



Model Curriculum

QP Name: Surface Mount Technology (SMT)- Telecom Technician

QP Code: TEL/Q2501

Version: 5.0

NSQF Level: 4.0

Model Curriculum Version: 5.0

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Training Parameters

Sector	Telecom
Sub-Sector	Handset
Occupation	Communication Electronics
Country	India
NSQF Level	4.0
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3114.1402
Minimum Educational Qualification and Experience	12th grade pass OR Completed 2nd year of the 3-year diploma after 10th in Electronics and Communication Engineering/ Electrical and Electronics Engineering/ Instrumentation and Control Engineering OR 10th-grade pass with 3 years of experience in handset assembly OR Previous relevant Qualification of NSQF Level 3.0 with 3 years of experience in handset assembly OR Previous relevant Qualification of NSQF Level 3.5 with 1.5 years of experience in handset assembly
Pre-Requisite License or Training	NA
Minimum Job Entry Age	NA
Last Reviewed On	08-05-2025
Next Review Date	30-04-2028
NSQC Approval Date	08-05-2025
QP Version	5.0
Model Curriculum Creation Date	13-03-2025
Model Curriculum Valid Up to Date	30-04-2028
Model Curriculum Version	5.0
Minimum Duration of the Course	540 Hours
Maximum Duration of the Course	540 Hours

Program Overview

This section summarises the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills to:

- Explain the process of screen printing on PCBs and its significance in circuit assembly.
- Describe the key considerations for accurate component placement on PCBs.
- Discuss the role of re-flow soldering in PCB manufacturing and its impact on circuit reliability.
- Elucidate the importance of cleaning and inspection in ensuring the quality of PCBs.
- Determine the key sustainability practices that must be followed in telecom production and assembly line processes.
- Discuss the Employability and Entrepreneurship Skills.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration (Hours)	Practical Duration (Hours)	On-the-Job Training Duration (Mandatory) (Hours)	On-the-Job Training Duration (Recommended) (Hours)	Total Duration (Hours)
TEL/N2503: Screen Printing of PCBs NOS Version No.: 4.0 NSQF Level: 4.0	60:00	60:00	30:00	00:00	150:00
Module 1: Introduction to the sector and the job role of a Telecom Surface Mount Technology (SMT) Technician	05:00	00:00	00:00	00:00	05:00
Module 2: Screen Printing and Quality Assurance of PCBs	55:00	60:00	30:00	00:00	145:00
TEL/N2504: Component Placement on PCBs NOS Version No.: 4.0 NSQF Level: 4.0	30:00	60:00	60:00	00:00	150:00
Module 3: Precision Component Placement on PCBs	30:00	60:00	60:00	00:00	150:00
TEL/N2505: Re-flow soldering on PCBs NOS Version No.: 4.0 NSQF Level: 4.0	30:00	30:00	30:00	00:00	90:00

Module 4: Re-flow Soldering Process and Quality Assurance for PCBs	30:00	30:00	30:00	00:00	90:00
TEL/N2502: Cleaning and Inspection of PCBs NOS Version No.: 5.0 NSQF Level: 4.0	20:00	40:00	30:00	00:00	90:00
Module 5: Cleaning and Quality Inspection of PCBs	20:00	40:00	30:00	00:00	90:00
TEL/N9107: Follow sustainability practices in telecom production and assembly line processes NOS Version No.: 1.0 NSQF Level: 4.0	10:00	20:00	00:00	00:00	30:00
Module 6: Sustainable Practices in Telecom Production and Assembly	10:00	20:00	00:00	00:00	30:00
DGT/VSQ/N0101: Employability Skills (30 Hours) NOS Version No.: 1.0 NSQF Level: 2	30:00	00:00	00:00	00:00	30:00
Module 7: Employability Skills (30 Hours)	30:00	00:00	00:00	00:00	30:00
Total Duration	180:00	210:00	150:00	00:00	540:00

Module Details

Module 1: Introduction to the sector and the job role of a Surface Mount Technology (Telecom Technician)

Mapped to TEL/N2503, v4.0

Terminal Outcomes:

- Explain the importance of Telecom Sector.
- Discuss the roles and responsibilities of a Surface Mount Technology (Telecom Technician) Technician.

