

# CMVTC Bus Camera Installation Guide on Thomas C2

Rev A



Because every mile matters.™

# Preparations - Gather all your tools

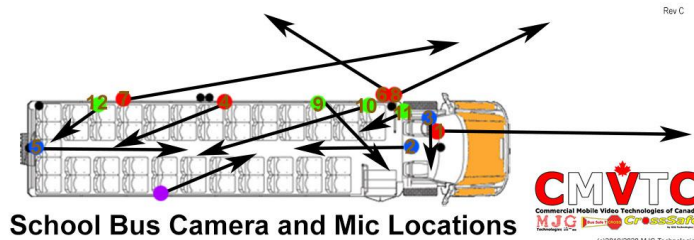
|                                   |                                                         |
|-----------------------------------|---------------------------------------------------------|
| Cordless drill                    | Solder Seal: Heat Shrink Gun                            |
| Robertson and Phillips screw bits | 22mm Hold Saw or Shallow Step Bit                       |
| Deep Sockets and Ratchet          |                                                         |
| Wire stripper/crimper             |                                                         |
| Side cutters                      | Review Included Installation Kit                        |
| Electrical tape                   | Review shipped items and familiarize yourself with each |
| Multimeter                        | Review the installation processes provided              |
| 2ea 10A ATC Fuses                 |                                                         |

# Pre-Install Notes

- ▶ Print & Read this document first. ☀
- ▶ Download and print the DVR Users Manual from [Downloads | CMVTC MJG Technologies](#) ☀
  - Be cautious to not drill into Bus wires or hoses.
  - Do not penetrate bus skin, unless installing CrossSafe cameras.
  - Determine and lay out your cameras and DVR near install locations.
  - Double check and add extra electrical tape to all connections.
  - Contact [Service Support | CMVTC MJG Technologies](#) for all service, support and training requests.
  - Be Cautious when connecting to Bus Power and Bus Wire Connections.

# Unpack and Spread Out

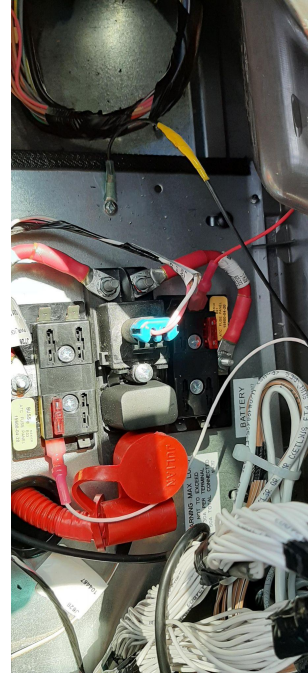
- Unpack all camera items
- Place DVR near its final location
- Place Cameras & Mics near install locations
- Plug in GPS Sensor into GPS on back of DVR
- Run and plug in Aviation cables into Cameras/Mic Y-Cable and correct DVR ports (Recommendation: Port 1/2 - Windshield Camera(s), Port 2 - Drivers Compartment, Port 3 - Front of Bus, Port 4 - Mid Bus, Port 5 - Rear of Bus, Port 6 - CrossSafe Env Cam, Port 7 - Front LP cam, Port 8 - Rear LP cam)
- Fish Power cable (4 wire) from DVR to Bus Power Source
- Fish Aviation cable(s) from DVR to LP Camera(s) and connect
- Fish Event Button cables (2 wire) from DVR to Event Button Location and plug in Red & Blue Buttons
- Plug Monitor into DVR (use RCA extension cable or adapters and DVR Video/Audio/Power adapter)
- Place Power & I/O Harness near DVR



# DVR to Bus Power Connections

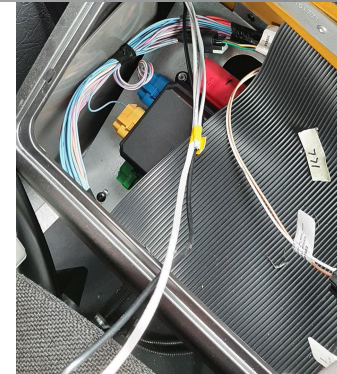
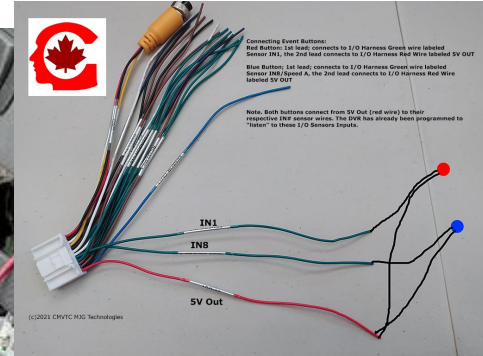
The DVR Main Power cable is the Cable with 4 wires (Red, Black, White & Green)

