

# **Series 2001**

## **2150 Control Microprocessor Control**

For door operators with Version 2 Software and Encoder

## **Field Quick-Start Instructions and Common Questions and Answers**

# SERIES 2001 SLIDE DOOR OPERATOR

with C2150 Control and Version 2 Software

## SECTION 1: QUICK-START INSTRUCTIONS

To get this operator up and running, do the following:

1. Physically inspect the package you received.
  - a. The small red connector from the motor encoder should be plugged into connector CN1 on the control.
  - b. The motor should be plugged into connector CN8.
  - c. The close monitor switch assembly should be connected to terminal #10 and #11 of connector CN2, and should trip when the door is fully closed.
  - d. A five-conductor cable should run between connector CN7 and the power supply. The power supply should be a C3925 for 120VAC operation. For 240VAC, it should be a C3926 (with round "donut" transformer).
2. Check the incoming power for proper connections. Pin 1 of the power supply is to be wired to the HOT side of the AC line (normally black-US or brown-international). Pin 2 of the power supply is for the NEUTRAL side of the AC line (normally white-US or blue-international). Pin 3 of the power supply is frame ground (green-US or green/yellow-international).
3. If you do not plan to use the day/night mode, a jumper must be present between pins 15 and 16 of CN2, the main input connector. Also, a toggle switch or jumper wire must be present between pins 8 and 9 of connector CN2. This wiring is normally done for you at the factory.
4. Set reversing sensitivity pot R10 fully counter-clockwise. On Rev. E and later controls, set switch S5 to the EXT position, and verify that jumper blocks JB1A and JB1B are not installed. Do not wire any motion detectors or other accessory devices at this time (the factory pre-wired safety beams, if present, may be left in place).
5. **Caution**, door will move! Move the door manually to a position in mid-stroke. Insure that the toggle circuit is complete, and apply AC power to the door package.
  - a. The display should wink the version number in two parts (as in 2. then 11).
  - b. The display should indicate **FC** (for first run - Finding Close stop), and the door should fully close at slow speed. [If the door moves a short distance closed, then stops and the display indicates **Pd**, it means that the pre-wired safety beams are hanging the door up and preventing the "learn" cycle; the yellow SAF BEAM indicator will be lit in this case.]
  - c. When the door has fully closed, the yellow CLM (close monitor) indicator should come on. The display should show **ts** (total Stroke), followed by the stroke found (in inches). **Important note:** The stroke displayed should match the door stroke as installed, since each control is "taught" the stroke for the operator it ships in at the factory. If you need to change the stroke for any reason, refer to question 1-1 in Section 3, **COMMON QUESTIONS & ANSWERS**.
  - d. After the stroke displays, the display will switch to **dA** (dAyttime mode.) [If the display switches to something besides **dA** and the door refuses to do anything else, look at the green TOG SW indicator on the left side of the control. It should be on. If it's off, insure that the toggle switch is turned on, that switch S5 (on Rev. E and later controls) is set to the EXT position, and that the SO magnets, if present, are closing the breakout magnetic reed switches. These switches are connected in series with the toggle circuit.]
6. Depressing the DOWN button on the C2150 control will now actuate the door to open at the factory selected default settings for open speed, open check, braking, and time delay. Inspect for smooth operation, free of binds, excessive noise, etc.
7. If any speeds or other settings need to be changed, follow this procedure:
  - a. Turn the toggle switch (or switch S5, if present) OFF. The display will switch to the menu of adjustable parameters. In Version 2.10 & up, the right decimal point will also be blinking.
  - b. Refer to the chart on page H202.2 and scroll through the parameter list using the **UP** and **DOWN** buttons until you find the parameter you wish to change. When you've found it, press and hold the **SET** button. The display will now change to show the current value or setting of the parameter. While holding the **SET** button down, press or hold **UP** or **DOWN** to modify the setting. When the **SET** button is released, the display once again shows the parameter you just changed. You may then change another parameter, or turn the toggle circuit back on to check the change(s) you just made. The chart on page 3 also shows the factory default settings for each parameter.
8. If you changed any adjustments, after you are satisfied with all control settings, insure that the toggle circuit is ON. Press and hold the **SET** button on the control until **dS** (data Saved) displays. All of your settings are now stored in the control's memory. You must perform this step if you changed any settings, otherwise the control will go back to the factory default settings after a power failure!
9. Set the reversing sensitivity as desired using adjustment R10. Do NOT leave this adjustment at minimum!!
10. Install accessory devices and wire them to CN2. Check all detectors for proper operation.

This concludes the electrical installation and set-up.



The following chart shows all of the adjustable parameters for **Version 2** software. Refer to steps 7 and 8 on page H202.1 to make any necessary changes.

