**System with STM32 nucleo Development board**

Products cost estimation

| Product | Price | Website |
| --- | --- | --- |
| STM32 Nucleo F411RE Development Board | CA$ 20 | <https://www.ebay.ca/itm/175347199602?chn=ps&norover=1&mkevt=1&mkrid=706-159614-043509-9&mkcid=2&mkscid=101&itemid=175347199602&targetid=4586269160971572&device=c&mktype=&googleloc=&poi=&campaignid=414169804&mkgroupid=1322713655057161&rlsatarget=pla-4586269160971572&abcId=9300552&merchantid=136822&msclkid=af00734903df128a206f1768d5f011fe> |
| Soil Humidity Hygrometer Moisture Detection Plant Water Sensor Module Arduino | CA$ 7.50 | <https://www.ebay.ca/itm/255337374973?chn=ps&norover=1&mkevt=1&mkrid=706-159614-043509-9&mkcid=2&mkscid=101&itemid=255337374973&targetid=4586269160971568&device=c&mktype=&googleloc=&poi=&campaignid=414169804&mkgroupid=1322713655057161&rlsatarget=pla-4586269160971568&abcId=9300552&merchantid=136822&msclkid=baecb654a40c1e0d1ae4d277f4d403f2> |
| Mini Water Pump and Tube | CA$ 16.99 | <https://www.amazon.ca/WayinTop-Submersible-Flexible-Fountain-Aquarium/dp/B07TMW5CDM/ref=asc_df_B07TMW5CDM?tag=bingshopdesk-20&linkCode=df0&hvadid=80814196245904&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4584413744730078&psc=1> |
| 4 Solid State Relay | CA$ 14.64 | [4 Channel Solid State Relay Module Board 5V DC-AC High Level Trigger with Fuse 2A : Amazon.ca: Industrial & Scientific](https://www.amazon.ca/Channel-Solid-State-Module-Trigger/dp/B07RBM4FLJ/ref=sr_1_3_sspa?crid=SPMYX7045QZ2&keywords=4+Solid+State+Relay&qid=1679948655&sprefix=4+solid+state+relay+%2Caps%2C75&sr=8-3-spons&psc=1&smid=AZQKFHQ1B8MYJ&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUExS1VGNkhaNzM3NDdCJmVuY3J5cHRlZElkPUEwMzQzODU4MkxYSlhJNEdYSVJJSiZlbmNyeXB0ZWRBZElkPUEwNzQ0MTQyMlk0NFpZSFpIWkpTSiZ3aWRnZXROYW1lPXNwX2F0ZiZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=) |
| Jumper Cable | CA$ 9.97 | <https://www.amazon.ca/RGBZONE-Multicolored-Breadboard-Arduino-Raspberry/dp/B08TWSV2DY/ref=asc_df_B08TWSV2DY?tag=bingshopdesk-20&linkCode=df0&hvadid=80470598952928&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4584070154163228&psc=1> |
| LED Light | CA$ 4.58 | <https://www.temu.com/ca/200pcs-led-diode-lights-3mm-5mm-led-lights-emitting-diodes-assortment-set-kit-white-red-blue-green-yellow-diy-led-diode-set-g-601099513691008.html?_bg_fs=1&_p_rfs=1&_x_ads_channel=google&_x_ads_sub_channel=shopping&_x_login_type=Google&_x_vst_scene=adg&mkt_rec=1&goods_id=601099513691008&sku_id=17592197918347&_x_ns_sku_id=17592197918347&_x_gmc_account=695390730&no_cache_id=vxa65> |
| 10k Potentiometer | CA$ 2.16 | <https://www.digikey.ca/en/products/detail/bourns-inc./PDB181-E420F-103B1/3820276?utm_adgroup=Scale%20Dials&utm_source=bing&utm_medium=cpc&utm_campaign=Shopping_Product_Potentiometers%2C%20Variable%20Resistors&utm_term=&utm_content=Scale%20Dials&utm_id=bi_cmp-384475335_adg-1304021015492456_ad-81501362628372_pla-4585100930878254_dev-c_ext-_prd-3820276&productid=3820276&msclkid=39487b48b6d51fce89811f6953eb4cfe> |
| Non-Contact Liquid Level Sensor | CA$ 16.00 | <https://www.amazon.ca/Transmitter-XKC-Y25-NPN-Intelligent-Non-Contact-Detection/dp/B07DRCXWYZ> |
| MQ135 MQ-135 Air Quality Sensor | CA$ 3.48 | [MQ135 MQ-135 Air Quality Sensor Hazardous Gas Detection Module | eBay](https://www.ebay.ca/itm/195564338547?chn=ps&norover=1&mkevt=1&mkrid=706-159614-043509-9&mkcid=2&mkscid=101&itemid=195564338547&targetid=4586269160971568&device=c&mktype=&googleloc=&poi=&campaignid=414169804&mkgroupid=1322713655057161&rlsatarget=pla-4586269160971568&abcId=9300552&merchantid=136822&msclkid=5d50bbccde111f60ca34dfef87f2e43b) |
| DHT11 Digital Temperature and Humidity Sensor | CA$ 5.95 | <https://www.ebay.ca/itm/265931676585?chn=ps&norover=1&mkevt=1&mkrid=706-159614-043509-9&mkcid=2&mkscid=101&itemid=265931676585&targetid=4586269160971568&device=c&mktype=&googleloc=&poi=&campaignid=414169804&mkgroupid=1322713655057161&rlsatarget=pla-4586269160971568&abcId=9300552&merchantid=136822&msclkid=a21a3aeabe9517a30fa65ecb5c806aec> |
| Fan for greenhouse cabinet | CA$ 65.29 | [12V 10W USB Fan Ventilator For Greenhouse Cat/Dog Chicken House Solar Powered – Grandado](https://can.grandado.com/products/12v-10w-usb-fan-ventilator-for-greenhouse-cat-dog-chicken-house-solar-powered?variant=UHJvZHVjdFZhcmlhbnQ6MjA0NzAwNzEx&msclkid=8e3e94edccde11ed95c6607e1de53bae) |
| Heater for greenhouse cabinet | CA$ 32.22 | [120-240V PTC Heater Cabinet Heater Air Heater HG040-75W Electric Thermostatic Heater : Amazon.ca: Home](https://www.amazon.ca/Cabinet-HG040-75W-Electric-Thermostatic-120-240V/dp/B07VMMZ2H2/ref=asc_df_B07VMMZ2H2?tag=bingshopdesk-20&linkCode=df0&hvadid=80401879906838&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4584001427113983&psc=1) |
| Air Humidifier for greenhouse cabinet | CA$ 25.99 | <https://www.amazon.ca/WHDTS-Ultrasonic-Atomizer-Transducer-Humidifier/dp/B073322QF8/ref=asc_df_B073322QF8/?tag=googleshopc0c-20&linkCode=df0&hvadid=366262351363&hvpos=&hvnetw=g&hvrand=5912034527552883193&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9000906&hvtargid=pla-437604235385&th=1> |
| Total | CA$ 224.77 |  |

