



# Yulock™ User Guide

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## Welcome to Yulock™

Congratulations on your purchase of Yulock™ device. We are confident you will enjoy both – the convenience and unprecedented security Yulock™ Universal Key System provides<sup>1</sup>.

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<sup>1</sup> US Patent pending.

## 1. Getting Started

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### 1.1. Overview

There are plenty of products on the market today, offering remote keys for everything: certainly cars and garages, but also for entry doors. Some of the products use RF signal, some infrared. The ones using RF send pre-programmed code. The security of the latter significantly improved in recent years, once the length of the code increased, and it became harder to guess.

However, the remote RF keys are still vulnerable to eavesdropping by thief, who can plant RF detecting device in close proximity, and steal the code.

Another often annoying inconvenience is that ability to open many doors requires either hauling around large number of keys, or several remotes.

This invention aims to introduce universal key system, offering ability to operate as many locks as necessary with the single device that can use electronic cryptographically enforced key. It would be very nice, if some ubiquitous device, which everyone carries around anyway, could do the job.

### 1.2. Introducing Yulock™

There actually is such a device: cell phone. Many cell phones on the market today offer “Bluetooth”: short distance (mostly up to 30 feet) digital RF communication protocol, used to communicate to headsets, owners’ computer(s), hands free car phone kits, etc.. The number of cell phone models on the market offering Bluetooth snowballed in the past year, and it appears that in a short while there will be practically no cell phones without one.

On the other side, most phones are also “smart”, i.e. applications can be developed to run on the phone.

Phone application called “Yulock”, providing an “electronic key” capability has been developed by Yulock Inc.. In order for Yulock™ to be able to control a lock, electronic add-on device, also built by Yulock Inc., has to be installed. The device attaches to the lock, and has ability to communicate with the Yulock™ application on the cell phone via Bluetooth protocol at the distance of 30 feet or less with the standard antenna option, and up to 80 feet with the extended antenna

option. It also has ability to authenticate an electronic key on the cell phone using cryptography. Once the authentication succeeds, the lock will accept commands from the cell phone.



Figure 1 Universal Remote key on the cell phone using Bluetooth<sup>2</sup>.

### 1.3. How to Start Using Your Yulock™ Device

Yulock™ device can control up to two different doors. Currently entry and garage doors are supported. In the future Yulock™ devices will also be available for automobiles. Currently (Fall 2006) only Palm™ Treo phone is supported.

Follow these steps to start using your Yulock™:

1. Download Yulock.prc file and install on your Palm™ Treo phone<sup>3</sup>.
2. To assign speed button to invoke Yulock™ go to Treo's preferences, and under "Personal" tap "Buttons". Frequently users prefer "Press + Hold Side button" for the Yulock™ application speed button.
3. Install your Yulock™ device. Plug the wall outlet power supply provided into Yulock™ device and to wall outlet. Press and

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<sup>2</sup> Presented images are for illustration purposes only, and do not show actual phone used (at this time Palm Treo 650).

<sup>3</sup> Follow your Palm™ Treo phone user manual directions to install.

release Yulock™ device side button to see red light go on and thus verify that the device is functioning. Press and release again or wait to have the red light go off.

4. Connect each of the two pairs of wires plugged into your Yulock™ device to one of the two locks you will be operating. If only operating one device – ignore the second pair of wires.
5. If operating garage doors – connect the wires to the two screws inside the manual control button for your garage doors.
6. If operating entry doors – purchase 12V electric door strike, and install it in the jambs of your entry doors. Connect a pair of wires out of Yulock™ to the door strike.
7. Secure Yulock™ device to the wall using two screws and two pinhole openings on the back of the device. The best location in the garage is on the top of garage doors. The best location for the entry doors is at the side of the doors. If using single Yulock™ device for the doors removed from each other – pick a location closest to the point where you pass on the way to either door<sup>4</sup>.
8. Configure your Yulock™ software on the Palm™ Treo phone:
  - Activate control button(s) on the main menu
  - Link each control button on the menu to its own device
  - Either enter your cell phone's ID and password into Yulock™ device
  - Or configure options and initialize Yulock™ device(s)

The following is more detailed description of each of the steps above in the configuration of Yulock™ software on the Palm™ Treo phone.

#### **Activate control button(s) on the main menu**

- Invoke Yulock™ software on the Palm™ Treo phone (if configured speed button – press and hold the side button after turning phone on). The main Yulock™ form appears without

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<sup>4</sup> Yulock Inc. is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate Yulock™ device.

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any control buttons if none were configured before (see the diagram in Figure 2 below).

