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Brivo ACS Installation Guide

August 2001

NOTICE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation or when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, wich can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- **Reorient or relocate the receiving antennae.**
- **Increase the separation between the equipment and receiver.**
- **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.**
- **Consult the dealer or an experienced radio/TV technician for help.**

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Brivo™ ACS Installation Guide

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Introduction

Access Control is the control through electronic methods over entry to any area that can be secured with a lock and key. Only individuals who are authorized will be granted entry at authorized times. Control of who is allowed to come and go is easily maintained through a central administration panel.

The common key is the weakness of the lock and key system. The key is a readily duplicated piece of metal that gives anyone who holds it access to area. With the Brivo™ Access Control System (ACS), the weakness of the lock and key system is overcome through the use of five-digit PIN codes, called “keycodes.” The keycodes are entered by authorized individuals at the Brivo keypad and the individuals are then granted access to the secure area. If a keycode is compromised, the account administrator can disable it immediately and assign a new code to the individual.

An additional benefit of access control is access data archiving capability. The Brivo ACS provides real-time visibility of keycode activity and maintains a record of all entries to an area. This record is provided to the account holder quarterly and accessible to authorized personnel at the Brivo ACS website until archived.

The Brivo ACS Installation Guide provides all information necessary for installation of the Brivo ACS-2000 and ACS-2100 keypad and control panel.