- Connect the DVR Power Harness Side
  - Harness Red to Cable Red
  - Harness Black to Cable Black
  - Harness Yellow to Cable White
- Pull the cable inside the Post Cable trough to the Power Panel under the Driver Switch Panel
- Pull LP Cameras and Button (2 wire cable) at the same time if possible
- Connect the Power wire to the Bus Power using a 10A ATC fuse (Confirm Bus Power points with your multimeter)
  - Cable Black to Bus Ground
  - Cable Red to Bus +12VDC Constant
  - Cable White to Bus Run/Aux
- Add 10A Fuses to power distribution panel
- **DO NOT Connect Power Harness to DVR**



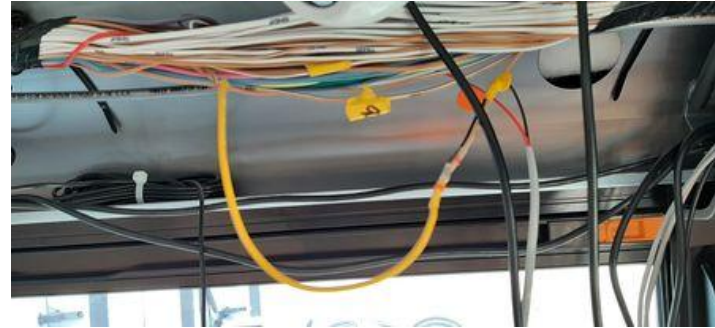
# Connect Event Buttons (Red & Blue)

- Connect Red Mini Blade connector from a cable to Red Button, connect the second cable to the Blue Button
- Pull Button cables to DVR I/O Harness
- Connect Black wire from both cables to +5VDC to DVR I/O Harness
  - Connect the Red Button Red wire to the Green IO1 IN Harness wire
  - Connect the Blue Button Red wire to the Green IO8 IN Harness wire



# Connect Sensors

- Sensors are connected to the DVR I/O Harness IO1 to IO8
  - IO1 = Red Event Button
  - IO2 = Ambers
  - IO3 = Flashing Reds
  - IO4 = Brakes
  - IO8 = Blue Event Button
- Using the white 2 wire cable, Tap into the Bus wires leading to the rear of the bus
- Identify and multimeter test the Bus signal wires to tap into. Different models may use different wires.
- Connect and tape each connection
- Use Crimp or Solder/Seal connections as required.
- Be sure that connections at Bus die and I/O Harness side are solid, stable and includes all connected I/O wires.



# Optional 4G/LTE & RFID

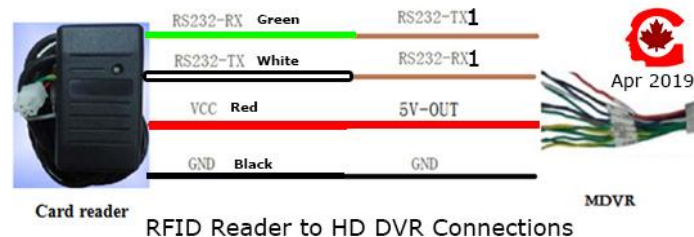
## 4G/LTE:

- Connect USB power Red to I/O harness **+5VDC** & Black to I/O Harness Ground
- Connect RJ45 Network Cable from 4G/LTE to DVR.
- Configure DVR for IVMS Server connection (may be preconfigured)
- Mount 4G/LTE on top of DVR (optional antenna extension cable available)



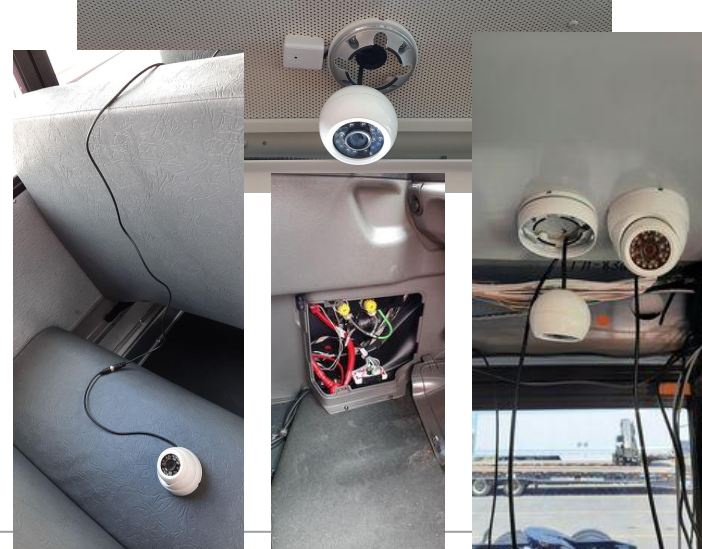
## RFID:

