



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

Senior Design Project Description

Company Name	CommScope	Date Submitted	20 May 2018
Project Title	Automation Design for RJ-45 Jack Assembly (COMMS_RJ45)	Planned Starting Semester	Fall 2018

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project. 250 hours are expected per person.

Complete the following table if this information is known, otherwise the Senior Design Committee will develop based on the project scope:

Discipline	Number	Discipline	Number
Mechanical	4	Electrical	1
Computer		Systems	
Other ()			

Company and Project Overview:

CommScope (NASDAQ: COMM) helps companies around the world design, build and manage their wired and wireless networks. Our network infrastructure solutions help customers increase bandwidth; maximize existing capacity; improve network performance and availability; increase energy efficiency; and simplify technology migration.

You will find our solutions in the largest buildings, venues and outdoor spaces; in data centers and buildings of all shapes, sizes and complexity; at wireless cell sites; in cable head-ends and telco central offices; and in airports, trains, and tunnels. Vital networks around the world run on CommScope solutions.

Our size, reach, supply chain, operational precision, and responsive personnel power our advances into new forms of communication. This forward-thinking approach is supported by a long tradition of excellence—CommScope was instrumental in the creation of:

- Cable TV infrastructure
- The first wireless networks
- The first data centers
- The first intelligent buildings

Some sample products designed and built at the CommScope Greensboro location:



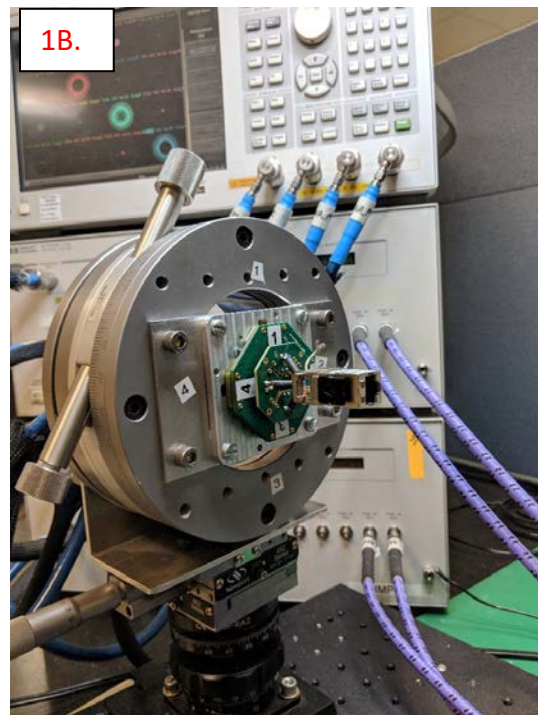
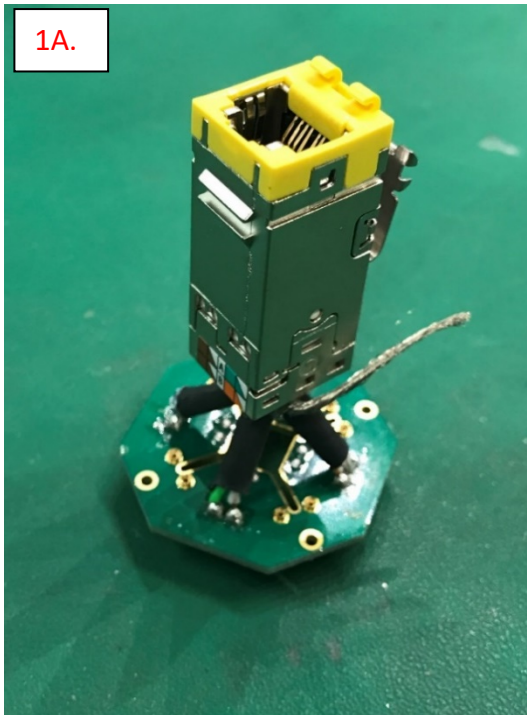
In Greensboro, we develop and manufacture a broad range of modular, copper RJ45 jacks for data and voice transmissions. In the validation and qualification development stages, within the jack life cycle, a quantity of thirty jacks are measured to determine if the jacks are compliant to industry standard transmission requirements. Thirty jack samples represent one sample group. A key component used in the jack to help achieve transmission performance is a printed circuit board (PCB). Multiple PCB iterations are chosen to determine which iteration provides the best transmission performance. With multiple PCB iterations (sample groups), a large volume of jacks need to be prepared to enable them to interface with a network analyzer for transmission testing. Measuring thirty samples per sample group provides statistical confidence in the measured data. This data is then analyzed by our development engineers to determine next steps.

Presently, jack preparation prior to testing is a large time investment within our laboratory as preparation is a tedious and arduous process. This time impediment delays decision making as PCB iterations need to be selected within a timely manner to ensure project date commitments are met to release product offerings to our customers.

Jack preparation for a 30 sample run currently takes one individual 12 hours. The current process is entirely manual. Besides being costly, this time duration delays responsiveness to customers. The objective of the senior design project is to examine and analyze this process and develop an automated solution that will reduce jack preparation time by 75%. For reference, see the example

of a RJ-45 jack mounted to the test PCB in Figure 1A. That assembly is shown connected to the Network Analyzer shown in Figure 1B.

Figure-1: Final Image of Jack Mounted onto PCB and Network Analyzer Interface



Project Requirements:

Design, develop and/or specify any necessary fixtures, tools, automation, components or process steps needed to support an improved process. Changes impacting the network analyzer interface are not allowed, unless presented and approved early in the first semester. Any new fixture or process development should be adequately documented so technicians can easily be trained to reliably execute the process. Demonstrate and verify a new process that yields a 75% reduction in sample preparation time.

Expected Deliverables/Results:

- Design work created in support of this project (models and drawings)
- Bill of material (BOM) for any associated new fixtures
- Complete material listing, source and cost of any specified “off the shelf” components
- Any new fixtures created in support of this improvement project
- Standard work instructions on revised process

Disposition of Deliverables at the End of the Project:



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Project hardware and associated documentation to be delivered to the CommScope test lab in Greensboro, NC.

List here any specific skills, requirements, knowledge needed or suggested (If none please state none):

- Mechanical design skills
- Basic lab skills/knowledge
- Ability to solder components