CODE	PARAMETER	FACTORY PRESET VALUE	ADJUSTS
OS	Open Speed	10	0-15
CS	Close Speed	12*	0-15
OC	Open Check	4	0-15
CC	Close Check	4	0-15
OU	Open cUshion	3	0-15
CU	Close cUshion	3	0-15
d1	delay time 1 (full)	1 sec	1-60**
d2	delay time 2 (partial)	1 sec	1-60**
AC		1 (set at factory - do not change)	
HO		3 (set at factory - do not change)	
rc		3 (set at factory - do not change)	
CP	open Check Point	75% of stroke	50-90% IS
PO	Partial Open position	8"	8"-15"
IS	total Stroke	(as determined by learn cycle)	12-199"
ct	cycle test	oF (no)	oF/on
AS	AutoSeal	oF (no)	oF/on
St	Stop OK on first run	on (yes)	oF/on
Hd	Heavy-duty door/motor	oF (no)	oF/on
PF	Power Fail	OP (power fail OPen)	OP/CL
Ob	Close braking	oF (no) (Version 2.03 & up only)	oF/on
br	brake on recycles	oF (no) (Version 2.03 & up only)	oF/on
LL	Lock present	oF (on if Horton lock is present)	oF/on
SA	Fail-SAFE lock	oF (fail-secure/on if fail-safe lock found)	oF/on
UL	Unmonitored Lock	oF (monitored lock)	oF/on
bl	bi-stable Lock	oF (standard lock)	oF/on
dl	daytime Lock	oF (don't lock in daytime)	oF/on
L1	daytime 1-way Lock	oF (Version 2.03 & up only)	oF/on
JS	Jam Sensing	on (Version 2.07 & up only)	oF/on
rP	reverse on encoder Pulses	on (Version 2.06 & up only)	oF/on
SP	Sidelite Protection	oF (Version 2.03 & up only)	oF/on
nA	no Adjustments permitted	oF (Version 2.05 & up only)	oF/on

\*Caution: very light doors may require a lower setting.

**Note:** In Versions 2.06 & prior, d1 and d2 adjust from 1-199 seconds in 1 second steps. Beginning with Version 2.07, these parameters may be set to 1-8, 10, 12, 14, 16, 20, 25, 30, or 60 seconds.

**Note:** A double dash (- -) is a reserved parameter that is not implemented.

## SECTION 2: OTHER DISPLAY CODES

(Version 2 software)

The following initialization, error, and diagnostic codes may also be displayed:

<b>≡≡</b>	Control is braking door.	<b>UF</b>	Unlock failure of automatic lock.
<b>dS</b>	Setup data stored.	<b>LF</b>	Lock failure of automatic lock.
<b>dA</b>	Day mode selected.	<b>EF</b>	Encoder failure.
<b>nt</b>	Night mode selected.	<b>LP</b>	Loss of pulses from encoder.
<b>PC</b>	Partial open check (when partial opening is activated).	<b>EP</b>	Encoder phasing wrong.
<b>nL</b>	No automatic lock found.	<b>Et</b>	Encoder test starting.
<b>SE</b>	Fail secure automatic lock found.	<b>oo</b>	Rotating lines during encoder test.
<b>SA</b>	Fail safe automatic lock found.	<b>SF</b>	Stroke determination failure.
<b>FC</b>	First run - finding fully closed position.	<b>dF</b>	Data storage failure.
<b>FO</b>	First run - finding fully open position.	<b>bF</b>	Battery failure (when optional battery pack is installed).
<b>J1</b>	Jam sensed - door not moving at beginning of open or close cycle.	<b>PF</b>	Power failure detected.
<b>Pd</b>	Pedestrian stopping initialization.	<b>OP</b>	Door opening following detection of power failure.
<b>nS</b>	No close monitor microswitch found when expected.	<b>CL</b>	Door closing following detection of power failure.



## SECTION 3: COMMON QUESTIONS & ANSWERS

(Version 2 software)

### \*\*\* QUESTIONS ABOUT CONTROL SET-UP \*\*\*

**Q1-1 How do I reset the stroke stored in the control?**

A1-1 Any control ordered with a door operator comes with the proper stroke stored in its memory. If you ordered a control on a small parts ticket, or moved a control to a different door, you must instruct the control to do a full 'learn' cycle. To do this, press and hold the **SET** button down while momentarily pressing **RESET**, or hold the **SET** button down while powering up the control. The control will learn the new stroke and store it automatically.

**Q1-2 How do I verify the stroke that a particular control is set to?**

A1-2 Locate the **tS** parameter and press **SET** to view it. The stroke will be displayed in inches. The total stroke can also be modified via the **UP** and **DOWN** buttons, but it's not recommended - we suggest letting the control determine the stroke automatically with a full 'learn' cycle instead.

**Q1-3 How do I reset the control to the factory default parameters?**

A1-3 Instruct the control to do a full 'learn' cycle. To do this, press and hold the **SET** button down while momentarily pressing **RESET**, or hold the **SET** button down while powering up the control. The control will restore all the factory settings.

**Q1-4 What are the default settings in the parameter list when I force the control to do a full learn cycle?**

A1-4 Refer to the chart in the **FIELD QUICK START INSTRUCTIONS**, which shows all the defaults.

**Q1-5 Can the control re-learn the stroke without changing any of my other settings?**

A1-5 Yes. In Version 2.03 & later, holding both the **SET** and **UP** buttons while momentarily pressing **RESET** or powering up will retain all of your present settings except for the stroke.

**Q1-6 I changed some settings, but everytime I reset the control or there's a power loss, the control goes back to its original settings! What's going on?**

A1-6 You must remember to save the settings you decided on before you close the header! To save your new settings into permanent memory, the toggle switch must be on (door must be in normal operation). Push and hold the **SET** button until the display shows **dS**. Your new settings are now stored. Data is only stored when the door arrives at the fully closed or open positions; also, note that all normal door operation is disabled until the **SET** button is released.

**Q1-7 I would like to move the point where the door goes into open check.**

A1-7 Locate the **CP** (Check Point) parameter and modify it. This parameter is in inches of stroke, and can be set from 50% to 90% of the total stroke.

