through the OUT pins to the next controller. The next unit receives the data on the IN pins, then retransmits it out on the OUT pins. The data travels completely around the network loop in this manner and is eventually received in by the primary unit's IN pins. Each Processor Board comes with two jumper wires between each set of IN/OUT pins. These jumpers are required for a stand alone primary so that the controller network is complete. **THESE JUMPERS MUST BE REMOVED WHEN MORE THAN ONE CONTROLLER IS ON THE NETWORK.**

Direct Connection

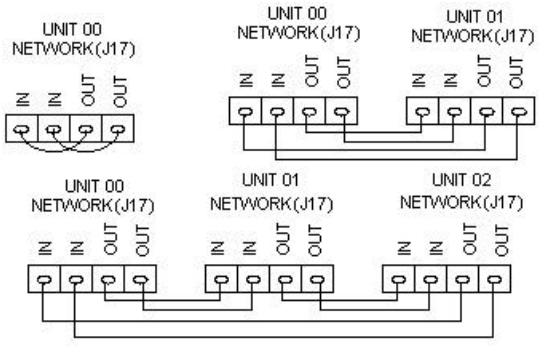


Figure 23

This figure illustrates network wiring for 1, 2 and 3 controller systems. If larger systems are required, simply wire the additional units into the network in the same fashion as shown with the three controller illustration. It is necessary to observe polarity when wiring the network. The OUT of one unit must go to the IN of the next unit and likewise with the other IN/OUT pins.

When wiring the network, use 4 conductor, 22 AWG (Beldon #8723) shielded, twisted pair cable. It should be in its own grounded conduit with the

shield attached to ground at one end only. Keep the conduits as far away as reasonably possible from all high power and/or high frequency lines. If there are any questions or doubts concerning the running of wires, please contact Galaxy before proceeding. The maximum distance between controllers is 1000 feet at 9600 Baud.

Line Drivers

Galaxy strongly recommends that Line Drivers be used when the network distance between controllers is greater than 1000 feet, but less than 1.5 miles. Line Drivers are easy to install and require no hardware changes to the controllers. **Galaxy** can supply Black Box's SHMB-2 Short Haul Modem. Other communication technologies such as fiber optics, laser and radio frequency devices can also be used, however, Galaxy Control System's Engineering Staff should be consulted prior to installing these types of devices.

This diagram shows how the line drivers are connected in a one controller to one controller setup. The data comes "OUT" of the primary controller, passes through the line drivers and "IN" to the secondary controller. The data then completes the loop by passing "OUT" of the secondary controller, back through the line drivers and then "IN" to the primary.

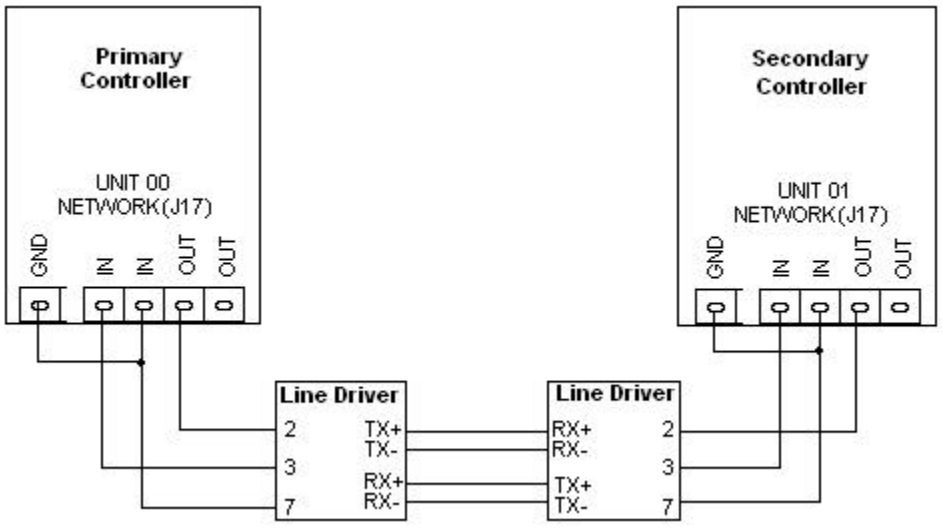


Figure 24

The second diagram shows the wiring configuration that would be used in a two controller to two controller setup. In this diagram, the data passes "OUT" of the primary and "IN" to the local secondary (second from the left). The data then travels "OUT" of the local or first secondary and through the line drivers to the remote site. At the remote site, the data is received "IN" by the second controller from the right. It then transmits the data "OUT" to the farthest right controller. That controller then transmits the data through the line drivers and "IN" to the primary controller. These examples should provide enough reference information when designing the wiring for different numbers of controllers at each location.

