

Integration of Raspberry Pi on Create

Use this guide in addition to the “Converting Create to Use RealSense.pdf” document by Alec Newport (acn55) & Zhilong Li (zl242).

You will need access to the Lab Admin Folders drive, and the AMR github.

Changes to assembly:

1. Power regulator:

- a. DC to DC adapter

https://www.amazon.com/dp/B00QTJWRFW?ref_=pe_1815430_211938580

- b. D25 plug connector

<https://www.mcmaster.com/2146t58>

Solder the regulator input wires to the battery power pin and GND pin according to the Create cargo bay connector pinout.

2. Platform:

Modified by Patrick to leave 4 mounting holes and 2 holes for the camera bracket. The drawing is in ...\\Lab Admin Folders\\MAE 4180\\Spring 19 Realsense and RasPi\\Platform drawing.

3. Camera bracket:

Machined by Joe Adas. Drawing in

...\\Lab Admin Folders\\MAE 4180\\Spring 19 Realsense and RasPi\\Camera\\Bracket.

4. Pi enclosure and Power regulator attached underneath the platform with Velcro.

Camera:

1. Update Firmware:

Firmware Updater, firmware bin file and instructions found in

...\\Lab Admin Folders\\MAE 4180\\Spring 19 Realsense and RasPi\\Camera\\Firmware update

Network:

1. TP-Link Access point:

AP information in ...\\Lab Admin Folders\\Computer Support\\TP-LINK Access Point

SSID = AMR_wifi

Password = 4180-5180

MicroSD card image:

1. Configure auto login to user 'create', so it doesn't wait before connecting to wifi:
Edit /usr/share/lightdm/lightdm.conf.d/60-lightdm-gtk-greeter.conf
Add 'autologin-user=create' in the end of the file.
2. Remove password requirement for sudo for user 'create':
sudo visudo (to edit /etc/sudoers)
Add as the LAST line: 'create ALL = NOPASSWD : ALL'
3. Disable Bluetooth and keep turbo mode in low voltage:
Edit /boot/config.txt
Add 'dtoverlay=pi3-disable-bt' and 'avoid_warnings=2' to the end of the file
4. Change account password if needed:
System – Administration – Users and Groups
Password is 'AMRobot'
5. Automatic Wifi connection settings:
 - a. Edit /etc/network/interfaces
Before 'auto lo' add
 'auto wlan0'
In the end of the file add
 'allow-hotplug wlan0'
 'iface wlan0 inet dhcp'
 'wpa-conf /etc/wpa_supplicant/wpa_supplicant.conf'
 - b. Edit /etc/wpa_supplicant/wpa_supplicant.conf (create the file if it doesn't exist)
Add
 network={
 ssid="AMR_wifi"
 psk="4180-5180"
 }
5. Disable sound:
Edit /etc/modprobe.d/raspi-blacklist.conf
Add 'blacklist snd_bcm2835'

Python files:

1. Download the latest version of the two python scripts on the Pi from Github:
<https://github.com/autonomousmobilerobots/>
Copy the 'raw' address from git. SSH with Putty and use 'wget <address>'
Save 'robot' to create home
Save 'RsonCreate.py to create/apriltag/python'

Clone the MicroSD card:

1. On Windows use Win32DiskImager: <https://sourceforge.net/projects/win32diskimager/>
2. On the Pi use rpi-clone
3. See How To in
 ...\ Lab Admin Folders\MAE 4180\Spring 19 Realsense and RasPi\Raspberry Pi Image