**Q1-8 I changed the total stroke manually, and the control also moved my check point. Why?**

A1-8 This is normal, and is done to properly re-locate the open check point. You should have set the total stroke first, or allowed the control to automatically learn it, then reset the open check point to your desired value.

**Q1-9 I changed some parameters and really messed things up. How do I get back where I started?**

A1-9 Assuming that you haven't saved the new 'messed up' parameters, simply pressing **RESET** will restore all of the settings you had before you started tinkering. If you did a data save, your original parameters are lost, and you will have to do a complete learn cycle to get back to a parameter set that at least works in your door.

**Q1-10 I installed an on-off switch for partial open operation and set the **PO** parameter to 24", but I'm getting 48" of partial opening on my bi-part operator. Why?**

A1-10 All measurements in the C2150 control are based on inches of stroke, not inches of door opening. The 24" setting will yield a 24" door opening on single-slide operators - but for bi-part doors, you should set **PO** to 12".

**Q1-11 When are the cushion speeds (**OU** and **CU**) active?**

A1-11 In encoder-based operators, cushion speed is selected when the door is within approximately 1" of the full open or close position.

**Q1-12 I need two delay times, one for full open and one for partial. Is this possible without extra equipment?**

A1-12 No problem. Time delay **d1** is used for full open, and **d2** for partial open. Each delay may be set independently from 1-60 seconds.

**Q1-13 When does the delay start?**

A1-13 When the door reaches the partial- or full-open position and all the actuators have dropped out.

**Q1-14 What sensing devices are active when the door is closed? Open? Closing?**

A1-14 The C2150 has four modes of operation - day 2-way, day 1-way, night 2-way, and night 1-way. The following chart shows which actuating and safety devices are functional when the door is in the various

MODE		ACTUATES			HOLDS OPEN				RECYCLES			
		int	ext	sw-C	int	ext	beam	sw-C	int	ext	beam	sw-C
DAY	2WAY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DAY	1WAY	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
NITE	2WAY			✓			✓	✓			✓	✓
NITE	1WAY			✓			✓	✓			✓	✓

Day 2-way mode is enabled with the keyswitch input (pin 16) of CN2 jumpered to common. Day 1-way mode is enabled with the keyswitch input (pin 16) and the sw-B input (pin 13) of CN2 jumpered to common.



Night 2-way mode is enabled when both pin 16 & pin 13 of CN2 are open. Night 1-way mode is enabled with the sw-B input (pin 13) of CN2 jumpered to common.

Note that the sw-C input (pin 14 of CN2), and the **DOWN** pushbutton as well (service aid), always actuate the door at any time regardless of mode selected. The safety beam always holds the door open or recycles it. The beam input is always disabled when the door is fully closed. Provision has been made to easily modify this chart if required - consult the factory for details.

In day 1-way mode, all detectors remain enabled throughout the hold-open and closing modes for maximum safety, per ANSI standard A156.10, section 5.2.3.

**Q1-15** There's a red LED marked +100 next to the display that comes on when some parameters are accessed.

**A1-15** This LED shows that you must add 100 to the display value. Think of it as a third '1' digit in front of the other two.

**Q1-16** I have an installation where the night mode is in use with a card reader for activation. I would like to add motecs that are active only when the door is open or closing, for additional safety.

**A1-16** This is no problem. Wire the motecs to their usual connections and call the Technical Assistance Group at Horton for a couple of parameter changes that will do exactly what you want - with no wiring changes required!

**Q1-17** I'm confused about exactly how to wire the one-way operation switch.

**A1-17** Simply connect the one-way switch between pin 13 of CN2 and any common terminal (4, 7, 9, 11, or 15). Don't rewire anything else - it's not necessary! When the switch is off, normal 2-way operation results. Turn the switch on for one-way operation.

**Q1-18** What about partial open? How is it handled?

**A1-18** When Version 2 software is used, connect the partial-open switch between pin 12 of CN2 and any common terminal (4, 7, 9, 11, or 15). When the switch is off, the door will open fully when actuated. Turn the switch on for partial door operation. Remember, the **PO** parameter may be used to adjust the amount of partial opening in Version 2 software, and **d2** adjusts the time delay when the door is in the partial open mode.

### \*\*\* QUESTIONS ABOUT LOCKS AND DOOR LOCKING \*\*\*

**Q2-1** If a lock is present, when does the door lock in the various modes?

**A2-1** The following chart summarizes the locking options for each mode:

TRAFFIC MODE		dL: off L1: off	dL: off L1: on	dL: on L1: doesn't matter
DAY	2WAY	UNLOCKED	UNLOCKED	LOCKED
DAY	1WAY	UNLOCKED	LOCKED	LOCKED
NITE	2WAY	LOCKED	LOCKED	LOCKED
NITE	1WAY	LOCKED	LOCKED	LOCKED

**Note:** If L1 is in use and the door is closed and idle, the lock will not change states instantly when switching between one-way and two-way modes. When switching from two-way to one-way mode, the door will be locked (a) after the next open cycle, or (b) after a maximum of 20 seconds. When switching from one-way to two-way mode, the door will remain locked until the first cycle and unlocked thereafter. Also, the L1 parameter is not available in earlier software Versions 2.00-2.02. If the control has an earlier version and you need this feature, contact the factory for a software upgrade.