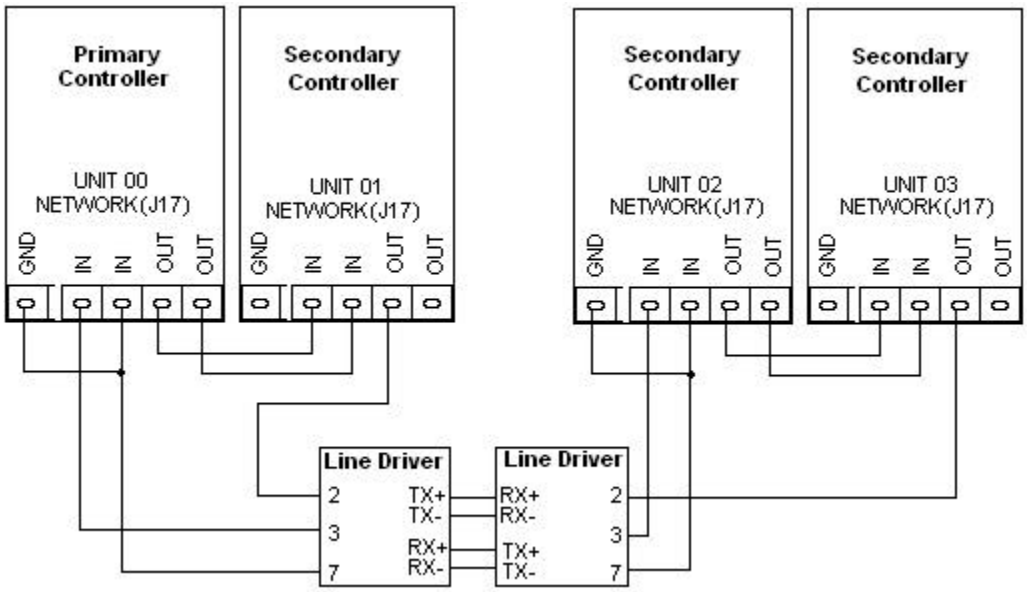


Figure 25

Network Bridge: Asynchronous Controller Communication

Many customers need to monitor their local system and a remote site or sites simultaneously on the same PC. Additionally, it is sometimes required that when cards are entered into one system, they are automatically entered into the others and that when an alarm event occurs on a remote system, it is annunciated on the local system. This can be done using asynchronous communications between controllers. With **Satellite**, secondary controllers have the ability to communicate with other controller loops. All programming is still done from the local computer; the only difference is the way the information passes back and forth between the loops. In the diagram, notice that each controller loop is independent and the only connection between the two loops is an RS-232 connection.