Duration (in hours): 05:00	Duration (in hours): 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Explain the significance of the telecom sector in the manufacturing and assembly of Surface Mount Technology (SMT) components. • Elucidate the key skills and technical expertise required for a Telecom SMT Technician. • Describe the challenges faced in assembling and testing telecom circuit boards using SMT processes. • Determine the impact of precision and quality control in Surface Mount Technology (SMT) assembly for telecom products. • Discuss the roles and responsibilities of a Telecom SMT Technician in ensuring efficient and high-quality production.	
Classroom Aids	
Training Kit - Facilitator's Guide, Participant's Handbook, Presentations and Software, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Nil	

Module 2: Screen Printing and Quality Assurance of PCBs

Mapped to TEL/N2503, v4.0

Terminal Outcomes:

- Explain the preparation and baking process of PCBs before screen printing.
- Describe the screen-printing process used for PCBs.
- Discuss the importance of quality checks and process optimization in screen printing of PCBs.

Duration (in hours): 55:00	Duration (in hours): 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Explain the industry standards and best practices for telecom PCB screen printing. • Discuss the impact of moisture on PCBs and the necessity of baking for reliable solder paste adhesion. • Describe the properties of different solder pastes and their suitability for various applications. • Elucidate the importance of stencil cleaning and maintenance to prevent defects and ensure repeatability. • Determine the effects of temperature, humidity, and process parameters on screen printing quality. • Explain the principles of stencil alignment, fiducial mark recognition, and support pin positioning. • Discuss the operation, calibration, and maintenance of screen printing machines for optimal performance. • Describe the quality control techniques, including paste thickness measurement and visual inspection criteria. • Elucidate the safe handling and disposal of chemicals, solvents, and consumables as per regulatory standards. • Determine the documentation and reporting requirements for process tracking and quality assurance.	• Demonstrate how to determine baking requirements based on customer specifications, material type, and process standards. • Show how to stack and place boards in the oven rack following specified alignment and spacing guidelines. • Demonstrate how to set and monitor temperature, timer, and humidity conditions in the oven as per process requirements. • Show how to inspect boards post-baking to check for moisture removal and surface readiness. • Demonstrate how to select appropriate tools and accessories, including stencil matching the PCB pattern, correct squeegee size, and specified solder paste formulation. • Show how to clean the stencil before and after use with approved solvents and specified processes to prevent contamination. • Demonstrate how to apply solder paste evenly using controlled deposition techniques to achieve uniform thickness. • Show how to thaw solder paste to the recommended temperature and maintain viscosity consistency before application. • Demonstrate how to align the stencil, PCB, and squeegee in the screen printer for accurate registration and positioning. • Show how to operate the screen-printing machine, adjusting pressure, speed, and alignment settings for optimal performance.

	• Demonstrate how to measure and verify solder paste thickness post-printing, ensuring conformance to process specifications. • Show how to troubleshoot printing defects such as misalignment, insufficient paste deposition, or excessive bridging, making necessary adjustments. • Demonstrate how to conduct visual and automated inspection to detect defects such as smudging, misalignment, or improper paste application. • Show how to document and report deviations, corrective actions, and process improvements as per standard operating procedures. • Demonstrate how to ensure proper storage and handling of consumables, including solder paste and stencils, to maintain process consistency. • Show how to adhere to safety, health, and environmental guidelines while handling chemicals and operating equipment.
Classroom Aids	
Training Kit - Facilitator's Guide, Participant's Handbook, Presentations and Software, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Stencil Sets & Racks, Stencil Cleaning Machine, Solder Mask (PPE), Specification Charts, Laser Alignment & Vision System, IPC / IEC / CE Standard Documents, Internal Quality Control (IQC) / QMS / TQM, Preventive Do's & Don'ts Placards, 5S Items, Charts, Checklists	

Module 3: Precision Component Placement on PCBs

Mapped to TEL/N2504, v4.0

Terminal Outcomes:

- Explain the process of feeding and verifying placement data for PCB assembly.
- Describe the procedure for loading chip component rolls in the placement system.
- Elucidate the steps involved in loading chip component trays for PCB assembly.
- Discuss the operation of chip shooter and fine pitch placer equipment in component placement.