- Tap the “Manage Users” button – “Manage Users” form appears (see the diagram in Figure 3 below). Fill “User ID” and “Password” textboxes and tap “OK”. Your newly selected ID and password are memorized by the Yulock™ software on the Palm™ Treo phone (but not yet on any of the devices).

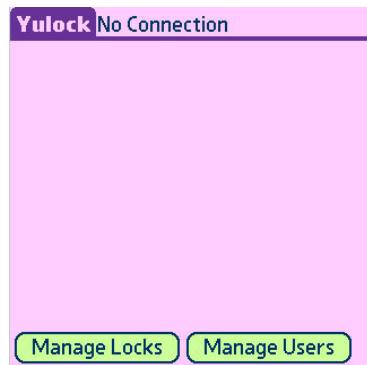


Figure 2. Main Yulock™ form before any control buttons are configured.

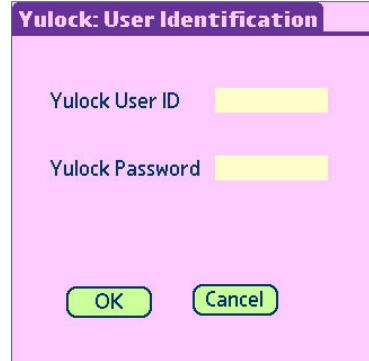
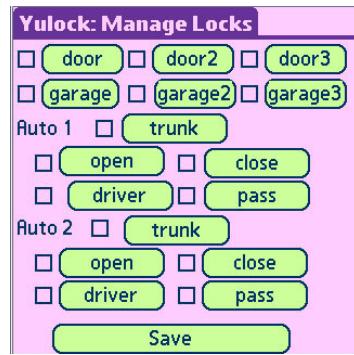


Figure 3. Manage Users Yulock™ form.

- Back at the main Yulock™ form tap “Manage Locks”. “Manage Locks” form appears (see diagram in Figure 4 below).

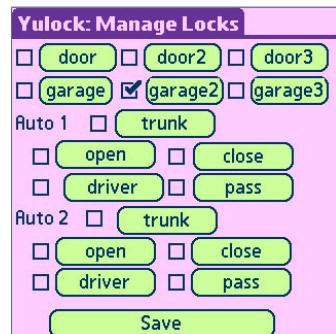
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The screenshot shows the 'Manage Locks' screen of the Yulock app. It has a pink header bar with the title 'Yulock: Manage Locks'. Below the header, there are two rows of checkboxes for doors and garages. Under each row, there is a section for 'Auto 1' and 'Auto 2' with a 'trunk' checkbox. Each auto section contains two rows of buttons: 'open' and 'close' on the top row, and 'driver' and 'pass' on the bottom row. At the bottom of the screen is a green 'Save' button.

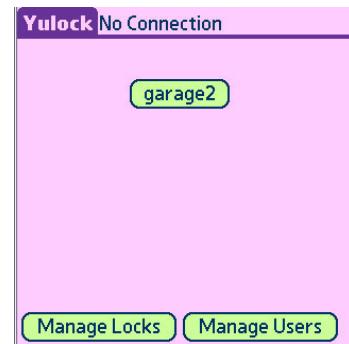
Figure 4. Manage Locks Yulock™ form.

- Check any of the door or garage checkboxes preferred to activate these control buttons back on the main Yulock™ form. There will be opportunity to change button titles in one of the steps below.
- Tap “Save”, and all control buttons checked appear (see the diagrams in Figure 5 and Figure 6 below).



This screenshot shows the 'Manage Locks' screen with the 'garage2' checkbox checked. The 'garage2' checkbox is highlighted with a green border and a checkmark. The rest of the interface is identical to Figure 4, with other checkboxes and buttons in their original state.

Figure 5. Manage Locks Yulock™ form: “garage2” checked.



The screenshot shows the main Yulock screen with the title 'Yulock' and a 'No Connection' message. In the center, there is a green button labeled 'garage2'. At the bottom of the screen are two green buttons: 'Manage Locks' and 'Manage Users'.

Figure 6. Main Yulock™ form: “garage2” button appears.

## Link to each control button on the menu to its own Yulock™ device

- At the main Yulock™ form tap “Manage Locks”. Once at “Manage Locks” form - tap the button to be linked to the device (say garage2 button on the diagram in Figure 5 above). “Add/Edit Lock” form appears (see diagram in Figure 7 below).
- Edit button title to your liking.
- Choose the type of the door controlled by this Yulock™ device – “Entry”, or “Garage”.



Figure 7. Add/Edit Yulock™ form.