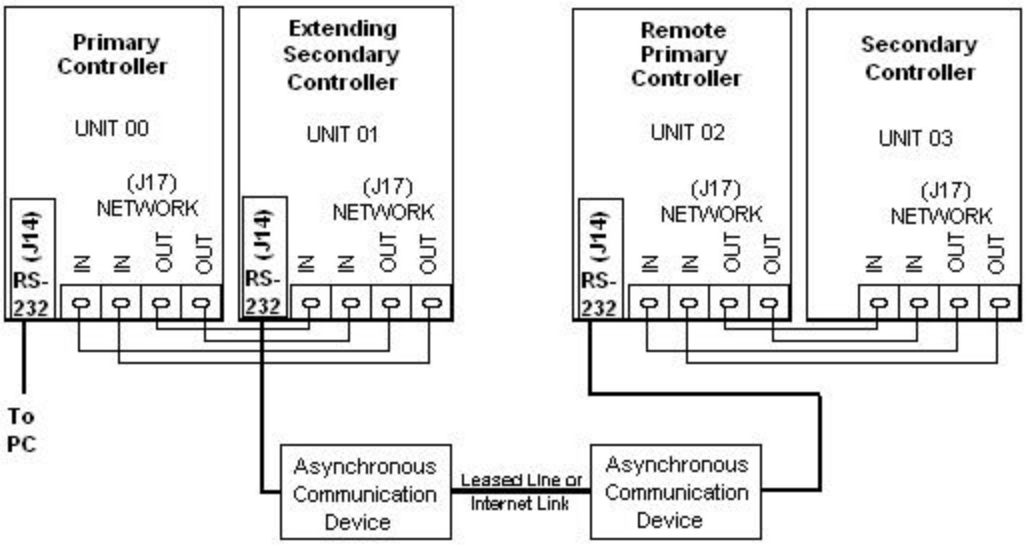


Figure 26

There are several different kinds of devices that can be used as a Network bridge between controllers. Each type of device has advantages and disadvantages. Please contact Galaxy Control System's Engineering staff to determine which would be best for your system.

Lantronix MSS1

The Lantronix MSS1 is an Internet communication device that enables RS-232 format data to travel between points on a Computer Network. Because Computer Network Traffic can greatly affect how the Satellite panels communicate, it is necessary to consult **Galaxy**'s Engineering Support before specifying or installing these devices.

See the "Lantronix Configuration" for instructions on configuring the device (p. 42).

Motorola UDS v.3225

Digital leased lines can also be used to create a Network Bridge between controllers. Below is a description of how the Motorola UDS v.3225 needs to be configured.

EXTENDING SECONDARY	REMOTE PRIMARY
Modem Options	
DCE rate is 9600 Trellis	same
Normal Originate	Forced Answer
4 Wire	same
Tx level --15 dBm	same

Dial Line jack is RJ-45		same
DTE Options		
Async Data		same
Make DTE Rate same on both modems		
8 Bit char size		same
No Parity		same
Ignores DTR		same
DCD is normal	same	
CTS follows RTS		same
RTS-CTS delay is 0ms		same
DTE Fallback-disabled		same

Black Box 201 BC/AS

Analog leased lines can also be used for the Network Bridge. The settings below designate how the switches and jumpers need to be set for the Black Box 201BC/AS devices to function properly. Analog lines can only communicate at 2400 baud so set the Satellite CPU baud rate accordingly.

S1: 1,4,6,8 up	S2: 2 up	S3: none up		
E2:	E3 CGND	E4: RX	E5: Out	E6: For test -12 Normally 0
E7: B	E8: B	E9: OUT	E10: IN	E11: -45
E12: B	E13:	E14: D	E15: D	

When testing the modems locally, use the following connections for the RJ-45 cable between the modems: pin 3 to pin 4; pin 4 to pin 3; pin 5 to pin 6; pin 6 to pin 5

US Robotics Courier V. Everything

A standard US robotics Courier modem may be used for certain applications of the Network Bridge. The following AT commands need to be sent to the modem at the Remote Primary

ATS13=16&W	At Power on or Reset this dials the number of the extending secondary stored at position 0
AT&Z0=number&W	Store phone number of the extending secondary at position 0.
AT&B1&W	Fixes serial communication rate

AT&N=6	Sets maximum connection rate. 6=9600 baud; 4=4800; 3=2400
Modem Switch Settings:	Extending Secondary: 1,2,4,5,6,7, and 9 up Remote Primary: 1,2,4,6,7,9 and 10 up
Controller to Modem cable:	2 3 4 5 6 7 8 1 to 3 2 4 5 6 7 8 20

PC Connections

Direct Connection

In order to communicate to the **Satellite controller**, a Personal Computer must be used. The PC connects to the primary controller using the 8-pin female DB connector (J14) on the Processor Board. The connection uses the standard RS-232 interface and is used to configure and observe the system. Most of the time the connection is made through a direct connection as shown here.

If the distance between the PC and controller is greater than 50 feet but less than 1.5 miles, a line driver or short haul modem can be used. Galaxy Control System can provide Black Box's SHMB-2 Short Haul Modem.

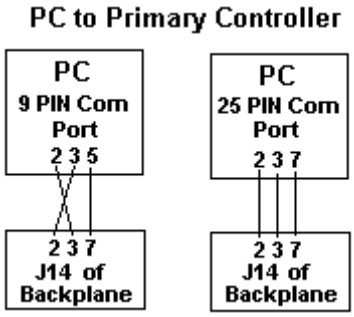


Figure 27

Dial up Connection

If the distance is too long or cable cannot be pulled between the locations, then external US Robotics Sportster Modems can be installed at the PC and the primary controller locations. The Primary can then be dialed and connected. This is the wiring configuration for a dial up scenario.