Parts List

Box 1

- ACS Control Panel
- Magnetic Door Sensor

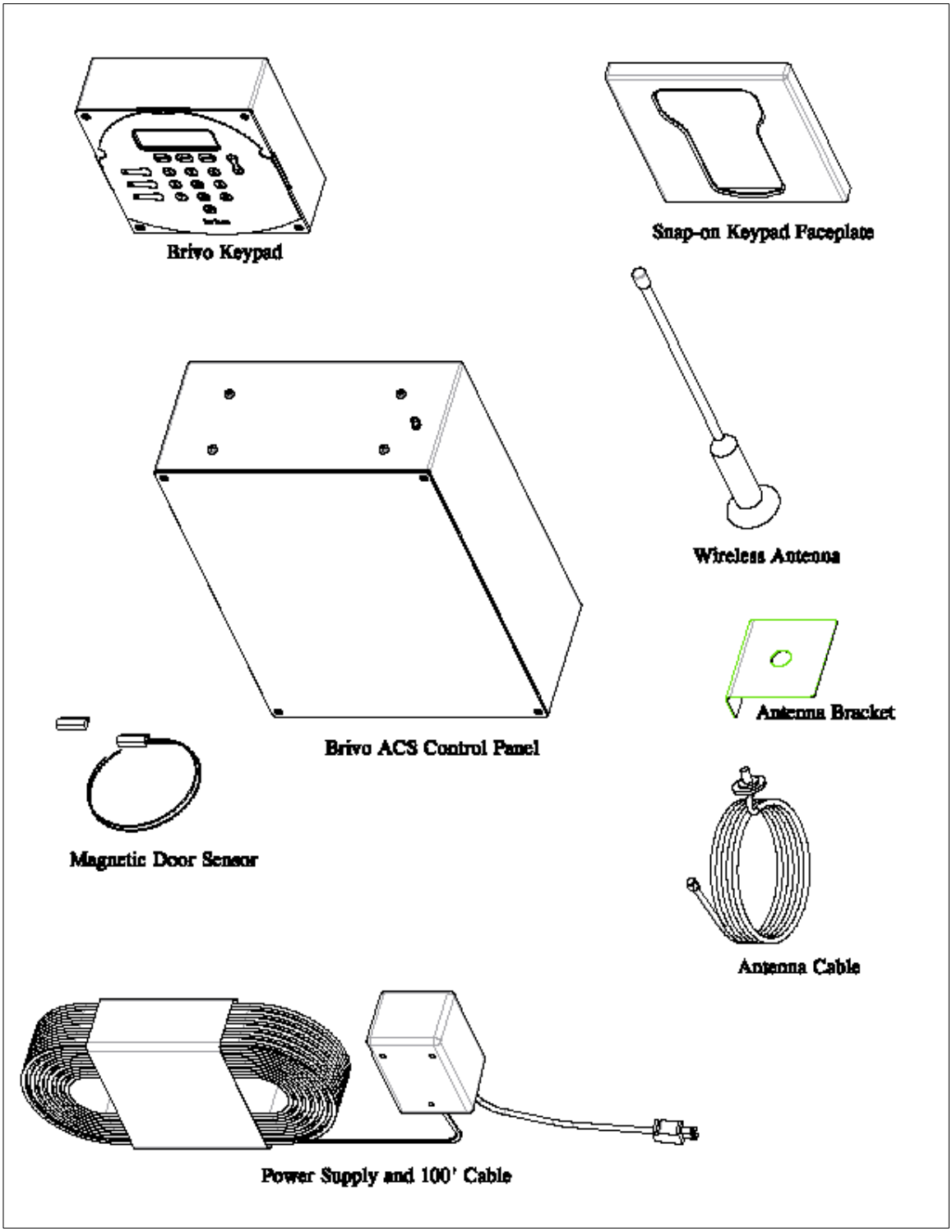
Box 2

- Keypad
- Cutout template for flush mounting
- Snap-on keypad faceplate
- Antenna kit (boxed separately within this box)
- Power Supply (boxed separately within this box)
- Installation Worksheet

Supplied by Installer

- Five CAT 5 cables, maximum length of 20 feet
- Ten CAT 5 connector plugs to terminate onto cables
- Necessary conduit and conduit fittings if desired, maximum size ¾”
- Ten mounting screws (#6 wood screws or Molly bolts)

Diagram: Components List



SAFTEY WARNINGS

Fire Safety Notice: Never connect the Brivo keypad or locks to doors without first consulting the applicable fire code. You must consult with and get approval of, local fire officials before installing locks or devices on any doors that may be fire exits. Use of egress push buttons may not be legal. Single action exit may be required. Always obtain proper permits and approvals in writing before installing equipment.

FCC RF Exposure Notice: To meet the FCC RF exposure requirement for mobile transmitter end products using the Austin 200160 500C, 0 dBd antenna, ensure that the antenna is at least 20cm (8”) away from the user or nearby persons when transmitting.

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Installation Steps

General Site Survey

The Brivo Access Control System has two major components to be installed -- the keypad and the ACS Control Panel. Both components work in concert with one another and require cabling between them. A general site survey should occur before any installation work to identify suitable mounting essentials and potential hazards.

Ideal conditions to look for include:

1) A stud near the keypad location on the wall. Ideally, the keypad casing should have two screws fastened to a stud. The keypad can be mounted using Molly bolts if no stud is available.

2) A suitable mounting area for the ACS Control Panel within 15 feet of the keypad. The control panel can be mounted on a wall or in the ceiling. Like the keypad, the control panel ideally should be fastened to a stud.

3) A suitable place to mount the ACS Antenna within 15 feet of the ACS Control Panel mounting area. The antenna must be mounted either right-side up or upside down, it should not be mounted on its side and should be at least three feet away from human contact.

4) A 120 V power outlet within 100 feet of the control panel mounting area. The ACS Control Panel requires electrical power.

5) The control panel should be located within 50 feet of the door latch.

Pre-Installation

After location has been determined:

1) Select length of CAT-5 cable required

2) Mark both ends of each cable with A, B, C, D, or E

3) Route cables (through a conduit or individually) through the walls in desired manner. Note that the cables eventually will be fed through knocked out holes in the keypad casing and the control panel.

   Do not terminate the cables with the RJ45 plugs at this time!

Keypad

Flush (Recessed) Installation vs. Surface Installation

The decision to mount on the surface or flush must occur before you determine which of the four holes should be knocked out within the keypad casing. (See Step 2 in “Mounting the Keypad” section). The keypad should be mounted in a location no more than 48 inches from the floor.

The keypad can be installed flush against the wall by cutting into the wall and inserting a portion of the keypad casing behind the surface. This will give a more streamlined appearance of the keypad on the wall.

The keypad can also be installed on the surface of the wall, which requires minimal cutting into the wall. The keypad can be installed on the surface of the wall with #6 wood screws if a stud is available or anchor (Molly) bolts if no stud is used.

Installation of the ACS Keypad

Mounting the Keypad – Flush Mount

1. After determining to go with the **flush** mount for the keypad, unscrew the four surface screws on the front of keypad. The keypad casing will remain open during the most of the mounting of the keypad.