**Q2-2** I want to add a Horton autolock. What should I do?

**A2-2** No problem. Consult Horton for the proper items to order - you will need a lock assembly, a C3975 lock wiring harness, and some other mechanical parts. Plug the lock harness into CN4 on the C2150 control and force a complete learn cycle by holding **SET** while momentarily depressing **RESET** (or powering up). The control will automatically determine the lock type, and the display will momentarily flash **SE** if the lock is fail-secure, or **SA** if it's fail-safe. The control will then save the updated configuration, which includes the fact that there's a lock present.

**Q2-3** Is there a way to tell the control that it now has a lock without losing all of my preset speeds, options, etc.?

**A2-3** Yes, if you've already set other parameters and don't want to lose this information, look up the lock parameters **LL**, **SA**, **UL**, **BL**, **dL**, and **L1**, and set them manually for the type of lock you're using. For a standard Horton fail-secure lock (the most common type), **LL** will be on, and the other parameters will be off. *Don't forget to do a data save after you change the parameters!!!*

**Q2-4** Is there an advantage to using Horton's lock?

**A2-4** Our locks have extra voltage reduction circuitry directly on the lock. This extends lock life and reduces lock energy consumption by about 90%.

**Q2-5** I want to add a non-Horton lock that doesn't have a monitor switch. Is this possible?

**A2-5** Yes. You will need two parts - a Horton C3881 relay module and C3981 interconnecting lacs. The C3881 module includes a relay with dry contacts to drive your lock. You must set the **LL** option to on so the control knows that a lock is present, and also set the **UL** (Unmonitored Lock) option to on since the lock doesn't have a monitor switch. The control will insert a fixed 3/4-second delay to allow the lock to clear before it attempts to open the door. During this delay, **UL** will display.

**Q2-6** I added a lock, and the door binds up against it.

**A2-6** You forgot to tell the control that it now has a lock to deal with. See the answers above and re-configure the control.

**Q2-7** My door binds against its lock, and I get a UF on the display.

**A2-7** This means "Unlock Failure." The control knows that a lock is present, but cannot release it for some reason. Check for mechanical



binding in the lock mechanism, or for a disconnected cable to the lock. If the lock is in fact releasing, but you still get a **UF** error, check the lock monitor switch to be sure that it's tripping when the lock releases. If you have no monitor switch, you must remember to set the **UL** option to **ON**.

**Q2-8 My customer wants a bi-stable (two-coil) lock. Is this possible?**

**A2-8** Yes - although Horton does not recommend bi-stable locks, the control will support them. You must order the proper kit from Horton for this type of lock before installation. Set option parameters **LL** (Lock present) and **BL** (bi-stable Lock) to **ON**. Note that bi-stable locks must have a monitor switch for proper operation. Also note that the control cannot automatically determine the presence of a bi-stable lock on power-up; you must manually set this option. Finally, fail-secure and fail-safe have no meaning for a bi-stable lock, so the **SA** option parameter does nothing.

**Q2-9 My door has both a battery pack and a lock, and I have the PF parameter set for power fail close. Will the door lock after closing?**

**A2-9** It depends on the lock type. If you have a fail-secure or a bi-stable lock, the door will always lock after closing; a fail-safe type will leave the door unlocked.

**Q2-10 I want the door to stay unlocked in the daytime, and then lock after hours, using a customer-supplied contact. How do I do this?**

**A2-10** Your customer's contact should be closed during the daytime, and open at night. Connect it to the keyswitch input (pins 15 & 16). When this contact opens, the door will ignore the motec signals (but not the safety beams) and close and lock. After the door has closed and locked, all actuate signals from the motecs and beams will be ignored until the keyswitch contact closes again. The display will show **DA** (dAyltime) if pins 15 & 16 are closed, or **NT** (night) if they are open. Also, parameter **dL** (daytime Locking) should remain **OE** in order to keep the door unlocked in the daytime.

**Q2-11 I added the day/night feature, and now the customer wants a way to open the door from a card reader or keyswitch at night.**

**A2-11** Bring the dry contact from the reader system or keyswitch into the sw-C input of the control (pin 14). This switch has priority and will always open the door, even when the motecs and beams are being ignored. The only time this input will not make the door respond is when the TOG input (pin 8) is turned off, or the door is broken out.

**Q2-12 If the door has a lock, should I enable autoseal to prevent possible jams?**

**A2-12** All processor controls feature "intelligent unjam" and will jog the door (and the lock, for that matter) back and forth in an effort to unjam an uncooperative lock. This occurs regardless of whether autoseal is turned on or off.

### \*\*\* QUESTIONS ABOUT THE BATTERY PACK \*\*\*

**Q3-1 I added a battery pack for power failure protection. Is there anything else I have to do besides plug it into CN3?**

**A3-1** You should set the **PF** parameter in the configuration to either **OP** if you want power fail open, or **CL** if you want power fail close.

**Q3-2 My door is stuck open, and the display is flashing bF.**

**A3-2** You have the European self-monitoring style battery pack, and the batteries may be defective; or, if the pack was just installed, the batteries may need to be charged. The orange **FAIL** indicator on the battery pack will also be lit when **bF** shows. Push the **FAIL RESET** button in the battery pack assembly to attempt to clear the condition. The **FAIL** indicator may or may not go out. If it goes out, do a manual battery test as explained below to determine whether the failure was due to a remotely possible 'glitch' or is really indicating a battery failure. If necessary, replace the batteries or the complete assembly.