- Wire RFID to I/O Harness,
- Program DVR for RFID operation
- Mount RFID Reader near entrance door



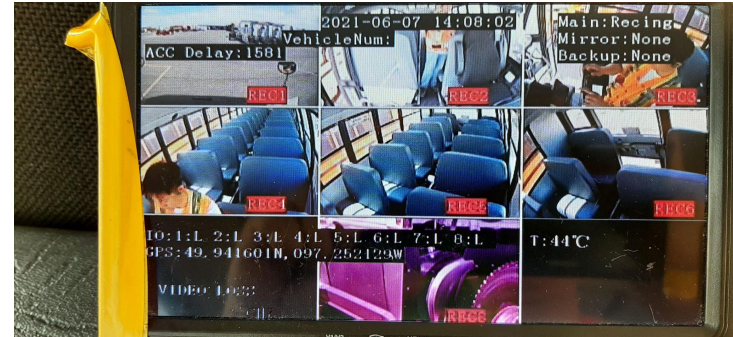
# Connection and final cable run preparation

- Double check all your connections
- Make sure all Cameras & Mics are plugged into the Aviation cable and plugged into the DVR in the correct ports (example)
  - Port 1/2 = Windshield Cam (Dual?)
  - Port 2 = Driver Compartment Cam or Front Isle
  - Port 3 = Front of bus
  - Port 4 = Mid Bus
  - Port 5 = Rear of Bus
  - Port 6 = CrossSafe Environment Cam
  - Port 7 = CrossSafe Front LP Cam
  - Port 8 = CrossSafe Rear LP Cam
- Double check Microphone connections on Y-Cable
- Double check GPS connection
- Double check the Red (Bus +12VDC) and Run/Aux Bus Power connections are fused with 10A fuse.
- Plug monitor into DVR front panel
- Make sure remote has good AAA batteries
- Plug DVR I/O Harness into DVR until it Clicks
- **Plug DVR Power harness into DVR until it Clicks**
- Power up bus (Run/Aux)
- DVR and Monitor will power up



# DVR, Camera & Mic Testing

- **Refer to DVR Users Manual for all DVR features and settings;**
- Using Remote
- Login, admin, pw; 888888
- General, Vehicle Info, Vehicle ID = Bus Number
- Date & Time; confirm Time, Timezone settings
- Record; Confirm camera connected port are On and Confirm record setting, others are Off.
- Return to main screen
- Verify time/date, Vehicle ID, all camera are visible and REC appears on on port that are connected to a camera. Are all cameras in the correct Port?
- Press 1 on the remote for port 1 to view camera 1 listen for the microphone (may have to tap on the Mic). Make sure volume is turned up on monitor. Repeat for all camera that have Mics.
- If any unsuccessful tests, go back and review connections, settings and correct.



# Run cables, mount hardware and tie down

- Prepare to mount Cameras & Mics
- **Note: Clean windshield well before affixing the Windshield Camera Mount to the windshield. (Center Top)**
- Drill 22mm holes if required, pull cable, add grommet to hole, plug in cable.
- Mount Camera with included #6 screws & Aim Cameras.
- Mount Mic near camera using the notch in the camera base.
- Repeat for all Cameras & Mics
- Pull and tiewrap cable with minimum pinch zones, long loops and sufficient tie wraps
- Make sure cable runs are clean and tiewrapped to other cable bundles
- Make sure all cables are taught but not tight.
- Make sure all cables are connected well to the DVR
- Use several Tiewraps at DVR and mount the cable cover.
- Using the long Velcro strips, Velcro DVR to clean bottom of overhead compartment with clean cable run.
- Test all camera & Mics
- Close all cable troughs, panels and button up



# Final Test and clean up

- Test DVR, Cameras, Mics GPS, Sensors and other with Monitor and Remote (Info button provides a lot of info)
- Clean all wires scraps, cables, parts and make sure bus is clean and tidy.
- Affix the Video Notice Decal we designated by your School Division Transportation Department.
- Document bus as passed, completed and ready to run.

Go To [Downloads | CMVTC MJG Technologies](#) to Download MDVR Player Program, User Manuals, Inspection Form, and additional installation CheatSheets.

**Congratulations on your successful  
CMVTC School Bus Mobile Video  
System Installation**