2. Determine the location for mounting the keypad. The optimal location will allow for the keypad casing to be mounted directly to a stud through either the right or left side. Based on the location of the stud, knockout the 1" hole on the opposite side or the hole on the bottom surface of the box, if preferred for ease of cable routing.

3. Locate the supplied cutout template. Trace around the template in the area of the wall on which you'd like to mount the keypad.

4. Cut around the marking through the wall to a depth of at least 2 ½", exposing the stud to which you will fasten the keypad casing.

5. Locate the five CAT5 cables and pull each through the knocked out hole in the keypad casing. Use a ¾" conduit connector if required.

6. Mount the side of the keypad box to the stud, using two #6 woodscrews.

7. Terminate each cable with an RJ45 plug.

8. Connect the cables to the jacks on the jumper board located within the keypad casing. (See diagram, *Brivo keypad converter board)*. Cable "A" should be plugged into jack "A", etc.

9. Locate the lid of keypad casing. On the back of the lid, you will see the back of the LCD display. Locate the cable that is connected to it and plug it into the 16-position header on the keypad jumper board, designator J20. (See diagram, *Brivo keypad converter board*, and diagram, *Keypad casing lid*)

10. Locate the fiber optic tail on the lid of the keypad casing. Plug the cable into the LED in the D3 position on the keypad jumper board. (See diagram, *Brivo keypad converter board*, and diagram, *Keypad casing lid*)

11. Locate the ribbon cable on the lid on the keypad. Plug it into the 11-position connector and position J23 on the keypad jumper board. (See

diagram, *Brivo keypad converter board*, and diagram, *Keypad casing lid*). After inserting the ribbon cable in J23, snap down the two-piece connector to lock in the cable.

12. Screw the lid onto the keypad box with the four flat-head #6 screws that are provided.

13. The Brivo keypad is now fully assembled except for the attachable keypad faceplate. DO NOT SNAP THE FACEPLATE ON UNTIL ALL FUNCTIONAL TESTING IS COMPLETE.

Mounting the Keypad – Surface Mount

1. After determining to go with the **surface** mount for the keypad, unscrew the four surface screws on the front of keypad. The keypad casing will remain open during the most of the mounting of the keypad.

2. The cables will exit the keypad casing in the back of the box. Knockout the conduit hole in the back of the keypad casing.

3. Determine a suitable place on the wall to surface mount the keypad. Cut out a 1.5" diameter hole in the wall at the approximate location of the conduit hole on the back of the keypad casing. Pull the cables through the conduit hole, use a ¾" conduit connector if necessary.

4. Mount the keypad casing with four #6 screws, using the countersunk holes. It is ideal to fasten the keypad casing to a stud. If one is not available for a surface mount, the keypad casing can be mounted with four anchor (Molly) bolts.

5. Terminate each cable with an RJ45 plug.

6. Connect the cables to the jacks on the jumper board located within the keypad casing. (Refer to diagram, *Brivo keypad converter board*). Cable "A" should be plugged into jack "A", etc.

7. Locate the lid of keypad casing. On the back of the lid, you will see the back of the LCD display. Locate the cable that is connected to it and plug it into the 16-position header on the keypad jumper board, designator J20. (See diagram, *Brivo keypad converter board*, and diagram, *Keypad casing lid*).

8. Locate the fiber optic tail on the lid of the keypad casing. Plug the cable into the LED in the D3 position on the keypad jumper board. (See diagram, *Brivo keypad converter board*, and diagram, *Keypad casing lid*).

9. Locate the ribbon cable on the lid on the keypad. Plug it into the 11-position connector and position J23 on the keypad jumper board. (See diagram, *Brivo keypad converter board*, and diagram, *Keypad casing lid*). After inserting the ribbon cable in J23, snap down the two-piece connector to lock in the cable.

10. Screw the lid onto the keypad box with the four flat-head #6 screws that are provided.

11. The Brivo keypad is now fully assembled except for the attachable keypad faceplate. DO NOT SNAP THE FACEPLATE ON UNTIL ALL FUNCTIONAL TESTING IS COMPLETE.