**System with Arduino board**

Basically, the controller board is different for both systems, otherwise, the other components are the same for both of these systems.

Products cost estimation

| Product | Price | Website |
| --- | --- | --- |
| UNO R3 Controller Board | CA$ 23.99 | [ELEGOO UNO R3 Board ATmega328P with USB Cable(Arduino-Compatible) for Arduino : Amazon.ca: Electronics](https://www.amazon.ca/Elegoo-Board-ATmega328P-ATMEGA16U2-Arduino/dp/B01EWOE0UU/ref=asc_df_B01EWOE0UU?tag=bingshopdesk-20&linkCode=df0&hvadid=80745476895412&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4584345031384272&psc=1) |
| Soil Humidity Hygrometer Moisture Detection Plant Water Sensor Module Arduino | CA$ 7.50 | <https://www.ebay.ca/itm/255337374973?chn=ps&norover=1&mkevt=1&mkrid=706-159614-043509-9&mkcid=2&mkscid=101&itemid=255337374973&targetid=4586269160971568&device=c&mktype=&googleloc=&poi=&campaignid=414169804&mkgroupid=1322713655057161&rlsatarget=pla-4586269160971568&abcId=9300552&merchantid=136822&msclkid=baecb654a40c1e0d1ae4d277f4d403f2> |
| Mini Water Pump and Tube | CA$ 16.99 | <https://www.amazon.ca/WayinTop-Submersible-Flexible-Fountain-Aquarium/dp/B07TMW5CDM/ref=asc_df_B07TMW5CDM?tag=bingshopdesk-20&linkCode=df0&hvadid=80814196245904&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4584413744730078&psc=1> |
| 4 Solid State Relay | CA$ 14.64 | [4 Channel Solid State Relay Module Board 5V DC-AC High Level Trigger with Fuse 2A : Amazon.ca: Industrial & Scientific](https://www.amazon.ca/Channel-Solid-State-Module-Trigger/dp/B07RBM4FLJ/ref=sr_1_3_sspa?crid=SPMYX7045QZ2&keywords=4+Solid+State+Relay&qid=1679948655&sprefix=4+solid+state+relay+%2Caps%2C75&sr=8-3-spons&psc=1&smid=AZQKFHQ1B8MYJ&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUExS1VGNkhaNzM3NDdCJmVuY3J5cHRlZElkPUEwMzQzODU4MkxYSlhJNEdYSVJJSiZlbmNyeXB0ZWRBZElkPUEwNzQ0MTQyMlk0NFpZSFpIWkpTSiZ3aWRnZXROYW1lPXNwX2F0ZiZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=) |
| Jumper Cable | CA$ 9.97 | <https://www.amazon.ca/RGBZONE-Multicolored-Breadboard-Arduino-Raspberry/dp/B08TWSV2DY/ref=asc_df_B08TWSV2DY?tag=bingshopdesk-20&linkCode=df0&hvadid=80470598952928&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4584070154163228&psc=1> |
| LED Light | CA$ 4.58 | <https://www.temu.com/ca/200pcs-led-diode-lights-3mm-5mm-led-lights-emitting-diodes-assortment-set-kit-white-red-blue-green-yellow-diy-led-diode-set-g-601099513691008.html?_bg_fs=1&_p_rfs=1&_x_ads_channel=google&_x_ads_sub_channel=shopping&_x_login_type=Google&_x_vst_scene=adg&mkt_rec=1&goods_id=601099513691008&sku_id=17592197918347&_x_ns_sku_id=17592197918347&_x_gmc_account=695390730&no_cache_id=vxa65> |