Duration (in hours): 30:00	Duration (in hours): 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Explain the key work and project management concepts relevant to component placement. • Describe the importance of following standard procedures for drawing components and the potential impact of non-compliance. • Elucidate the escalation matrix for reporting non-compliance issues. • Discuss the required process and work records for documentation in component placement. • Explain the Safety, Health, and Environment (SHE) and Occupational Health and Safety (OHS) regulations as per industry standards. • Determine the significance of system specifications, part numbers, and the Bill of Material (BOM) in component placement. • Describe the operational parameters and maintenance requirements of component placement machines. • Explain how to interpret Gerber and x-y coordinate data for precise positioning of components. • Discuss the operational cycle and troubleshooting techniques of component placement equipment. • Describe the techniques for verifying components under a microscope to ensure correct placement and connectivity.	• Demonstrate how to map board specifications to the correct software version and input/verify component placement program data in the equipment. • Show how to interpret Gerber and x-y coordinate data for precise component placement. • Demonstrate how to navigate and operate the machine software interface effectively. • Show how to check and confirm the operation of the roll feeder mechanism and inspect feeder functions for error-free operation. • Demonstrate how to feed Gerber data, insert feeder rolls, and verify component rolls against part numbers and work specifications. • Show how to load chip component rolls and trays accurately in the feeder, ensuring correct orientation. • Demonstrate how to input x-y coordinate data for precise positioning of components. • Show how to check and calibrate the vision cameras for accurate placement. • Demonstrate how to verify the correct loading of PCBs, component placement program, and component rolls or trays. • Show how to check placement vacuum pressure to ensure proper suction.

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| <ul style="list-style-type: none"> • Explain electrostatic discharge (ESD) precautions, handling procedures, and workplace hygiene. • Elucidate different types of SMT defects, including misalignment, solder bridges, and component shifting. • Discuss best practices for quality assurance and functional testing of PCBs. | <ul style="list-style-type: none"> • Demonstrate how to operate the component placement equipment according to defined procedures. • Show how to apply the tape board technique to validate placement accuracy. • Demonstrate how to inspect the first sample PCB under a microscope to verify component correctness and placement. • Show how to identify and rectify common SMT defects such as tombstoning and solder shorts. • Demonstrate how to document and report any deviations or errors in placement accuracy. |
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Classroom Aids

Training Kit - Facilitator's Guide, Participant's Handbook, Presentations and Software, Whiteboard, Marker, Projector, Laptop, Video Films

Tools, Equipment and Other Requirements

Fine Pitch, BGA, & Micro BGA Placement, SMT V-CUT PCB Separator / Cutting Machine, Lead Trimming System, Lead-Free Solder Paste (With / Without Flux), RF Measurement System / Station, Embedded Computers, Digital Soldering Station, Bar Code Scanner, Components Tray/Bins/Strips Bobbin, Conveyor Lines Drive Assembly

Module 4: Re-flow Soldering Process and Quality Assurance for PCBs

Mapped to TEL/N2505, v4.0

Terminal Outcomes:

- Describe the preparation steps required for setting up the reflow soldering machine.
- Discuss the reflow soldering operation on PCBs and the importance of QA checks.

Duration (in hours): 30:00	Duration (in hours): 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Explain the principles of surface mount technology (SMT) and its significance in telecom PCB manufacturing. • Describe SMT electronic components and their temperature capabilities. • Discuss the relationship between PCBs, solder paste, and SMT processes. • Elucidate the specifications and functions of different solder pastes, including lead-free and leaded options. • Explain the importance of work instructions, standard operating procedures, and industry best practices for re-flow soldering. • Determine the factors affecting solderability, including oxidation, contamination, humidity, and material compatibility. • Describe the types of defects in re-flow soldering, their causes, and corrective measures. • Explain thermal profiling techniques and the impact of incorrect temperature settings on PCB performance. • Discuss the importance of belt speed, heat zones, and cooling rates in achieving proper solder reflow. • Elucidate the industry standards and compliance requirements such as IPC-A-610 for electronic assemblies. • Describe occupational health and safety (OHS) practices, including safe handling of chemicals, fire prevention measures, and emergency response protocols.	• Demonstrate how to interpret solder paste characteristics, including viscosity, flux content, and recommended re-flow temperature profile from datasheets and machine guidelines. • Show how to set and load the required parameters in the re-flow machine, including temperature zones, conveyor speed, and cooling profile. • Demonstrate how to verify the functionality of thermal profiling equipment and perform a sample PCB run to measure real-time thermal response. • Show how to analyze thermal profiling data and make necessary adjustments to achieve optimal soldering results. • Demonstrate how to ensure the machine is calibrated and functional before commencing full-scale operations. • Show how to ensure proper placement of components and even application of solder paste before passing the PCB through the re-flow machine. • Demonstrate how to monitor the re-flow process and check for deviations in temperature, conveyor movement, and gas flow inside the chamber. • Show how to safely retrieve the PCB post re-flow cycle and allow it to cool under controlled conditions. • Demonstrate how to inspect the PCB for defects such as dry solder joints, tombstoning, misalignment, delamination, and thermal stress-induced damage. • Show how to conduct additional QA tests such as X-ray analysis, optical inspection, or