**Q3-3 Do the batteries continue to drain after the door completes its cycle on power failure?**

**A3-3** No.

**Q3-4 Is power fail open or close still active in night mode?**

**A3-4** Yes. The only time that PFO or PFC is not active is when the toggle switch/SO cutoff input (pin 8) is opened.

**Q3-5 Can the batteries be tested manually?**

**A3-5** Yes. If you have the U.S. version of the pack circuitry, simply unplug power to the control from the power supply assembly, or turn off the breaker supplying power to the door. The display should switch to **PF** within 1 second, and the door should open or close, depending on whether the option is set to **OP** or **CL**. After the door arrives at the proper position, the entire control should go dead until power is restored. When power is restored, the red **CHARGE** indicator on the pack circuit board will glow for 1-3 minutes, then will dim and go out completely (this assumes that the batteries were fully charged when you performed the test).

If you have the European version of the pack circuitry, press and hold the **TEST** button on the pack circuit board until the yellow **TEST** indicator comes on, then release it. The pack is now self-testing to insure that enough battery power is present to open or close the door for one cycle. If all is well, the **TEST** indicator will go out after about 15 seconds, and the red **CHARGE** indicator will come on. It will glow for 5-7 minutes, then will dim and go out completely (this assumes that the batteries were fully charged when you performed the test).

**Q3-6 In the European self-monitored version, how often is the battery pack tested?**

**A3-6** Upon power-up and at least once every hour thereafter.

**Q3-7 Why was the self-test feature deleted from the U.S. version?**

**A3-7** There were a variety of reasons as follows:

1. U.S. door operators typically use mechanical protection (e.g. breakouts) as the primary means for safety-to-life concerns.
2. Standards for automatic doors in the U.S. do not require periodic testing of battery packs. The battery manufacturers have stated that regular periodic testing is not only unnecessary, but it actually shortens the life expectancy of the batteries.
3. Eliminating the self-test circuitry reduces board size and complexity (and hence, price). Reliability is also enhanced, since there are fewer components.



**Q3-8 What happens if the pack test fails?**

**A3-8** In the daytime mode of operation, a battery failure will send it to the full open position, per the Euro standard. The door will stay open and the display will flash **bF** until the failure is corrected.

To maintain security, battery failures are ignored in night mode, but the failure condition is stored on the pack circuit board. When the door is next switched back to day mode, it will drive fully open and indicate the failure on the display.

**\*\*\* QUESTIONS ABOUT THE BUILT-IN DIAGNOSTICS \*\*\***

**Q4-1 How do I run the encoder test?**

**A4-1** To run the test, press and hold the **DOWN** button while momentarily pressing **RESET** or powering up the control. The display will show **Et** (Encoder test) briefly, then will switch to a pair of short lines. Release the **DOWN** button. As you push the door manually, these lines must rotate smoothly and evenly. The boxes they form will rotate counter-clockwise when the door is opening (just like the drive pulley, as viewed from the gear drive side), and clockwise when the door is closing. To exit the encoder test, press **RESET**. Note that the door will not respond to any actuate inputs when in the encoder test mode.

**Q4-2 Is there a way to manually cycle the door without using a jumper wire?**

**A4-2** Yes. Any time that the toggle switch input is active and the door is ready to run, the **DOWN** button is configured to simulate an open command. This allows manually testing door operation. You may also set the **ct** option to cycle test the door repetitively if desired.

**\*\*\* QUESTIONS ABOUT FAILURE CODES \*\*\***

**Q5-1 When I try to store values, my control starts blinking dF and quits working until reset.**

**A5-1** The control has failed and must be replaced.

**Q5-2 When I power up the control, the door refuses to move at all, but the display indicates that something is trying to happen. What do I check first?**

**A5-2** If the door will not move at all, first check fuse **F2** on the power supply. This fuse protects the high-voltage (motor) power supply. If **F2** is blown, replace it with a slow-blow 3.15A 5x20mm fuse (T3.15A) - Buss type GDC3.15, or equal. **Caution**, disconnect power and wait 30 seconds before servicing the power supply assembly!! If **F2** is OK, check the motor and motor harness for an open motor. Finally, if both the motor and **F2** appear to be good, replace the **C2150** control.

**NOTE:** If fuse **F2** continues to blow at totally random intervals, there is a good possibility that the door is being locked manually without turning off the toggle circuit first. If Version 2.06 or earlier is installed, upgrading to a later version will normally circumvent this problem with the new jam sensing feature. See question 5-8 for more details.

**Q5-3 I replaced fuse F2, and the new fuse immediately blew as well. What next?**

**A5-3** Unplug the 5-conductor harness connecting the power supply to the control, replace fuse **F2** again, and apply AC power to the power supply without the control attached. If the fuse pops again, the power supply should be replaced. If the fuse holds, check the motor and motor harness assembly for a defective motor or a short between motor and frame ground. If the motor seems OK, replace the **C2150** control.

**Q5-4 When I power up the control, the door closes normally, then the display starts flashing nS. What gives?**

**A5-4** This stands for no Switch - the close monitor switch is not supplying a "door fully closed" indication to the control. Check your switch, its mechanical adjustments, and its wiring.

**Q5-5 I arrived at the jobsite for troubleshooting, and the C2150 is flashing nS. The close monitor switch seems OK, and the yellow CLM (close monitor) LED lights when the switch is depressed. What else could be wrong?**

**A5-5** Anytime that **nS** flashes, the door is not arriving at the fully closed position. Check for a mechanical jam at some point in door closing. Also, this will normally never happen if the reversing sensitivity is adjusted properly - the door will recycle instead when the obstruction is encountered. Find and correct the cause of the obstruction, then check the reversing sensitivity.