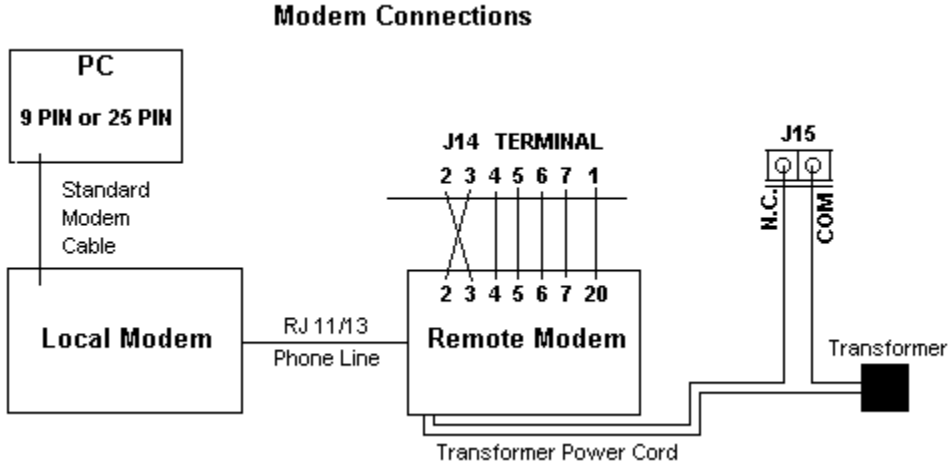
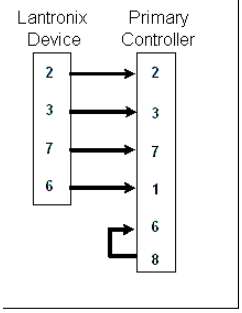


Figure 28

While at the controller location, be sure to record the Primary unit's serial number for system registration.

Each US Robotics Sportster modem must have switches 3, 5, and 8 in the ON position and all other switches must be OFF. Place Option switch 3 on the Satellite CPU board in the up position to enable dial up.

TCP/IP Connection



When connecting to the PC from the Primary Controller using TCP/IP, a Lantronix device is used. The Lantronix device is attached to the TCP/IP Network (LAN/WAN), then to the primary controller's J14 connector. This diagram shows the Lantronix-to-Primary controller connections.

See the "Lantronix Configuration" for instructions on configuring the device (p. 42).

Power Connections

The controller requires a +12 volt battery-backed DC power supply with a minimum 2 ampere continuous output. These power supplies come with the Satellite unit and should actually put out 13.8 VDC under load. The supply's output must be filtered and electronically regulated. It should also have a built in battery charger and should automatically switch to the battery when an AC failure occurs.

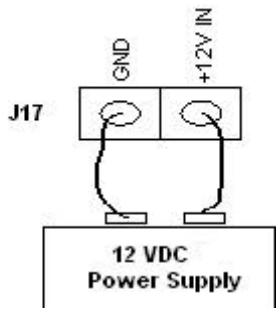


Figure 29

System Power is applied between Pins 1 and 2 of J17. The Processor Board is silk-screened with GND and +12V IN respectively. If power supplies from Galaxy Control System are not used, it is recommended that one with a battery backup be used. This will allow the system to continue to operate for some time even after AC power is lost. The power supply should also have a voltage ripple less than 2 millivolts.

The controller power supply provides power for the control unit, readers, and Input/Output ports only.

A separate power supply must be used to power the door strikes and magnetic locks.

Lantronix Configuration

The **Lantronix device** is an Internet communication device that converts Ethernet format data to RS-232 format data. This allows Galaxy controllers to be connected to their supporting PC via an Ethernet connection (such as a LAN/WAN), or to connect to each other over a Network Bridge created by two Lantronix devices (one at the Extending Secondary and one at the Remote Primary).

The Lantronix device is available in three models: **MSS100**, **MSS1** and **MSS1T2**.

MSS100

- supports up to 100Mb network connections

MSS1/ MSS1T2

- supports up to 10Mb network connections (T2 version has coax adapter)

Setup for any model can be accomplished using either **EZWebCon** or **Hyperterminal**.

