

Industrial Door

C6150 Microprocessor Control

For door operators with Version 4 software

Field Quick-Start Instructions and Common Questions and Answers

SERIES 6000 SLIDE DOOR OPERATOR

with C6150 Control and Version 4 Software

SECTION 1: QUICK-START INSTRUCTIONS

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

1. After completing the mechanical installation, proceed as follows:
 - a. Wire the motor/encoder assembly to the control. The terminal strip on the back of the motor includes connections for both the motor and encoder. Follow the wiring diagram provided (Drawing #11190). The motor is wired to CN4 on the C6475 board inside the control; the encoder to CN7 on the C6465 board.
 - b. Wire the close monitor reed switch to the control. The terminal strip for the reed switch is located on the motor bracket. Connect the wires to terminals #10 and #11 of CN2 on the C6465 board. Push the door fully closed, then attach the monitor switch magnet and bracket to the operator belt so that switch and magnet face each other when the door is fully closed.
2. Check the incoming power for proper voltage (**120VAC only!!**) and connections. Pin 1 of connector CN1 on the C6475 board is to be wired to the HOT side of the AC line (normally black-US or brown-international). Pin 2 of CN1 is for the NEUTRAL side of the AC line (normally white-US or blue-international). Pin 3 of CN1 is frame ground (green-US or green/yellow-international).
3. If you do not plan to use a 3-button station or an emergency stop switch, a jumper must be present between pins 15 and 16 of CN2, the main input connector. This wiring is normally done for you at the factory.
4. Set reversing sensitivity adjustment R9 fully counter-clockwise. Do not wire any motion detectors, safety beams, or other accessory devices at this time.
5. **Caution**, door will move! Move the door manually to a position in mid-stroke. Set slide switch S5 in the control to the **ON** position, and while holding down the **SET** button in the control, apply AC power.
 - a. The display should wink the version number in two parts (as in 4. then 03). The control will then check for the presence of a monitored lock. If no lock is present, or the lock does not have a monitor switch, **nL** (no Lock) will display briefly. *If a Horton C9910 in-line lock is installed, it will be taken care of in step 11 later. The nL indication is no cause for concern.*
 - b. Next, the display should indicate **FC** (for first run - Finding Close stop), and the door should fully close at slow speed. *If the door moves in the open direction instead, immediately turn off power and reverse the motor leads, either at the motor, or at pins 1 & 2 of connector CN4 on the C6475 board, then repeat step 5.*
 - c. When the door has fully closed, the yellow CLM (close monitor) indicator should come on, the display should switch to **FO** (for first run - Finding Open stop), and the door should drive fully open at slow speed.

11. If you have a Horton C9910 in-line brake for door locking, wire the brake to terminals #4 and #5 of connector CN4 on the C6475 power supply board (polarity does not matter). Follow steps 7 and 8 above to set parameters LL and HL to on for the control to recognize the lock. Check for proper door locking and make mechanical brake adjustments if required.

This concludes the electrical installation and set-up.

The following chart shows all of the adjustable parameters. Refer to steps 7 and 8 on page H604.2 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	6	0-15
CC	Close Check	6	0-15
OU	Open cUshion	4	0-15
CU	Close cUshion	4	0-15
d1	delay time 1 (full)	1 sec	1-199
d2	delay time 2 (partial)	1 sec	1-199
d3	delay time 3 (safety)	3 sec	1-199
CP	open Check Point	75% of stroke	50-90% tS
PO	Partial Open position	8"	8"- tS"
tS	total Stroke	(as determined by learn cycle)	20-199"
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
Sn	Safety nosings	oF (no)	oF/on
Cb	Close braking	on (yes)	oF/on
br	brake on recycles	on (yes)	oF/on
SL	SLOW open speeds	oF (use regular open speeds)	oF/on
tC	turboCharge open speeds	oF (use regular open speeds)	oF/on
rA	reduced Acceleration	oF (use standard acceleration)	oF/on
3t	3-button station	oF (standard switches, not 3-button)	oF/on
LL	Lock present	oF (on if monitored lock found)	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
HL	Horton in-line Lock	oF (standard lock, not in-line type)	oF/on
LO	Lock Open	oF (lock in closed position only)	oF/on
rP	reverse on encoder Pulses	on (Version 4.02 & up only)	oF/on
JS	Jam Sensing	on (Version 4.03 & up only)	oF/on