**Q5-6 I replaced a defective encoder, and now the door slams open. The display then blinks EP until I reset the control. Why?**

**A5-6** This display means Encoder Phase error. Your encoder is wired improperly - reverse the green and white wires on pins 2 & 3 of the encoder assembly.

**NOTE:** On software versions prior to 2.02, the **EP** error function was not enabled. Other errors, notably **SF** and **EF**, are seen instead. If you suspect an encoder phasing error or have door motion problems with these earlier versions, you should run the quick encoder test to verify proper encoder phasing.

**Q5-7 When the door starts opening, it slows down almost immediately, then slowly increases speed and eventually shuts off. The display flashes EF momentarily. Why?**

**A5-7** This display means Encoder Failure. The position encoder is not plugged in, or is defective. Check your encoder wiring and run the quick encoder test. On Rev. E and later **C2150** circuit boards, you should also make sure that jumper blocks **JB1A** and **JB1B** are not installed.

**Q5-8 The door begins opening, then immediately stops and flashes J1, followed by d1. It then cushions back closed after the sensors drop out. Why?**

**A5-8** Beginning in Version 2.07, the **J1** (Jam 1) error appears any time that the door stops moving at the beginning of an open or close cycle. This feature provides protection against blowing fuse **F2** when the door has been locked manually (thumb turn, etc.) without turning off the toggle switch circuit. Other possible causes of the **J1** code appearing include a defective or unplugged position encoder, a slipping encoder wheel, open motor, or no power to the motor circuit. Finally, if the **C2150** control is Rev. E or later, be sure that jumper blocks **JB1A** and **JB1B** are not installed.



It is possible for this feature to cause problems if the open or close speeds are turned down enough to be extremely slow, although extensive testing at the plant has not revealed any difficulties. If a situation does come up where you are getting false J1 indications, the JS (Jam Sensing) parameter may be turned qE to circumvent the problem. JS defaults to qn.

The J1 error is normally self-resetting; however, note that if any motion detectors or safety beams are held actuated after the error occurs, the door may have to be pushed open following manual unlocking, to let the first pedestrian in. When the detection devices time out, everything will be back to normal.

**NOTE:** If the C2150 control is retrofitted to an earlier operator that uses a 3ppr "paddle wheel" encoder and Version 2.07 or 2.08 software is in use, false J1 indications may occur. If so, the JS parameter will probably need to be turned qE; alternatively, the software may be upgraded to Version 2.09 or later to correct the problem.

### \*\*\* MISCELLANEOUS QUESTIONS \*\*\*

**Q6-1 How do I know what software version I have?**

A6-1 Reset the control. The version number will be displayed sequentially in two parts, as in 2. and then 11 (Version 2.11).

**Q6-2 Why is an open speed of '0' faster than a close speed of '5'?**

A6-2 The control is working properly. In order to get maximum adjustment range and limit maximum closing speed, an open speed of '15' is approximately 120VDC, but a close speed of '15' is only around 60VDC.

**Q6-3 I can't get autoseal to work. Why?**

A6-3 Autoseal only functions in the daytime (dA) mode. If you are not using the day/night mode, install a jumper between pins 15 and 16 of the control input terminal strip to enable daytime mode operation and everything should work normally.

**Q6-4 Is there a battery that saves the door parameters? Do I need the optional battery pack for this?**

A6-4 To both questions, no. Control parameters are saved in a special chip called an E2PROM, which does not require a battery. When you save your parameters, they will be retained for the lifetime of the control.

**Q6-5 After installing a presence detector, the door refuses to operate. The display shows Pd. Why?**

A6-5 The presence detector is "seeing" the door. Normally, any active sensors will cause the door to stop dead in its tracks when it is setting up, to provide maximum protection for pedestrians. On Version 2.11 & later, you may temporarily override the Pd indication by holding the UP button until the door closes fully. To fix this permanently, after the door completes its "learn" cycle, you must set the St (Stop OK on first run) parameter to qE. When power is lost and returns, the door will now ignore all safety sensors on its first run while closing slowly to the home position, then normal operation will commence.

**Q6-6 I installed a control in a linear (bearing) drive header that has a pulley-mounted encoder. The display shows my total stroke as 43", but the actual stroke is 36" - yet everything seems to operate properly. Is something wrong?**

A6-6 All computations in the C2150 control are correct only when used with Horton's belt drive operator, where 1 pulse = 0.142". The control will work properly with other operators, but the inch measurements will not be correct in these cases.

**NOTE:** Horton strongly recommends that you add switch assemblies to any linear drive operator with an encoder, and convert to switch based operation with Version 1 software instead. Consult the Horton factory for details.

**Q6-7 Can I use the C2150 with BEA's CPSS system?**

A6-7 The C2150 will work fine with CPSS *provided that you do not need one way operation*. As of this printing, the CPSS supplies only one relay contact output for detection from either side of the door, so the C2150 has no way to distinguish whether it is receiving an interior or exterior motion signal. One way operation with the CPSS12 can be supported via special wiring - consult the factory for details.