Diagram: Keypad Casing Lid

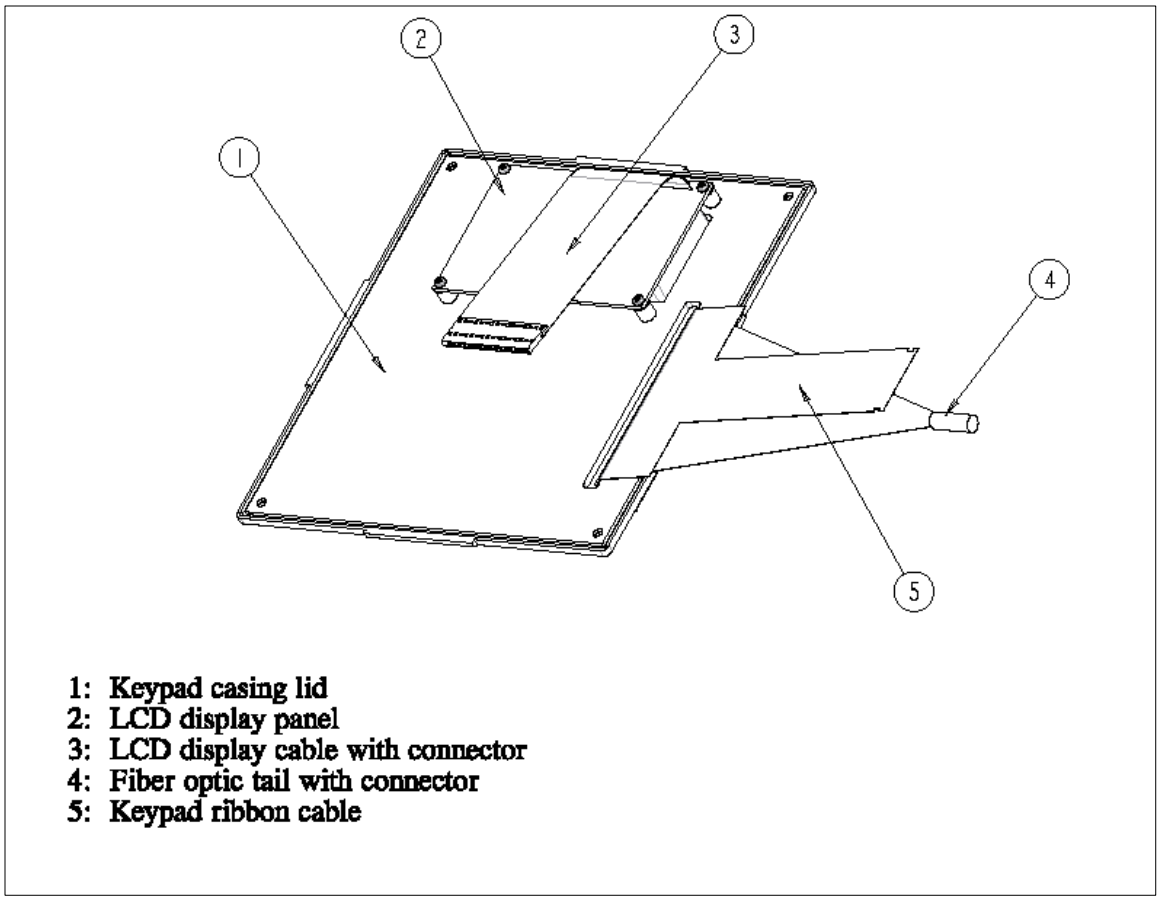
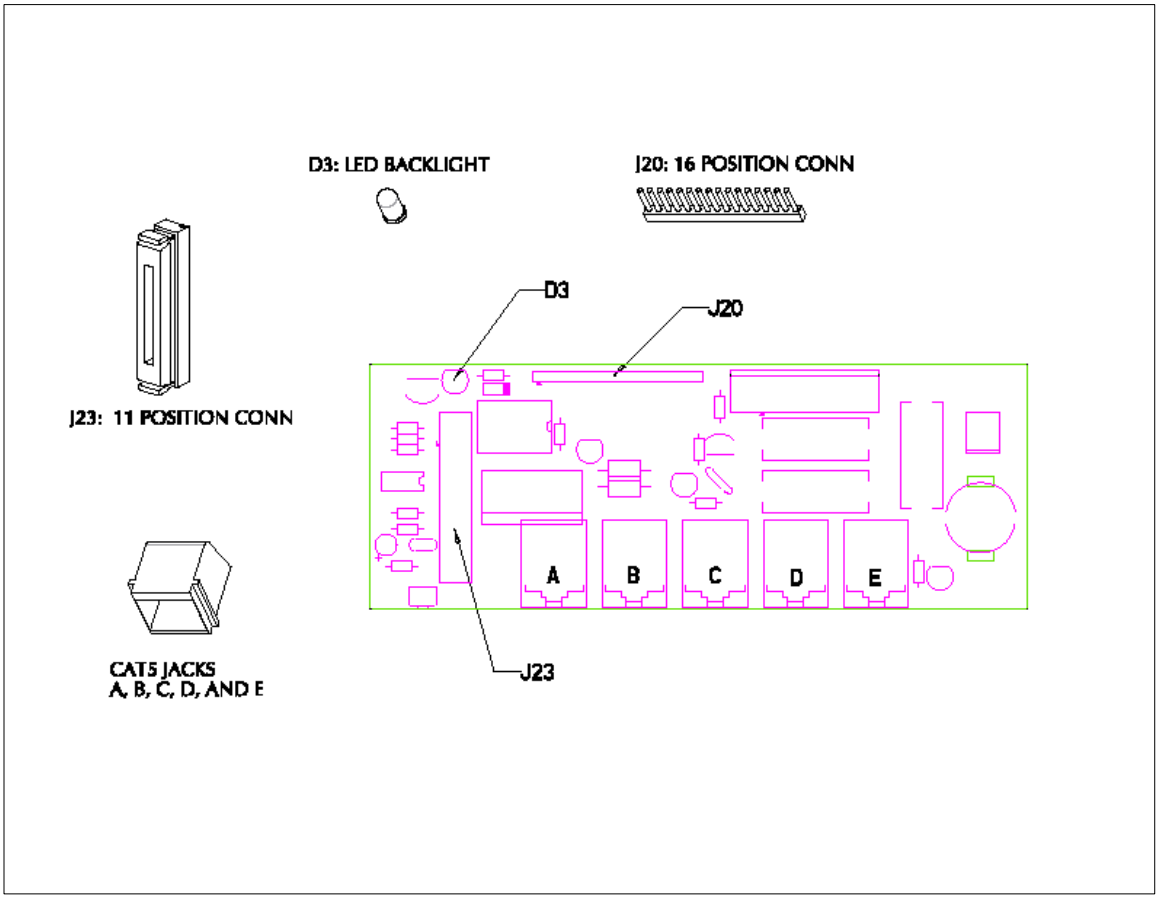