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

- Q1-2 Can the control re-learn the stroke without changing any of my other settings?
- A1-2 Yes. In Version 4.01 & 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.
- Q1-3 How do I verify the stroke that a particular control is set to?
- A1-3 Locate the **tS** parameter in the parameter list, 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.
- Q1-4 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 on page **H604.3**, which shows all the defaults.
- Q1-5 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?
- A1-5 You must remember to save the settings you decided on before you leave the jobsite! To save your new settings into permanent memory, either the toggle circuit must be on, or switch S5 must be in the **ON** position (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 normal door operation is disabled until the **SET** button is released.
- Q1-6 I would like to move the point where the door goes into open check.
- A1-6 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 learned on startup.
- Q1-7 I changed the total stroke manually, and the control also moved my check point. Why?
- A1-7 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.
- Q1-8 I changed some parameters and really messed things up. How do I get back where I started?
- A1-8 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.

- Q1-15 I installed a switch for partial opening operation and set the **PO** parameter for 36", but I'm getting 72" of partial opening on my bi-part operator. Why?
- A1-15 All measurements in the C6150 control are based on inches of stroke, not inches of door opening. The 36" setting will yield a 36" door opening on single-slide operators - but for bi-part doors, you would set **PO** to 18".
- Q1-16 I installed a stop button and wired it to pin 16 as shown on the drawing. When I push it and **St** displays, how do I get the door to run again?
- A1-16 To recover from a stop signal, you may actuate the door with any of the standard inputs - partial open with delay, full open with delay, or latch - and the door will continue opening as if nothing had happened. You may also momentarily depress the **DOWN** button (service aid) to continue opening. Finally, actuating the "close" input (SW-C, pin 14 of CN2) or turning the toggle switch circuit off and back on again will continue the close cycle.
- Q1-17 I want to add an emergency stop switch. How can I do this?
- A1-17 It depends on the switch type. All stop switches should have normally closed (NC) contacts. If you have a momentary switch, wire it between pins 15 and 16 of CN2. This is input SW-D as described above. If you have a "mushroom" palm switch or other switch that has maintained contacts, Horton recommends wiring it into the toggle circuit at pins 8 and 9 of CN2. In this case, the slide switch in the control box must be set to **EXT**. The door will stop when the switch contact is broken, and will remain disabled until the contact is restored.
- Q1-18 My customer wants a three-button (open/close/stop) garage door type control box. Is this possible?
- A1-18 This feature is built in as well. Find the **3t** (3-button) station option and turn it on. Wire the pushbuttons as follows: open to pin 2 of CN2; close to pin 14; and stop to pin 16. The other side of all switches goes to common. **Note:** The 'stop' button must be normally closed - this is standard in three-button stations.
- Q1-19 I installed a door with a three-button station, but all I get is a time delay following opening, then the door starts closing again.
- A1-19 You forgot to turn on the **3t** option.
- Q1-20 How do the actuate inputs work on the C6150?
- A1-20 The actuator system is very versatile and will meet the requirements for the vast majority of field installations. Basically, three actuate lines are available: latch, momentary full open with time delay **d1**, and momentary partial open with time delay **d2**. A full open input takes priority over a partial open input, and a latch input takes top priority. If the door has been opened to the partial open position and a full open input comes along, the door moves immediately to the full open position, executes delay **d1**, and closes. If the door is in the partial open position and a latch input arrives, the door moves immediately to the full open position and latches open - code **LA** will display. There are also optional input lines for close and stop which are discussed more fully above.