EZWebCon

- allows you to plug the device into any available Ethernet port
- provides a user-friendly graphical interface for the configuration

Hyperterminal

- generally more reliable than EZWebCon
- requires a special cable between the device and setup PC (sent with devices)
- does not have any graphical interface (you must type the commands in directly)

Galaxy recommends attempting the configuration with **EZWebCon** first, using **Hyperterminal** as a backup method.

Setup for MSS100 (100Mb systems)

The MSS100 model supports 100Mb Ethernet (LAN/WAN) connections. It is the smaller, newer model. It can be configured using EZWebCon or Hyperterminal.

Using EZWebCon

Included with your Lantronix device is a CD and a 3.5" floppy.

The 3.5" floppy contains pre-configured setup files for the various types of configurations and Lantronix models used with Galaxy systems.

1. Use the CD to **install EZWebCon on the PC**.

2. Note the **Hardware address** on back of the Lantronix device.
   For example: 00.80.a3.21.5f.63

3. Connect the device to an **Ethernet port**.

4. Open **EZWebCon**. (Start button >> Programs >> EZWebCon)

5. Click on the **Lantronix box** in the lower left had corner to open the menu.

6. Click on **Assign IP address to server**.

7. Enter the **Hardware address** from the back of the device and **the IP address and subnet address** (as provided by the local IT department).

8. Click **OK**.

9. You will be prompted to **reboot** the Lantronix device. To do this, unplug the device from the power source, then plug it back in.

10. Click on **Micro-Serial Servers** in the EZWebCon window.

11. Enter the IP address for the device (same as previous).

12. Click **OK**.

13. On the next screen, scroll down and click on **Download Configuration to server**.

14. Insert the **3.5" floppy disk** provided with the device into the drive of the PC.

15. Browse to one of the following files on that disk:

<u>If Device will be used for Ethernet (TCP/IP) connections to loop:</u>
PC to Primary connection using MSS100 **../IP Connect/MSS100.cfg**

<u>If Device will be used for Network Bridges:</u>
Extending secondary using MSS100 **../RS232 Bridge/MSS100/ExtSec.cfg**
Remote Primary using MSS100 **../RS232 Bridge/MSS100/RemPri.cfg**

16. **Highlight** the file and click **Open**.

17. Select **NO** when prompted to download the IP address.

18. Click **OK** to reboot the device to save the configuration.

Using Hyperterminal

1. Connect the MSS100 to the Serial port of the configuring PC using the special cable included with the device. The cable provides the following connections:

MSS100 DB-25	**PC Serial Port**	
	9 Pin	25 Pin
2	2	3
3	3	2
7	5	7

2. Start Hyperterminal. It is usually found at **Start button >> Programs >> Accessories >> Hyperterminal**.

   If it is not available, you can add it using Add/Remove Programs in the Control Panel.

3. Once Hyperterminal opens, enter a **name for your connection** and select an **icon**.

4. In the Connect To window, select the **COM port** to which the cable is connected.

5. Click **OK.**

6. In the **COM Port Properties**, use the following settings:

Bits per second	**9600**
Data bits	**8**
Parity	**None**
Stop bits	**1**
Flow Control	**None**

7. Click **OK**.

8. Cold reset the device:

   - Unplug the device from the power source.
   - Press and hold the reset button (usually requires an unbent paper clip).
   - Still holding the reset button, plug in the device to the power source.
   - Continue to hold the reset button until the Local prompt is displayed.

9. Type in **SET PRIV** and press the enter key.
   This sets the privilege level so configuration commands can be issued.

10. Type in **SYSTEM** as the password and press the enter key.

11. The IP configuration will now be set.
    Type **CHANGE IPADDRESS ###.###.###.###** (###.###.###.### = the IP address) and press the enter key..

    The IP address must be assigned by the facility's network administrator to fit into the facility's address scheme. Otherwise the communication will not work.

After an IP address is assigned, you may continue the configuration from the PC, or you may connect the device to the network and Telnet to port #23 of the device.

12. Type **CHANGE FLOW CONTROL NONE** to disable all flow control, and press the enter key.

13. Type **CHANGE GATEWAY nnn.nnn.nnn.nnn** (nnn.nnn.nnn.nnn = the gateway), and press the enter key.

    This allow access from the Internet or from a different sub-net to which the device is connected. The facility's valid Gateway must be used. Contact the Facility's Manager of Information Systems to obtain this information.