Diagram: Keypad Converter Board



Installation of ACS Control Panel

Mounting the Control Panel

1. Locate the control panel. Unscrew the four corner screws and remove the lid of the control panel casing.

2. Note the location where you want to mount the control panel. The control panel can be mounted on a wall or in the ceiling.

3. Locate the five CAT5 cables and pull them through the larger hole in the bottom of the control panel casing. Use a ¾'' conduit connector on the larger hole, if necessary.

4. Mount the control panel casing to the wall, using four #6 screws. It is ideal to fasten the control box to a stud. If one is not available, the control box can be mounted with four anchor (Molly) bolts. If mounting in the ceiling, locate a stud and fasten the control panel casing to it.

5. After mounting the control panel casing to the wall or in the ceiling, terminate the cables to RJ45 plugs and plug them into the control panel jumper board in their proper positions, cable "A" plugs into jack "A", etc. (See diagram, *Control panel converter board*). Do not replace the lid of the control panel casing yet.

6. Locate the magnetic switch and install it in a convenient place over the door, following the manufacturer's instructions. The magnet (piece with no wires) should be attached to the door and the switch (contains two wires) to the doorframe above the door. Screws are provided to securely fasten both pieces of the switch.

7. Attach two, 26-22 gauge wires (provided by installer) to the magnetic door sensor and route them to the Control Panel. Pull the two wires into the control panel casing through the smaller hole. The wires will be used to sense the door open/close status. (See diagram, *Control panel converter board*).