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| <ul style="list-style-type: none"> Explain the record-keeping and documentation requirements for traceability and process optimization. | <ul style="list-style-type: none"> functional testing to confirm solder joint integrity. Demonstrate how to record process parameters and defect data for continuous improvement and traceability. |
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Classroom Aids

Training Kit - Facilitator's Guide, Participant's Handbook, Presentations and Software, Whiteboard, Marker, Projector, Laptop, Video Films

Tools, Equipment and Other Requirements

Reflow Soldering Machine, Wave Soldering Machines, Soldering Tip Polisher, Digital CRO, OS & APP Flashing Station, High Layer Count PCB Assembler/Tester, Internal Quality Control (IQC) / QMS / TQM, EMI / ROHS / WEEE Standard Documents, ESD Safe Smoke Absorbers, Battery Charging System

Module 5: Cleaning and Quality Inspection of PCBs

Mapped to TEL/N2502, v5.0

Terminal Outcomes:

- Explain the process and importance of cleaning PCBs after assembly.
- Describe the key quality checks and assurance measures for PCBs.

Duration (in hours): 20:00	Duration (in hours): 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Explain the principles of work/project management and their application in PCB inspection. • Discuss the risks and consequences of non-compliance with defined procedures. • Describe the escalation matrix for reporting incidents such as system failures, contamination issues, and non-conformities. • Elucidate the importance of record-keeping and the potential consequences of poor documentation. • Explain the Safety, Health, and Environment (SHE) and Occupational Health and Safety (OHS) regulations as per company and industry standards. • Describe the properties, usage, and handling of cleaning chemicals/solvents used for PCB cleaning. • Discuss the principles and techniques of PCB cleaning, including solvent-based and ultrasonic methods. • Explain the operation and maintenance of cleaning equipment such as vapor de-greasers and ultrasonic cleaners. • Determine the key quality control and quality assurance parameters related to PCB inspection. • Discuss IPC and industry standards for soldering, component placement, and PCB integrity. • Describe ESD-safe handling procedures and their impact on PCB reliability.	• Demonstrate how to clean PCBs to remove flux residues, white patches, and other contaminants using specified solvents and cleaning agents. • Show how to operate a vapor de-greaser, ultrasonic cleaner, and other industry-recommended equipment for effective PCB cleaning. • Demonstrate controlled drying methods to prevent damage and contamination of PCBs. • Show how to package and store cleaned PCBs using electrostatic discharge (ESD)-safe materials and procedures. • Demonstrate how to check PCBs for missing, wrongly mounted, or misaligned components as per specifications and the bill of materials (BOM). • Show how to inspect soldering quality, including workmanship, joint integrity, and adherence to IPC standards. • Demonstrate the verification process for PCB identifiers, conformal coatings, and compliance with customer or regulatory requirements. • Show how to identify defects such as cold solder joints, bridging, and insufficient solder, and take corrective action. • Demonstrate how to identify and segregate functional and defective PCBs. • Show how to document findings and escalate non-conformities as per established reporting protocols. • Demonstrate routine maintenance of SMT equipment to ensure optimal functioning.

	• Show how to conduct routine shop floor audits to ensure adherence to process parameters, including temperature and humidity control.
Classroom Aids	
Training Kit - Facilitator's Guide, Participant's Handbook, Presentations and Software, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
PCB Cleaning Solution (IPA), PCB Cleaning Machine, Static Level Meter, Humid/Moist Control Desiccant Dry Box (Adjustable / Auto), High Density Press Fit Connector Assembler/Tester, In-Circuit Testing Machine, Master Design File, Micro Clean Room, Document Pads/Files, Assembly Line Protector	

Module 6: Sustainable Practices in Telecom Production and Assembly

Mapped to TEL/N9107, v1.0

Terminal Outcomes:

- Explain the process of identifying and segregating recyclable, refurbishable, and hazardous telecom components.
- Discuss the importance of following green manufacturing and sustainable assembly practices in telecom production.
- Describe the correct procedures for disposing of and recycling waste in telecom assembly lines.
- Determine the key environmental and sustainability regulations that must be complied with in telecom manufacturing.