Q1-29 This is a door with a dimple track. What parameters do I need to change?

A1-29 Dimple door handling has been significantly improved in the C6150 control. To enable the dimple track option, find a small black jumper block covering two right-hand pins vertically near W4. Remove this block and place it horizontally over the two pins marked **W4** instead.

When W4 is covered with the block, the control ignores loss of pulse situations while it clears the dimple in the open direction. A standard open speed of '3' is used for dimple climb-out. The door has a maximum of 6 seconds to climb out of the dimple; when it passes the 4.5" point, it accelerates to the open speed setting (if greater than '3') and continues a standard open cycle. On the first startup run, if W4 is installed, **dd** (dimple door) displays until the control pulls the door up out of the dimple on the first run; then **FO** displays as usual while the door finishes its "learn" cycle. On Version 4.03 & later, **dd** also appears during normal operation when the door is climbing out of the dimple.

If the C6150 control cannot pull the door out of the dimple, it flashes **dE** (dimple Error) for 5 seconds while it cools off; it then tries again.

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

Q2-1 How do I run the encoder test?

A2-1 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). You may now release the **DOWN** button. As you slowly push the door, the display will wink **OP** if the door is opening, or **CL** if it's closing. You should push the door in both directions at least a few inches to confirm normal encoder operation. To exit the encoder test, press **RESET**.

Q2-2 Is there a way to manually cycle the door without using a jumper wire?

A2-2 Yes. Any time that the toggle switch input is active and the door is ready to run, the **DOWN** button is configured to simulate a detector input. This allows manually testing door operation. You may also set the **ct** option to cycle test the door repetitively if desired. Furthermore, if the door was latched open by the pull chain input (**LA** is showing on the display), the **DOWN** button will switch from latched open to delay mode and allow normal closing after delay **d1**.

*** QUESTIONS ABOUT LOCKS AND DOOR LOCKING ***

Q3-1 I want to add a lock. What should I do?

A3-1 The "typical" lock for an industrial door is Horton's C9910 in-line brake lock; however, locks are supported in a variety of ways in the C6150. You may also use Horton's locks for standard S2001 operators, magnetic locks, bi-stable (two coil) locks, or even screw-bolt type locks. If a standard Horton in-line brake lock is to be used, follow step 11 on page **H604.3** to set the control properly.

- Q3-8 My customer wants a bi-stable (two-coil) lock. Is this possible?
- A3-8 Yes - although Horton does not recommend bi-stable locks, the control will support them. Consult Horton to order the proper kit for this type of lock before installation. Set both option parameters **LL** and **bL** to on. Note that bi-stable locks must have a monitor switch for proper operation. Also note that the control cannot determine the presence of a bi-stable lock on power-up; you must manually set this option. Finally, fail-safe and fail-secure have no meaning for a bi-stable lock, so the **SA** parameter does nothing.
- Q3-9 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?
- A3-9 It depends on the lock type. Magnetic locks and Horton's C9910 in-line brake lock obviously are fail-safe and will leave the door unlocked, since there's no power to operate the electromagnet. With a fail-secure or bi-stable lock, the door will always lock after closing.
- Q3-10 I have an inexpensive lock, and it buzzes (or burns out!) if the door is latched open for extended periods. What can I do?
- A3-10 Find the **LO** (Lock Open) option and turn it on. This drops the lock when the door is latched open and prevents this problem. When the door is unlatched to close, it will first re-energize the lock, then start closing.