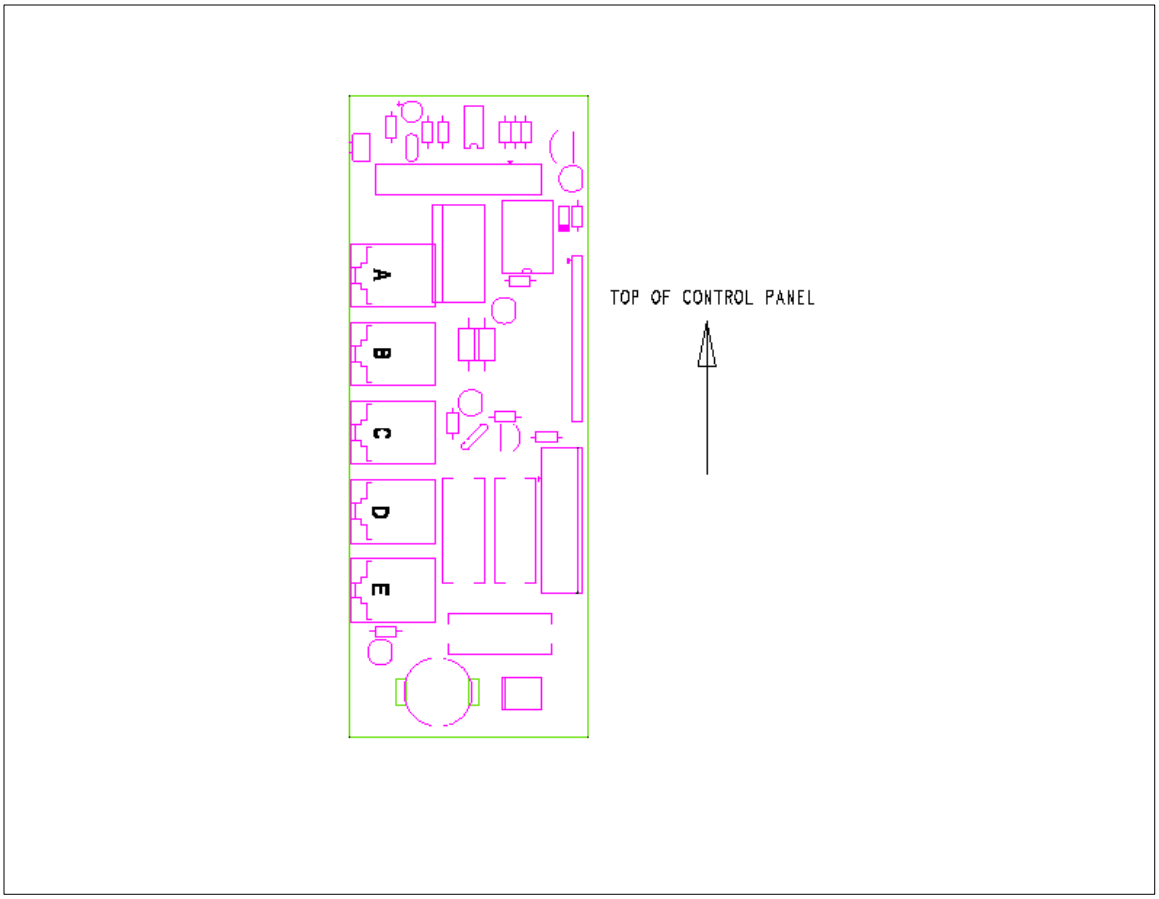
8. Locate the black and yellow wires inside the control panel jumper board. Use an appropriate connector to connect the wires from the magnetic switch to the black and yellow wires. (See diagram, *Control panel converter board*).

9. Locate the orange, blue and green wires inside the control panel jumper board. The three contacts are connected to a SPST relay.

The blue wire is connected to the common contact, orange wire is connected to the normally open contact and green wire is connected to the normally closed contact.

10. Pull the two wires into the control panel casing through the smaller hole. The wires will be used to control the door latch via the relay output. (See diagram, *Control panel jumper board*).

Diagram: Control Panel Converter Board



Installation of the ACS Power Supply

Mounting the Power Supply

1. Locate the power supply kit. Note that the power supply will be plugged into a 120 volt AC socket. Mount the power supply to the wall an appropriate distance from the outlet, using anchor bolts.

2. There will be 100 feet of cable. **WARNING!** Do not plug the power supply into the AC socket yet.

3. Dress the cable up the wall, route it to the control panel.

4. Pull the power cable through the smaller hole in the bottom of the control panel. Properly terminate the cable with the supplied terminals and install the 3-position connector housing onto the end of the cable.

5. Plug the terminated cable into the power connector on the control panel main board in the position designated J5. (See diagram, *Control Panel Main PC Board*).