**Q6-8 I need to interface a C1520-1 (RS-25) threshold scan. How do I do this?**

A6-8 First, the C2150 control has +24VDC outputs, and a threshold scan MUST have AC input voltage to operate. Use the 24VAC accessory power connection (CN3) on the power supply assembly to furnish power to the C1520-1 detector. Since the C2150 supports two motion detector inputs, we do not recommend using the "series" mode of the threshold scan, where the motion detectors feed the scan, which then feeds the control - you should use the conventional mode instead, and feed the motion detectors directly into the C2150. However, there is no control output from a C2150 to switch the C1520-1 when the door opens - you must use a microswitch or a reed switch to feed the C1520-1 "door open" information. Horton suggests that the relay output of the threshold scan be connected to the safety beam input (pin 6) of the C2150 control. Call the factory for further wiring details. Finally, the St option must normally be set to qE when using presence detectors - see the question above for more information.

**Q6-9 I installed a very heavy door (over 400 pounds), and/or am using a 1/4hp heavy-duty motor, and the braking seems very abrupt. Why?**

A6-9 The standard braking on the C2150 control is optimized for light to medium weight doors with 1/8hp standard motors, and will suffice for the vast majority of applications. When installing a very heavy door or using a 1/4hp motor, you should set the Hd (heavy duty) parameter to qn. This will change the braking to a more gentle curve and minimize wear and tear on the door and operator. Note that with the different braking, you may have to move the check point back slightly and/or slow the door down a little to achieve smooth operation.

**Note:** Versions prior to 2.10 use a very "soft" braking curve when the Hd parameter is turned qn. You may encounter a situation where braking is too abrupt with Hd qE, and is inadequately braking the door with Hd qn. The Hd braking curve in Version 2.10 has been modified for a better fit with typical commercial doors. Contact the factory if a software upgrade is required.

**Q6-10 I accidentally shorted the +24VDC control output to ground, and the whole control went dead. What do I check?**

A6-10 Fuse F3 on the C3955 power supply assembly protects the low-voltage wiring. Also, if you have a battery pack, fuse F1 on the battery pack will be blown. Both fuses should be replaced with a slow-blow 3.15A 5x20mm fuse (T3.15A). This fuse is available at any electronic supply house, and at many Radio Shack stores as well. *Do not bypass the fuse with a jumper!* Caution, disconnect power and wait 30 seconds before servicing the power supply assembly!!



**Q6-11 How do I tell which connections on the C2150 control are common?**

A6-11 Any terminal number with a period after it (4, 7, 9, 11, 15,) is a common connection. These are all tied together internally.

**Q6-12 How do I tell which connections are for power?**

A6-12 The two +24V power terminals (1 & 5) have a small "DC power" symbol (- -) next to them.

**Q6-13 Is the control common tied to ground inside the control?**

A6-13 Not directly. To protect against noise, there is an AC path (10K $\Omega$  in parallel with 0.1 $\mu$ F, for those who are technically minded) from control common to frame ground, but if you install a beam set or motec that has its case grounded, or accidentally short from common to the door frame, everything will still work normally.

**Q6-14 What are the input characteristics?**

A6-14 All inputs are well protected against noise and random triggering, and are +5VDC levels. For an input to operate, the resistance must typically drop below 780 $\Omega$ . A large amount of hysteresis protects against jittering - for the same input to release once it's triggered, the resistance must rise above 1800 $\Omega$  or so. Typical current requirement per input is 8mA, and the inputs will not respond for about 2.5ms following activation. These requirements are well suited to the vast majority of applications (e.g. motecs, card readers, safety beams etc.) but are not optimized for use with mats. It is recommended that installations with mats specify Horton p/n C1550, an option which provides AC voltage on the mats and eliminates corrosion problems.

**Q6-15 Explain the function of the rP parameter.**

A6-15 This parameter provides additional safety during the closing cycle of the door in Version 2.06 & up. If rP is turned on, the door automatically reverses back open if it is attempting to close and three or more encoder pulses in the open direction are encountered. This would occur if the door is closing and someone comes up and forces the door back in the open direction. The rP option defaults to on.

**Q6-16 What does the nA parameter do?**

A6-16 Beginning with Version 2.05, this parameter is provided to defeat control adjustment by unauthorized personnel. If the nA parameter is in use, when the toggle switch is turned off, the display shows nA (no Adjustments permitted) instead of the parameter list. The proper sequence of UP, DOWN, and SET buttons must be pressed to "unlock" the control before any parameters can be viewed or adjusted. Additionally, access to all diagnostics is denied when nA is turned on. Contact the factory, or refer to the additional paperwork that came with the operator, to obtain the current unlock code.

If you accidentally set nA to on but you don't want it, you can simply press RESET to restore the adjustment capability as long as a data save wasn't performed. If you did a data save, you must unlock the control, turn off nA, and do another data save with nA turned off.

**Q6-17 Why is the decimal point blinking?**

A6-17 Beginning in Version 2.10, the right decimal point blinks any time that the toggle switch is off and the control is in the parameter-setting mode.

**Q6-18 In Version 2.09 & before, turning off the toggle circuit always put my control at the top of the menu (the OS parameter). I notice that in Version 2.10, I'm always returned to the last parameter that I adjusted instead. Is there a quick way to get back to the top of the menu?**

A6-18 In Version 2.10 and later, you may press the UP and DOWN buttons simultaneously to return to the top of the menu from any other parameter.

**Q6-19 Explain the SP (sidelite protection) parameter and what it does.**

A6-19 This seldom-used feature is provided if you have an accessory that protects the sidelite area of the door from pedestrians. Such a device (typically an active infrared system or similar) may be wired to the safety beam input (pin 6 of CN2) on the C2150 control, and the SP option set to on. If the sidelite area is entered when the door is opening, the control will protect the sidelite area by immediately slowing to check speed. Note that with SP on, the safety beams will also reduce door speed if they are broken while the door is opening; however, this is not normally a problem unless the motion detector pattern is extremely small and the pedestrian is moving at high speed. Also, the protection device must not see the door or it will hang the door up!