14. Type the following commands, and press the enter key after each line:

    CHANGE BOOTP DISABLED
    CHANGE RARP DISABLED
    CHANGE SUBNET MASK mmm.mmm.mmm.mmm (mmm.mmm.mmm.mmm = the subnet mask); Contact the MIS department to obtain this information.

15. If the device is being used for a network bridge, follow these instructions. If the device is being used for an Ethernet (TCP/IP) connection between a PC and Primary controller, skip this step and continue at step 16.

    <u>For the extending secondary, follow these instructions</u>

    - Type **CHANGE DEDICATED TCP nnn.nnn.nnn.nnn:3001T**. (nnn.nnn.nnn.nnn = IP address of the remote primary) and press the enter key.
    - Type **CHANGE AUTOSTART ENABLED** and press the enter key.
    - **Set Option switch 5 on the controller in the up position.**

    <u>For the remote primary, follow this set of instructions</u>

    - Type **CHANGE ACCESS REMOTE** and press the enter key. This disables the local port for configuration after this connection is terminated.
    - **Set Option switch 6 on the controller in the up position.**

16. To change the baud rate of the device, type **CHANGE SPEED ####** (#### equals either 9600, 4800, or 2400 - this baud rate must match the setting of the Satellite CPU) and press the enter key.

17. End the PC connection and remove the special cable (if still connected).

18. Connect the Lantronix to the Satellite controller using the following wiring diagram.

J14 Back Plane DB-8Connector	2	3	7	6	1
			to pin		
Lantronix MSS100 DB-25 Connector	2	3	7	20	6

You must test the connection for either the PC to Primary connection (for TCP/IP loop connections) or the Extending Secondary to Remote Primary connection (for Network bridges) after the controllers have been added to the database.

Contact **Galaxy**'s Technical support department with any question.

Setup for MSS1/MSS1T2 (10Mb systems)

The MSS1/MSS1T2 models support 10Mb Ethernet (LAN/WAN) connections (MSS1T2 has a coax adapter). They can be configured using EZWebCon or Hyperterminal.

Using EZWebCon

Included with your Lantronix device is a CD and a 3.5" floppy.

The 3.5" floppy contains pre-configured setup files for the various types of configurations and Lantronix models used with Galaxy systems.

1. Use the CD to **install EZWebCon on the PC**.

2. Note the **Hardware address** on back of the Lantronix device.
   For example: 00.80.a3.21.5f.63

3. Connect the device to an **Ethernet port**.

4. Open **EZWebCon**. (Start button >> Programs >> EZWebCon)

5. Click on the **Lantronix box** in the lower left had corner to open the menu.

6. Click on **Assign IP address to server**.

7. Enter the **Hardware address** from the back of the device and **the IP address and subnet address** (as provided by the local IT department).

8. Click **OK**.

9. You will be prompted to **reboot** the Lantronix device. To do this, unplug the device from the power source, then plug it back in.

10. Click on **Micro-Serial Servers** in the EZWebCon window.

11. Enter the IP address for the device (same as previous).

12. Click **OK**.

13. On the next screen, scroll down and click on **Download Configuration to server**.

14. Insert the **3.5" floppy disk** provided with the device into the drive of the PC.

15. Browse to one of the following files on that disk:

<u>If Device will be used for Ethernet (TCP/IP) connections to loop:</u>
PC to Primary connection using MSS1 **../IP Connect/MSS1.cfg**
PC to Primary connection using MSS1T2 **../IP Connect/MSS1T2.cfg**

<u>If Device will be used for Network Bridges:</u>
Extending secondary using MSS1 **../RS232 Bridge/MSS1/ExtSec.cfg**
Remote Primary using MSS1 **../RS232 Bridge/MSS1/RemPri.cfg**

16. **Highlight** the file and click **Open**.

17. Select **NO** when prompted to download the IP address.

18. Click **OK** to reboot the device to save the configuration.

Using Hyperterminal

1. Connect the MSS1 to the Serial port of the configuring PC using the special cable included with the device. The cable provides the following connections:

MSS1/MSS1T2 DB-25	PC Serial Port	
	9 Pin	25 Pin
2	2	3
3	3	2
7	5	7

2. Start Hyperterminal. It is usually found at **Start button >> Programs >> Accessories >> Hyperterminal**.

   If it is not available, you can add it using Add/Remove Programs in the Control Panel.