- Choose the number – 1 or 2 – of the lock that will be controlled by the button being now configured<sup>5</sup>.
- Tap “choose lock”. Bluetooth selection dialog appears. Select “nearby devices” in the “show” window, and pick your Yulock™ device from the list, followed by taping “OK”. “Add/Edit Lock” form comes back. The Yulock™ device to be controlled has to be powered on, and within control distance from the cell phone.
- Tap “OK” – “Manage Locks” form comes back.
- Tap “Save” – Main form comes back.

Now your new button title will show on the button just configured, and your Yulock™ device is linked with the button (Figure 8 below).

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<sup>5</sup> If you control only one lock - use either lock #1 or #2 and correct wires.

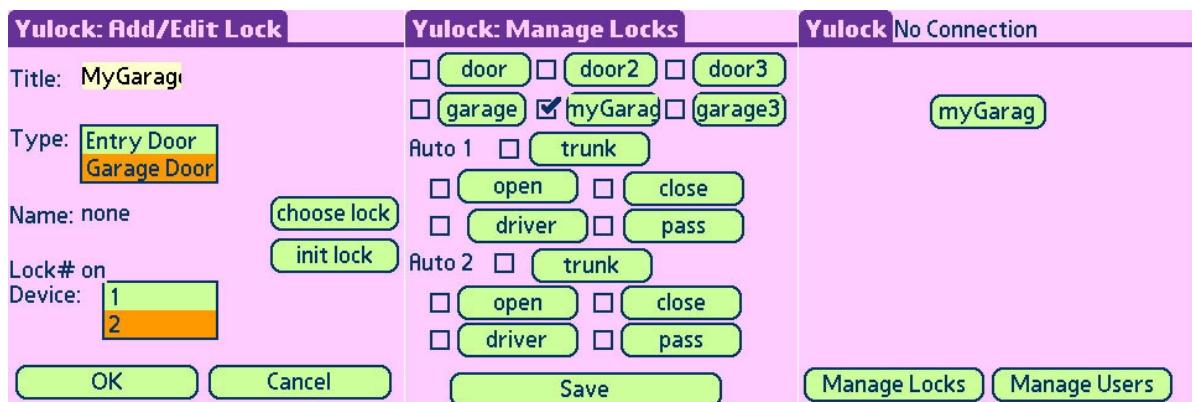


Figure 8. Changing button title.

### Enter your cell phone's ID and password into Yulock™ device

If Yulock™ device had been initialized before you only need to have your cell phone send its ID and Password to the device to memorize. In order to do that:

- Bring up Yulock™ software's main form.
- Press and release a button on the side of Yulock™ device, so that red light is on (make sure Yulock™ device is powered).
- While the red light is on, tap on the button on the cell phone's main menu just configured to control Yulock™ device.
- The dialog will appear on the cell phone requesting to enter pin. Enter the pin you entered during initialization of your Yulock™ device and tap "OK".
- The device will trigger door opening (either entry or garage door), and will memorize ID and Password.
- Press and release Yulock™ device's side button again, or simply wait – red light goes off and Yulock™ device will remember new ID and password.

### Initialize your Yulock™ device

Before your Yulock™ device can be operated securely – it has to be initialized, so that the pin in it is not known to anyone but you and other people you wish to authorize. If you do not perform initialization – the pin will stay as shipped by Yulock™ Inc.

Also – if you did initialize your Yulock™ device before – you can always initialize it again, if you wish to change pin again and/or to remove all ID and passwords in it and start over. In additiona initialization allows to change device name and opening time for entry doors.

These are the steps to take to initialize your Yulock™ device:

- Invoke Yulock™ application on your cell phone.
- On the main Yulock™ form tap “Manage Locks” – “Manage Locks” form appears.
- On the “Manage Locks” form tap the button linked to your Yulock™ device – “Add/Edit lock” form appears. If you have two buttons linked to the same Yulock™ device – tap either one of them. You have to had linked Yulock™ device to the button(s) before – see steps for linking above.
- On the “Add/Edit lock” form tap “init lock” – “Init Lock” form appears (see Figure 9 below).



Figure 9. Init Lock form.

- Choose the name of your Yulock device and type it in.
- If controlling entry door – enter desired wait time<sup>6</sup>.
- Enter the pin. Pin has to be entered even if the same one as before is used. Current pin would not show for security reasons.
- Tap “OK” (see diagram in Figure 9 above). Initialization process will take a few seconds.

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<sup>6</sup> Wait time is the time the entry door lock will stay open once commanded to open. Garage door configuration does not have wait time.

## 2. Compliance

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### RF Radiation Exposure

Yulock™ device complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### Receiver Statement

Yulock™ device has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. This specification's limits are designed to provide reasonable protection against harmful interference in a residential installation. Yulock™ device generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, 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, which is found 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 antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance