1. Introduction

NOVA HELIX is a range of single- and multichannel radio receivers incorporating secure code-hopping technology. The NOVA HELIX system offers both link and master learning capabilities to provide the user with the ultimate in usability and security and the technology inherent in all NOVA HELIX receivers ensures that the functionality goes well beyond the scope of standard receivers, literally putting unsurpassed convenience at the user's fingertips. In addition, the system supports backward compatibility with the NOVA range of transmitters, meaning that there is no need to purchase additional equipment if presently making use of NOVA.

2. Important safety information

1. All installation, repair, and service work to this product must be done by a suitably qualified person.
2. Do not in any way modify the components of the system.
3. Do not install this product near sensitive electrical components.
4. Do not install the equipment in an explosive atmosphere: the presence of flammable gas or fumes is a serious danger to safety.
5. Do not leave packing materials (plastic, polystyrene, etc.) within reach of children as such materials are potential sources of danger.
6. Dispose of all waste products like packing materials, according to local regulations.
7. Centurion Systems does not accept any liability caused by improper use of the product, or for use other than for which that the system was intended.
8. This product was designed and built strictly for the use indicated in this documentation. Any other use, not expressly indicated here, could compromise the safety life/operation of the product and/or be a source of danger.

3. General description

The operation manual describes the operation of the NOVA HELIX receivers.

1. The NOVA HELIX functionality allows for both “Master” learning and “Link” learning. Link Learning is the learning process associated with fitting a link to the J1 jumper on the receiver to learn buttons into memory. Master Learning, by contrast, uses a master button to place the receiver in Learn Mode (no links required) remotely.
2. All receivers support the ability to disable the function jumpers, J1 and J2 for additional security.
3. All receivers support SmartSwitch II interfacing capability.
4. All receivers support the new timed Autokern feature.

4. Technical specifications

<table>
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<tr>
<th>Technical Data</th>
<th>Single-channel Receiver</th>
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<tr>
<td>Operating frequency</td>
<td>433.92MHz</td>
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<tr>
<td>Supply voltage</td>
<td>12V – 24V DC</td>
</tr>
<tr>
<td>Quiescent current @ 12V DC</td>
<td>11mA</td>
</tr>
<tr>
<td>Maximum current @ 12V DC</td>
<td>40mA</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-15°C – 50°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 – 90% (non-condensing)</td>
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<td>Sensitivity</td>
<td>-115dB</td>
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<tr>
<td>Self-learning memory</td>
<td>62 buttons</td>
</tr>
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<td>Receiver enclosure</td>
<td>UV stabilised ABS</td>
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5. Product identification

6. Mounting the receiver

Single-channel receiver

1. Terminals
2. Buzzers
3. Jumpers
4. Relay
5. Antenna

7. Learning the First Master

1. To learn the first transmitter button into the receiver, the receiver transmitter memory as well as the channel compartment related to the function being learnt, must be blank. A channel compartment is a memory space that stores all the transmitter buttons that activate the functionality associated with the channel (for example activating a gate motor).
2. Press and hold a new transmitter button until a double beep is heard, which will indicate that the button has been successfully learned as a master button. The channel functionality will also activate. This button is said to master the channel that has been selected for learning.
3. The button can be released once the double beep has been heard (approximately 5 seconds after the button has been pressed).

8. Learning Additional Master Buttons

1. Press and hold the button that presently activates the device in question, for between 10 and 20 seconds. For example, if you want to add another transmitter to your garage door motor, press and hold the button that presently activates it. After 10 seconds, the receiver will provide a long beep to indicate that it has entered the Learn Mode window.
2. Press and hold any remote buttons you wish to learn into the receiver.
3. Any additional buttons learned into the receiver using this method will automatically be granted master privileges.

9. Demastering Buttons

When a HELIX system is commissioned, all buttons learnt into the receiver are granted master privileges for that receiver. From a security perspective, this is not always desirable. To overcome the potential security issue, the system has the ability to ‘demaster’ remote buttons.

1. Press and hold the master button that is associated with the same functionality as the buttons that need to be demastered. The master button must be pressed for between 20 and 30 seconds.
2. After a long double-beep indicates that 20 seconds have elapsed, release the button. Ignore the single beep at 10 seconds.
3. The receiver will remain in Demastering Mode for a period of 10 seconds failing any additional button presses.
4. Press and hold the button you wish to demaster for a minimum of three seconds.
5. Any transmitter button which is pressed will be acknowledged with a short beep.
6. A short triple-beep acknowledges the demastering operation, but the button is only demastered once it is released.
7. If no additional buttons are pressed within the 10 seconds Demastering Period, the receiver will automatically exit demaster mode. This exit is signalled by an extended single beep. The Status LED also stops flashing and resumes its responsibilities in normal mode.
10. Deleting Buttons

To delete transmitter buttons, follow the steps detailed below:

1. Follow the steps to enter Demastering Mode. For reference follow steps 1 through 4 in the Demastering Button section. The Demastering Mode channel need not be the same as the channel associated with the button that must be deleted.
2. While in Demastering Mode press and hold the button that must be deleted for between 10 and 20 seconds.
3. After holding down the button for 10 seconds, the receiver will emit a short beep.
4. After the short beep the button must be released.
5. The receiver indicates a successful deletion operation with four short beeps.

Once deleted, the system transitions back to Demastering Mode. Further buttons may be deleted following steps 2 through 7.

Remember the system must remain in demastering mode to delete buttons.

7. If no additional buttons are pressed within the 10 seconds demastering period, the receiver will automatically exit demastering mode. This exit is signalled by an extended single beep. The Status LED also stops flashing and resumes its responsibilities in normal mode.

11. Link Learning

Link Learning is the learning process associated with fitting a plastic link over the J1 pin and the common (middle) pin on the receiver in order to learn remote buttons into memory. Learning buttons using this method will also activate the specified output.

1. Fit the link J1 with power on the receiver.
2. When Jumper J1 is fitted, the LED will turn on as per Master Mode.
3. If the jumper button is new, the LED will flash (64 milliseconds on/448 milliseconds off) to register that the button transmission is being received, and that the button is a demastered.
4. The LED will then turn on again at the end of the operation.
5. Once the demastering period has elapsed (minimum 3 seconds), the LED will flash (64 milliseconds on/448 milliseconds off) to register that the button transmission is being received, and that the button is demastered.

5. When the demastering button is released, the receiver will complete the remastering operation and remaster the button. A single short beep will be emitted at the end of the operation, confirming to the user that the button has been remastered. The LED will turn on again at the end of the operation.
6. To ensure that this is done before the 5 second timeout period elapses.

12. Link Erase Mode

There are two primary types of erase that pertain to all the receiver variants:

1. **Transmitter Memory Erase**
   - **Settings Memory Erase**

   The procedure to perform the erase operation is documented below:

   1. Start with the receiver powered up.
   2. Fit a link bridging J2 and the common (middle) pin.
   3. The LED will flash 10 times to indicate that it is about to enter the erase procedure.
   4. After the LED has flashed 10 times, it will turn on. The procedure may still be aborted at this late stage by removing power to the receiver.
   5. Remove the link across jumper J2 and the middle pin to complete the erase operation.
   6. The LED will switch off once the relevant memory section is erased.
   7. The receiver will return to normal operation after the erase operation completes.

13. Remastering Buttons

If a button has been demastered, it can be remastered. There are two methods to achieve this, namely:

**Link Learn Remastering**

1. To remaster a remote in this mode, start by entering Link Learn Mode. For reference follow steps 1 and 2 in the Link Learning section.
2. With the link learn fitted, press and release a demastered button to remaster it. If a new button (button not learnt into the system) is pressed in Link Learn Mode, it will be learnt into the system (refer to the previous section, Link Learning for more information).
3. The leading edge of the demastered button transaction is acknowledged with a short beep. This beep occurs irrespective of whether the button is in memory or not.
4. While the demastered button is held down, the LED will flash (64 milliseconds on/448milliseconds off) to register that the button transmission is being received, and that the button is a demastered.
5. The demastering button is released, the receiver will complete the remastering operation and remaster the button. A single short beep will be emitted at the end of the operation, confirming to the user that the button has been remastered. The LED will turn on again at the end of the operation.
6. When Jumper J1 is removed the receiver will exit Link Learn Mode.

**Master Learn Remastering**

1. To remaster a remote in this mode, start by entering Master Learn Mode.
2. Press and hold a demastered button for a minimum of 3 seconds to remaster it. If a new button (button not learnt into the system) is pressed in Master Learn Mode, it will be learnt into the system (refer to the section, Learning Additional Transmitters for more information).
3. This beep occurs irrespective of whether the button is mastered or demastered.
4. While the demastered button is held down within the demastering window (minimum 3 seconds), the LED will flash (64milliseconds on/448milliseconds off) to register that the button transmission is being received, and that the button is demastered.
5. The demastering period has elapsed (minimum 3 seconds), the LED will turn on and the buzzer will provide a single short beep. This serves as visual and audible confirmation that the receiver has learnt the button being pressed. The LED will turn on again at the end of the operation.
6. Once remastered, the system transitions back to Master Learn Mode.
7. Further buttons may be remastered by following steps 3 through 6.
8. If no additional buttons are pressed within the 10 seconds Master Learn Mode period, the receiver will automatically exit remastering mode.