**Q6-20 I need a dry contact any time the door is open. Is this possible?**

A6-20 Yes, an accessory is available that supplies a dry contact for running security alarms, air curtains, etc. The software version must be 2.10 or later - contact the factory for details.

**Q6-21 I need a momentary dry contact at the end of each open cycle to run a counter. Is this built in?**

A6-21 This feature is supported as well, using an accessory device - contact the factory for details.

**Q6-22 What are the correct settings for jumper block JB1 on Rev. E and later C2150 controls?**

A6-22 Jumpers JB1A & JB1B should always be removed when the C2150 control is used in an operator with an encoder, and installed when the control is installed in an operator with microswitches. The encoder test will indicate an encoder failure if the jumpers are incorrectly left installed when an encoder is in use. However, no damage will occur.

**Q6-23 What does switch S5 do on Rev. E and later C2150 controls?**

A6-23 This switch is in series with the toggle circuit and is provided to assist troubleshooting and adjustments. When the switch is set to OFF, the toggle circuit is disconnected (the door is off, and control is in parameter-setting mode). When the switch is set to EXT, the external toggle switch (and SO cutoff switches, if any) will determine whether the door is on or not.





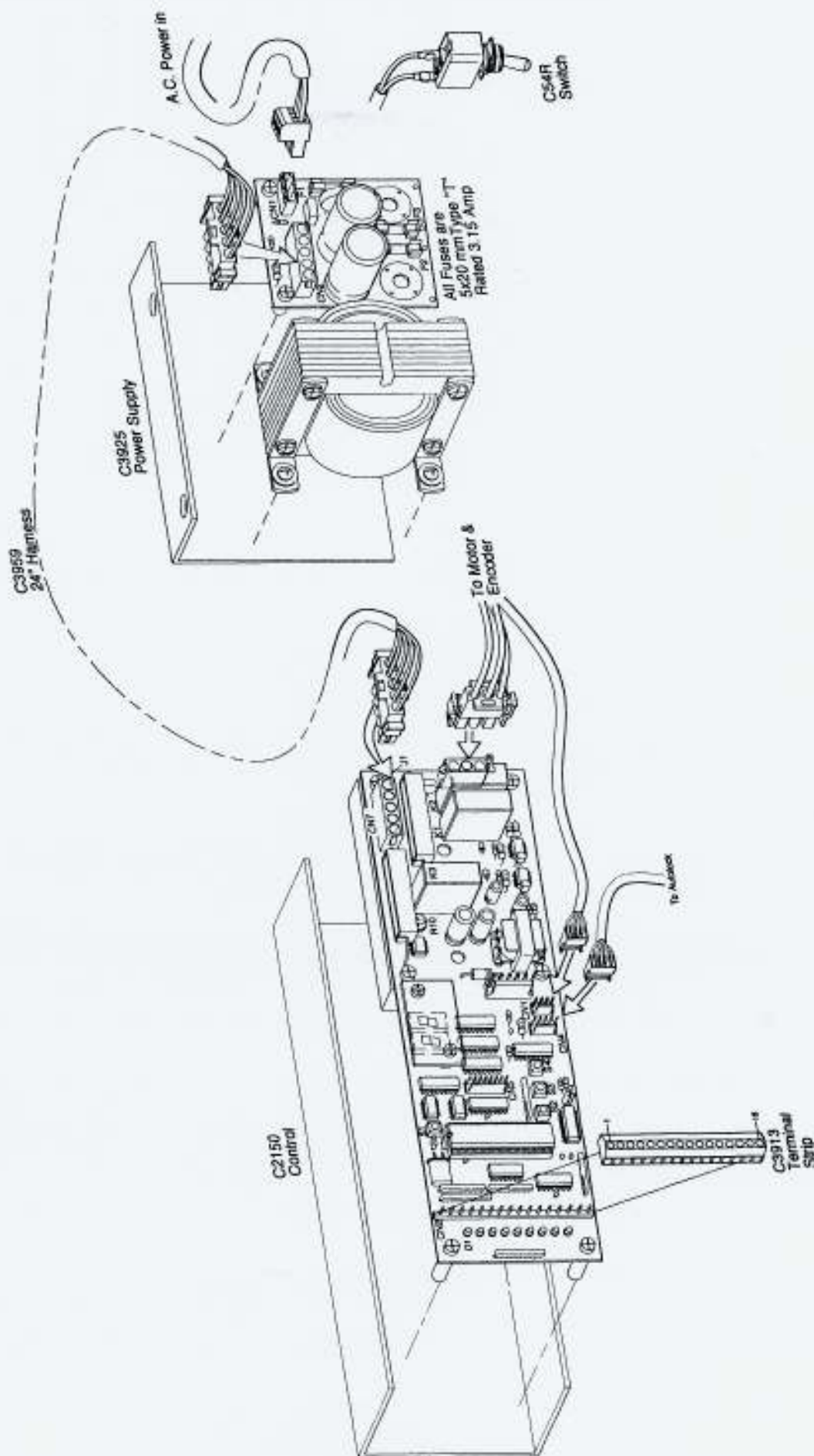


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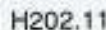
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