6. Plug the power supply cable into the AC socket.

7. Locate the SW4 switch on the main control panel board and switch it “on”. If AC power is present the green LED marked AC/D4 located near the RJ45 jacks on the jumper board will be on. (See diagram, *Control Panel Main PC Board*).

8. Wait 5 minutes to allow the super capacitors to become fully charged.

Installation of the ACS Antenna

Mounting the Antenna and Performing Functional Testing

FCC RF Exposure Notice: To meet the FCC RF exposure requirement for mobile transmitter end products using the Austin 200160 500C, 0 dBd antenna, ensure that the antenna is at least 20cm (8") away from the user or nearby persons when transmitting.

1. Locate the antenna kit. In it you will find the antenna, the antenna mounting kit, and the mounting bracket.

2. Take the antenna and the mounting kit and screw them together through the 3/4'" hole in the antenna mounting bracket.

3. There is a jack originating on the top of the control panel casing. Plug the antenna cable into this jack.

4. Now you are ready to perform functional testing of the system. First, open the door and prop it open.

5. Return to the control panel and depress the "Reset" button, which is designated switch SW3. (See diagram, *Control Panel Main PC Board*).

6. Return to the keypad user interface and close the door. Press enter to start functional testing. The first screen is a character test. Verify all characters appear normal and press the down arrow to advance to the next screen.

7. The second screen is a pixel test. Verify that all the pixels rectangles are complete and press the down arrow to advance to the next screen.

8. The third screen is a keypad test. Press each button on the keypad and verify that the corresponding character is displayed. After every key is pressed, press the down arrow to advance to the next screen.

9. The fourth screen is the door sensor/ door open test. Press enter to test the door open mechanism and open the door. Verify the door open/close status on the screen as open. Close the door and verify the door open/close status as closed. Press enter to re-open the door and prop it open. Press the down arrow to advance to the next screen.

10. The fifth screen is the sensor test. Verify that primary power is available. Press the down arrow to advance to the next screen.

11. The sixth screen is the light sensor test. Press the up arrow, then the down arrow to advance to the next screen.

12. The seventh screen is the IR sensor test. Press the up arrow, then the down arrow to advance to the next screen.

13. The eighth screen provides the antenna signal strength. With the antenna oriented right side up or upside down, not on its side, find the best signal strength as indicated on the keypad display.

    NOTE: -50dbm is better than –100dbm. A reading of –256dbm indicates no signal is reaching the system.

14. Once you've found a suitable mounting place for the with the best signal strength, mount the antenna to the wall using two #6 screws. Now replace the front of the control panel using the four corner screws. Press the down arrow to advance to the next screen.

15. The ninth screen contains the door id# and ESN number. Record the door id # on the installation worksheet. Press the down arrow to complete the functional testing.