3. Once Hyperterminal opens, enter a **name for your connection** and select an **icon**.

4. In the Connect To window, select the **COM port** to which the cable is connected.

5. Click **OK.**

6. In the **COM Port Properties**, use the following settings:

Bits per second	**9600**
Data bits	**8**
Parity	**None**
Stop bits	**1**
Flow Control	**None**

7. Click **OK**.

8. Cold reset the device:

   - Unplug the device from the power source.
   - Press and hold the reset button (usually requires an unbent paper clip).
   - Still holding the reset button, plug in the device to the power source.
   - Continue to hold the reset button until the Username prompt is displayed.

9. At the Username> prompt, log in using any name. A Local prompt should then appear.

10. Type in **SET PRIV** and press the enter key.
    This sets the privilege level so configuration commands can be issued.

11. Type in **SYSTEM** as the password and press the enter key.

12. The IP configuration will now be set.
    Type **CHANGE IPADDRESS ###.###.###.###** (###.###.###.### = the IP address) and press the enter key.

    The IP address must be assigned by the facility's network administrator to fit into the facility's address scheme. Otherwise the communication will not work.

After an IP address is assigned, you may continue the configuration from the PC, or you may connect the device to the network and Telnet to port #23 of the device.

13. Type **CHANGE FLOW CONTROL NONE** to disable all flow control, and press the enter key.

14. Type **CHANGE GATEWAY nnn.nnn.nnn.nnn** (nnn.nnn.nnn.nnn = the gateway) and press the enter key.

    This allow access from the Internet or from a different sub-net to which the device is connected. The facility's valid Gateway must be used. Contact the Facility's Manager of Information Systems to obtain this information.

15. Type the following commands, and press the enter key after each line:

    CHANGE BOOTP DISABLED
    CHANGE RARP DISABLED
    CHANGE SUBNET MASK mmm.mmm.mmm.mmm (mmm.mmm.mmm.mmm = the subnet mask); Contact the MIS department to obtain this information.

16. If the device is being used for a network bridge, follow these instructions. If the device is being used for an Ethernet (TCP/IP) connection between a PC and Primary controller, skip this step and continue at step 16.

    <u>For the extending secondary, follow these instructions</u>

    - Type **CHANGE DEDICATED TCP nnn.nnn.nnn.nnn:3001T** and press the enter key. (nnn.nnn.nnn.nnn = IP address of the remote primary).
    - Type **CHANGE AUTOSTART ENABLED** and press the enter key.
    - **Set Option switch 5 on the controller in the up position.**

    <u>For the remote primary, follow this set of instructions</u>

    - Type **CHANGE ACCESS REMOTE** and press the enter key. This disables the local port for configuration after this connection is terminated.
    - **Set Option switch 6 on the controller in the up position.**

17. To change the baud rate of the device, type **CHANGE SPEED ####** (#### equals either 9600, 4800, or 2400 - this baud rate must match the setting of the Satellite CPU) and press the enter key.

18. End the PC connection and remove the special cable (if still connected).

19. Connect the Lantronix to the **Satellite** controller using the following wiring diagram.

J15 Back Plane DB-25 Connector	2	3	7	6	20
			to pin		
Lantronix MSS1/1T2 DB-25 Connector	2	3	7	20	6

You must test the connection for either the PC to Primary connection (for TCP/IP loop connections) or the Extending Secondary to Remote Primary connection (for Network bridges) after the controllers have been added to the database.

Contact **Galaxy**'s Technical support department with any question.

J16 Connector

The AC Failure and Low Battery connections on the J16 Connector allow the unit's power status to be monitored by the **Satellite**'s software. The Tamper connection connects to an enclosure Tamper switch. The Low Battery, AC Fail, and Tamper must all be Normally Closed dry inputs to report safe conditions.