| 10k Potentiometer | CA$ 2.16 | <https://www.digikey.ca/en/products/detail/bourns-inc./PDB181-E420F-103B1/3820276?utm_adgroup=Scale%20Dials&utm_source=bing&utm_medium=cpc&utm_campaign=Shopping_Product_Potentiometers%2C%20Variable%20Resistors&utm_term=&utm_content=Scale%20Dials&utm_id=bi_cmp-384475335_adg-1304021015492456_ad-81501362628372_pla-4585100930878254_dev-c_ext-_prd-3820276&productid=3820276&msclkid=39487b48b6d51fce89811f6953eb4cfe> |
| Non-Contact Liquid Level Sensor | CA$ 16.00 | <https://www.amazon.ca/Transmitter-XKC-Y25-NPN-Intelligent-Non-Contact-Detection/dp/B07DRCXWYZ> |
| MQ135 MQ-135 Air Quality Sensor | CA$ 3.48 | [MQ135 MQ-135 Air Quality Sensor Hazardous Gas Detection Module | eBay](https://www.ebay.ca/itm/195564338547?chn=ps&norover=1&mkevt=1&mkrid=706-159614-043509-9&mkcid=2&mkscid=101&itemid=195564338547&targetid=4586269160971568&device=c&mktype=&googleloc=&poi=&campaignid=414169804&mkgroupid=1322713655057161&rlsatarget=pla-4586269160971568&abcId=9300552&merchantid=136822&msclkid=5d50bbccde111f60ca34dfef87f2e43b) |
| DHT11 Digital Temperature and Humidity Sensor | CA$ 5.95 | <https://www.ebay.ca/itm/265931676585?chn=ps&norover=1&mkevt=1&mkrid=706-159614-043509-9&mkcid=2&mkscid=101&itemid=265931676585&targetid=4586269160971568&device=c&mktype=&googleloc=&poi=&campaignid=414169804&mkgroupid=1322713655057161&rlsatarget=pla-4586269160971568&abcId=9300552&merchantid=136822&msclkid=a21a3aeabe9517a30fa65ecb5c806aec> |
| Fan for greenhouse cabinet | CA$ 65.29 | [12V 10W USB Fan Ventilator For Greenhouse Cat/Dog Chicken House Solar Powered – Grandado](https://can.grandado.com/products/12v-10w-usb-fan-ventilator-for-greenhouse-cat-dog-chicken-house-solar-powered?variant=UHJvZHVjdFZhcmlhbnQ6MjA0NzAwNzEx&msclkid=8e3e94edccde11ed95c6607e1de53bae) |
| Heater for greenhouse cabinet | CA$ 32.22 | [120-240V PTC Heater Cabinet Heater Air Heater HG040-75W Electric Thermostatic Heater : Amazon.ca: Home](https://www.amazon.ca/Cabinet-HG040-75W-Electric-Thermostatic-120-240V/dp/B07VMMZ2H2/ref=asc_df_B07VMMZ2H2?tag=bingshopdesk-20&linkCode=df0&hvadid=80401879906838&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-4584001427113983&psc=1) |
| Air Humidifier for greenhouse cabinet | CA$ 25.99 | <https://www.amazon.ca/WHDTS-Ultrasonic-Atomizer-Transducer-Humidifier/dp/B073322QF8/ref=asc_df_B073322QF8/?tag=googleshopc0c-20&linkCode=df0&hvadid=366262351363&hvpos=&hvnetw=g&hvrand=5912034527552883193&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9000906&hvtargid=pla-437604235385&th=1> |
| Total | CA$ 228.76 |  |

**To build this system Demo**

Estimation time to build the whole system - Approximately 3 weeks. (It is varies according to the purchased product arrival and Testing process)

| Task | Time | Parallel works timing |
| --- | --- | --- |
| Purchasing Products | First 1 week |  |
| Coding work |  | First 5 Days |
| Building the Demo System | Second week |  |
| Testing the system | Third week |  |