14. Advanced Features

**Bulk Demastering**

Since all buttons that have been added with master privileges, the HELIX offers a facility whereby certain groups of buttons, currently learnt into the receiver, can be demastered simultaneously.

This is an important feature since having multiple masters might at times be confusing or problematic. To demaster bulk remotes, follow the procedure highlighted below:

1. Ensure that there is no power on the receiver.
2. Single-channel receivers always bulk demaster all buttons because there is only one channel compartment.
3. Fit the link across J1 and the middle pin and power up the receiver.
4. After the firmware version number has flashed on the Status LED, the LED will begin to flash quickly to signal that the receiver has entered Bulk Demaster Mode. If the LED does not flash quickly then the system is not in Autolearn mode because jumper J1 was not correctly power-up before, or because there are no buttons learnt into memory.
5. To confirm the bulk demastering operation, jumper J1 must be removed. If the receiver is powered down before the jumper is removed, the bulk demastering operation is not executed. It is useful if the mode is entered accidentally and no buttons must actually be remastered.

**Autolearn Mode**

Autolearn functionality allows the receiver to remain in Learn Mode for a maximum period of 7 days, after which it will automatically time-out. This is useful in cases where not all individuals who have been issued with remotes are present in order to access their remotes into the receiver’s memory. Power down the receiver prior to commencing the procedure for entering Autolearn Mode.

1. Fit the link across J1 and power up the receiver. One of two possible situations will result:
   a. The receiver memory is blank. In this case the system enters the Autolearn Commissioning procedure. The receiver remains in this state while the link on J1 remains fitted. While in the commissioning state, the LED on the receiver remains on. Entry to the commissioning state is also signalled by a long beep from the buzzer. Continue to step 2.
   b. The receiver memory is not blank. In this case the system enters Bulk Demaster Mode. Refer to the section with the title, Bulk Demastering, for more information on the behaviour of the system.
2. Press a button on a transmitter
3. Once the association table has been finalised, remove jumper J1.
4. This confirms the mapping and enters Autolearn Mode. The buzzer will continue to beep at intervals to complete the transition to Autolearn mode.
5. While in Autolearn mode, the LED will remain on while the system is idle. When the correct transmitter button (only buttons registered in the association table are accepted) is pressed, the LED will turn off. When the button is released, the LED will turn on.

15. Output Configuration

Channel settings modify the way a receiver output responds when it is activated. The receiver can be configured to act as a latching output, a panic output or any combination thereof. A panic output provides the required drive logic for alarm or equivalent output functionality. Every button transmitter associated with a latching output will toggle the current output state of the channel.

16. Non-Volatile Latches (Sticky Latches)

This is a special feature on all receiver variants that allows the receiver to restore its output state on power loss. When power is restored, the output will assume the state it last reflected to the receiver before being powered down. Normally a receiver that has latched channels will always power-up with the channels unlatched; regardless of the output state of the channel prior to power loss. If a receiver latch feature addresses this problem (in applications where it is seen as a problem), and restores the output state of the latch to its state prior to power-loss.

17. Disabling the Learn Jumpers

It is possible to disable the functionality associated with jumper J1 and J2. This can be done by bridging jumper J2, this will activate the specified output. Once the jumper has been bridged, it will remain active even when power is removed from the board. In either of the two cases, the correct procedure is to fit the jumper across J1 to disable the functionality associated with the receiver. If the jumper across J1 is removed, the functionality associated with the jumper will be restored.

The following procedure documents disabling the jumper interface on the various models of receivers:

1. At least one master transmitter must be learnt into the receiver memory.
2. Press and hold a master button for between 20 and 30 seconds. This will cause the receiver to enter demastering mode; a single beep at 10 seconds must be ignored, and the button can be released upon hearing a single beep.
3. While in this mode, fit the link between J2 and the middle pin. The Status LED will remain on as long as the pins are bridged.
4. While Jumper J2 is removed the function will be disabled and no further jumper operations may be performed.

To re-enable the jumper interface, repeat steps 1 through 4 again.