***** QUESTIONS ABOUT THE OPTIONAL BATTERY PACK *****

- Q4-7 Which battery pack, self-monitored or standard, does Horton recommend?
- A4-7 We strongly recommend that you stick with the standard version of battery pack unless there is a compelling reason not to. There are 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 - the battery pack operation is secondary.
 2. ANSI standards for automatic doors in the U.S. do NOT require periodic testing of battery packs.
 3. The battery manufacturers have stated that regular periodic testing is not only unnecessary, but it actually shortens the life expectancy of the batteries.
 4. Eliminating the self-test circuitry reduces complexity (and hence, price). Finally, reliability is also enhanced, since there are fewer components.
- Q4-1 I added a battery pack for power failure protection. Is there anything else I have to do besides plug it into CN3?
- A4-1 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.

*** MISCELLANEOUS QUESTIONS ***

- Q5-1 I arrived at the jobsite for troubleshooting, and the C6150 is flashing **nS**. The switch seems OK, and the yellow close monitor LED lights when the switch is tripped. What else could be wrong?
- A5-1 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.
- Q5-2 When the door starts opening, it slows down almost immediately, then slowly increases speed and eventually shuts off. The display flashes **EF** momentarily. Why?
- A5-2 This display means 'Encoder Failure.' The position encoder is not connected, or is defective. Check your encoder wiring and run the quick encoder test.
- Q5-3 When I try to store values, my control starts blinking **dF** and quits working until reset.
- A5-3 The control has failed and must be replaced.
- Q5-4 I keep blowing fuse F1. What could be wrong?
- A5-4 The first thing to do in this situation is pull the motor/brake plug from connector CN4. Replace the fuse with a slow-blow 5A 5x20mm fuse (T5A). Power up the control again, and see if the new fuse holds with CN4 disconnected. If the fuse blows again, the control 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. Also inspect the brake and its wiring, if one is present. If everything seems OK, check for mechanical binding or excessive friction in the operator and door itself (guides, track, wheels, etc.) **Caution**, disconnect power and wait 30 seconds before servicing the control fuses!

NOTE: If fuse F1 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 4.02 or earlier is installed, upgrading to a later version will normally circumvent this problem with the new jam sensing feature. See question 5-17 for more details.

Q5-12 Is the control common tied to ground inside the control?

A5-12 Not directly. To protect against noise, there is an AC path (10K Ω in parallel with 0.1 μ 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.

Q5-13 Is there a battery that saves the door parameters? Do I need the optional battery pack to save the parameters?

A5-13 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 in the E²PROM, they will be retained for the lifetime of the control.

Q5-14 What are the input characteristics?

A5-14 All inputs are well protected against EMI and random triggering, and are +5VDC levels. For an input to operate, the resistance must typically drop below 780 Ω . A large amount of hysteresis protects against jittering - for the same input to release once it's triggered, the resistance must rise above 1800 Ω 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 with dry contact signals (e.g. mechanical switches, motecs, card readers, safety beams).

Q5-15 I need interlocked operation of two or more doors with C6150 controls. Is this supported?

A5-15 Yes. First, jumper pins 20 and 22 of CN2 on each control to be interlocked. Next, run a two-wire bus cable between each control - this connection and common. (All of the control pin 20s and pin 22s will be connected together, and all of the control commons as well). When a door is actuated, all the orange SW-H "busy" indicators in every control will light. If an actuate signal for any other door is presented, its display will indicate IL (InterLocking busy) and it will not open until the door that is currently open finishes closing. At this time, the SW-H "busy" indicators will go out, and any door may be opened. Note that this is "Level II" interlocking, where additional door requests are not memorized, but are simply ignored when a door is already open. If Level III true memory interlocking is desired, it is also available as an extra-cost option - consult the Horton factory for details.

Q5-16 What do the W1-W4 pins (J1) do on the control?

A5-16 Only W4 is currently used. Normally, there will be one spare jumper block installed over two ground pins (right hand pins) on W1-W4. This is the same as having no jumper blocks installed and is the default configuration for standard doors. If this block is removed and is placed over the W4 pins, dimple door operation is enabled (see discussion on dimple doors above). Positions W1 - W3 are currently used only for factory testing and have no function.