

GROUND CONTROL SYSTEM (GCS)  
FIRMWARE DESIGN

## UAS/Robotics

Aux Out

Project  
Management



Mechanical  
Engineering



Systems  
Engineering



Electrical  
Engineering



Aux Out  
Cable

Hub

AC A  
Ca

Component Configuration

# PORT RTOS-BASED APPLICATION AND PERIPHERALS FOR UPDATED GCS

## APPROACH

- Determined key product requirements by reviewing and exercising the legacy system
- Updated existing real-time operating system (RTOS) application to run on Linux
- Conducted Ethernet root cause investigation
- Reimplemented MPEG-2 video pipeline

## RESULTS

- Implemented drivers, interfaces, and hardware abstraction layer (HAL)
- Increased product longevity and resolved hardware end-of-life concerns
- Implemented eMMC flash process for production manufacturing
- Built automated system tests for access through external ports

## KEY TECHNOLOGIES

- Yocto—Custom embedded Linux distribution
- Gstreamer — Pipeline-based multimedia framework
- Hardware-in-the-loop (HIL) testing
- NXP i.MX6 multicore processor with package on package (POP) memory

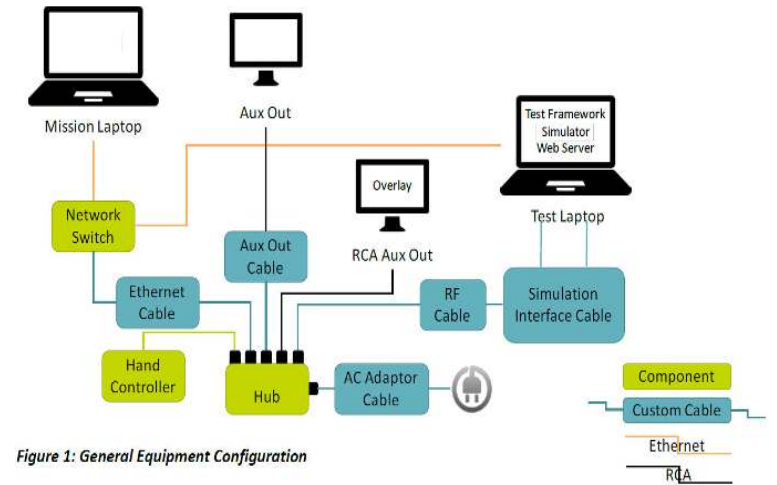


Figure 1: General Equipment Configuration