Appendix

Unit Number Table

0 = Switch Down
1 = Switch Up

Switch #	1	2	3	4	5	6	7	8
Value	1	2	4	8	16	32	64	128
Unit #								
00	0	0	0	0	0	0	0	0
01	1	0	0	0	0	0	0	0
02	0	1	0	0	0	0	0	0
03	1	1	0	0	0	0	0	0
04	0	0	1	0	0	0	0	0
05	1	0	1	0	0	0	0	0
06	0	1	1	0	0	0	0	0
07	1	1	1	0	0	0	0	0
08	0	0	0	1	0	0	0	0
09	1	0	0	1	0	0	0	0
10	0	1	0	1	0	0	0	0
11	1	1	0	1	0	0	0	0
12	0	0	1	1	0	0	0	0
13	1	0	1	1	0	0	0	0
14	0	1	1	1	0	0	0	0
15	1	1	1	1	0	0	0	0
16	0	0	0	0	1	0	0	0
17	1	0	0	0	1	0	0	0
18	0	1	0	0	1	0	0	0
19	1	1	0	0	1	0	0	0
20	0	0	1	0	1	0	0	0
21	1	0	1	0	1	0	0	0
22	0	1	1	0	1	0	0	0
23	1	1	1	0	1	0	0	0
24	0	0	0	1	1	0	0	0
25	1	0	0	1	1	0	0	0
26	0	1	0	1	1	0	0	0
27	1	1	0	1	1	0	0	0

Switch #	1	2	3	4	5	6	7	8
Value	1	2	4	8	16	32	64	128
Unit #								
28	0	0	1	1	1	0	0	0
29	1	0	1	1	1	0	0	0
30	0	1	1	1	1	0	0	0
31	1	1	1	1	1	0	0	0
32	0	0	0	0	0	1	0	0
33	1	0	0	0	0	1	0	0
34	0	1	0	0	0	1	0	0
35	1	1	0	0	0	1	0	0
36	0	0	1	0	0	1	0	0
37	1	0	1	0	0	1	0	0
38	0	1	1	0	0	1	0	0
39	1	1	1	0	0	1	0	0
40	0	0	0	1	0	1	0	0
41	1	0	0	1	0	1	0	0
42	0	1	0	1	0	1	0	0
43	1	1	0	1	0	1	0	0
44	0	0	1	1	0	1	0	0
45	1	0	1	1	0	1	0	0
46	0	1	1	1	0	1	0	0
47	1	1	1	1	0	1	0	0
48	0	0	0	0	1	1	1	0
49	1	0	0	0	1	1	0	0
50	0	1	0	0	1	1	0	0
51	1	1	0	0	1	1	0	0
52	0	0	1	0	1	1	0	0
53	1	0	1	0	1	1	0	0
54	0	1	1	0	1	1	0	0
55	1	1	1	0	1	1	0	0
56	0	0	0	1	1	1	0	0
57	1	0	0	1	1	1	0	0
58	0	1	0	1	1	1	0	0
59	1	1	0	1	1	1	0	0
60	0	0	1	1	1	1	0	0
61	1	0	1	1	1	1	0	0
62	0	1	1	1	1	1	0	0
63	1	1	1	1	1	1	0	0
64	0	0	0	0	0	0	1	0
65	1	0	0	0	0	0	1	0
66	0	1	0	0	0	0	1	0
67	1	1	0	0	0	0	1	0
68	0	0	1	0	0	0	1	0
69	1	0	1	0	0	0	1	0
70	0	1	1	0	0	0	1	0
71	1	1	1	0	0	0	1	0
72	0	0	0	1	0	0	1	0

Switch #	1	2	3	4	5	6	7	8
Value	1	2	4	8	16	32	64	128
Unit #								
73	1	0	0	1	0	0	1	0
74	0	1	0	1	0	0	1	0
75	1	1	0	1	0	0	1	0
76	0	0	1	1	0	0	1	0
77	1	0	1	1	0	0	1	0
78	0	1	1	1	0	0	1	0
79	1	1	1	1	0	0	1	0
80	0	0	0	0	1	0	1	0
81	1	0	0	0	1	0	1	0
82	0	1	0	0	1	0	0	0
83	1	1	0	0	1	0	1	0
84	0	0	1	0	1	0	1	0
85	1	0	1	0	1	0	1	0
86	0	1	1	0	1	0	1	0
87	1	1	1	0	1	0	1	0
88	0	0	0	1	1	0	1	0
89	1	0	0	1	1	0	1	0
90	0	1	0	1	1	0	1	0
91	1	1	0	1	1	0	1	0
92	0	0	1	1	1	0	1	0
93	1	0	1	1	1	0	1	0
94	0	1	1	1	1	0	1	0
95	1	1	1	1	1	0	1	0
96	0	0	0	0	0	1	1	0
97	1	0	0	0	0	1	1	0
98	0	1	0	0	0	1	1	0
99	1	1	0	0	0	1	1	0