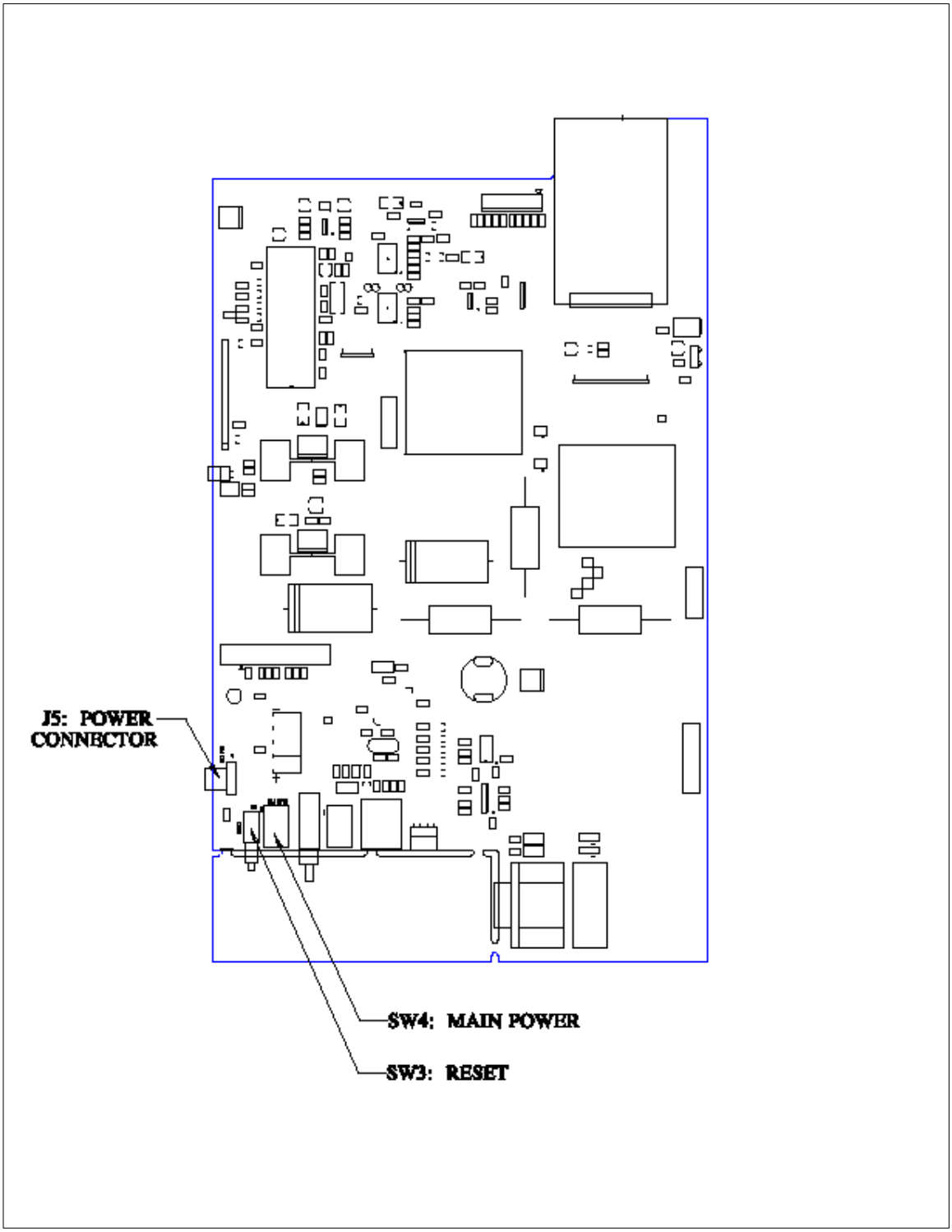
    NOTE: The BRN screen will now be displayed until the device is registered. Additional antenna adjustments can be made at this point by pressing enter to update the current signal strength.

16. Snap the keypad faceplate on the keypad unit.

17. Locate the *Installation Worksheet*. Complete the checklist on the worksheet, paying close attention to copying the Door ID number correctly, and deliver it to the customer.

18. Alert the customer that they can now register the door using the door ID # provided on the *Installation Worksheet.*

Diagram: Control Panel Main PC Board



Product Specifications

Models ACS-2000 & ACS-2100

Size

Keypad:	7.5” x 7.5” x 0.75” (flush mounted) 7.5” x 7.5” x 2.75” (surface mounted)
Control and Communication Panel:	14.25” x 10.75” x 5.25”

Electrical

Transformer Input:	120VAC, 60Hz, 1 Amp
Transformer Output:	12VAC, 44 Watts
Operating Temperature:	–20 to +70 degrees Celcius
Keypad:	Membrane with backlit LCD display
Output Relay Format:	NO, NC, Common contact set
Output Relay Ratings:	0.4Amp, 125VAC, 2Amp, 30VDC
Battery Backup:	6 “D Cell” Alkaline batteries (included)
Modem:	Rim R902M

Cable Types

Keypad to Control Panel:	Cat5 or Cat5E (5 cables)
Door Closed Monitor Switch:	2 conductor bell wire
Door Latch / Lock:	See Latch / Lock Manufacturer Data

Cable Lengths

Keypad to Control Panel:	20 feet maximum
Control Panel to Door Closed Switch:	60 feet maximum
Control Panel to Latch / Lock:	See Latch / Lock Manufacturer Data
Antenna Coax Cable (supplied):	15 feet maximum

Other

Clock:	Real-time clock
Color / Finish:	Keypad Bezel: Pantone, Dark Grey 433C / Suede Keypad Box: Pantone Black 2C / Suede Control Panel: Pantone Dark Grey 433C / Suede

Certifications
FCC and UL certifications are pending.

Specifications are subject to change without notice. Brivo reserves the right to discontinue any product without notice.

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