Duration (in hours): 10:00	Duration (in hours): 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Explain the organization's sustainability policies and goals. • Elucidate the key aspects of EPR guidelines, ISO 14001, and e-waste disposal laws. • Discuss the methods for identifying recyclable and hazardous components in telecom production. • Describe green manufacturing practices, including energy-efficient tools, lead-free soldering, and automation. • Explain the proper handling, storage, and disposal methods for e-waste. • Determine techniques for reducing material wastage without impacting production quality. • Discuss the safe and responsible handling of hazardous and non-hazardous materials in telecom manufacturing. • Describe environmental impact assessment techniques for telecom production. • Explain the documentation requirements for sustainability audits and compliance tracking.	• Demonstrate how to inspect, categorize, and store telecom components such as PCBs, cables, batteries, and plastic casings for appropriate processing, ensuring compliance with EPR guidelines. • Show how to maintain an inventory of recyclable and hazardous materials while tracking waste management and reporting improper disposal practices. • Demonstrate the use of energy-efficient equipment, tools, and automated systems to reduce carbon footprint and optimize material, water, and electricity consumption. • Show how to follow low-emission soldering and lead-free assembly processes while ensuring compliance with ISO 14001 (Environmental Management System). • Demonstrate the process of maintaining and calibrating energy-efficient machinery to ensure optimal performance and minimize environmental impact. • Show how to properly dispose of hazardous waste (e.g., lithium batteries, chemical residues) and deposit non-hazardous recyclable materials (e.g., plastics, aluminum, copper) in designated collection areas. • Demonstrate how to maintain documentation for waste disposal, conduct

	periodic waste audits, and identify opportunities for further waste reduction. • Show how to coordinate with authorized e-waste recyclers to ensure proper processing and disposal of materials. • Demonstrate how to follow national and international environmental laws, participate in sustainability audits, check for adherence to guidelines, and implement corrective actions based on assessments.
Classroom Aids	
Training Kit - Facilitator's Guide, Participant's Handbook, Presentations and Software, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Lead-Free Solder Paste (with/without Flux), EMI/ROHS/WEEE Standard Documents, Internal Quality Control (IQC)/QMS/TQM Covering All Stages, Adhesives and Cleaning Products, 5S Items, Charts, Checklists, PCB Cleaning Solution (IPA), Stencil Sets & Racks, Conveyor Pallet, Specification Charts (for critical components like ICs, Microphone, Ear Piece, Connectors).	

Module 7: Employability Skills (30 Hours)

Mapped to DGT/VSQ/N0101, v1.0

Duration: 30:00 Hours

Key Learning Outcomes

Introduction to Employability Skills Duration: 1 Hour

After completing this programme, participants will be able to:

1. Discuss the importance of Employability Skills in meeting the job requirements

Constitutional values - Citizenship Duration: 1 Hour

2. Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.
3. Show how to practice different environmentally sustainable practices

Becoming a Professional in the 21st Century Duration: 1 Hour

4. Discuss 21st-century skills.
5. Display a positive attitude, self-motivation, problem-solving, time management skills and continuous learning mindset in different situations.

Basic English Skills Duration: 2 Hours

6. Use appropriate basic English sentences/phrases while speaking

Communication Skills Duration: 4 Hours

7. Demonstrate how to communicate in a well-mannered way with others.
8. Demonstrate working with others in a team

Diversity & Inclusion Duration: 1 Hour

9. Show how to conduct oneself appropriately with all genders and PwD
10. Discuss the significance of reporting sexual harassment issues in time

Financial and Legal Literacy Duration: 4 Hours

11. Discuss the significance of using financial products and services safely and securely.
12. Explain the importance of managing expenses, income, and savings.
13. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws

Essential Digital Skills Duration: 3 Hours

14. Show how to operate digital devices and use the associated applications and features, safely and securely
15. Discuss the significance of using the internet for browsing, and accessing social media platforms, safely and securely

Entrepreneurship Duration: 7 Hours

16. Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges

Customer Service Duration: 4 Hours

17. Differentiate between types of customers

18. Explain the significance of identifying customer needs and addressing them

19. Discuss the significance of maintaining hygiene and dressing appropriately

Getting ready for Apprenticeship & Jobs Duration: 2 Hours

20. Create a biodata

21. Use various sources to search and apply for jobs

22. Discuss the significance of dressing up neatly and maintaining hygiene for an interview

23. Discuss how to search and register for apprenticeship opportunities

Module 8: On-the-Job Training

Mapped to Surface Mount Technology (Telecom Technician)

Mandatory Duration(in hours): 150:00	Recommended Duration(in hours): 00:00
Location: On-Site	
Terminal Outcomes • Demonstrate the preparation and baking process of boards before screen printing. • Show how to perform the screen-printing process used for PCBs. • Demonstrate the importance of quality checks and process optimization in screen printing of PCBs. • Show how to feed and verify placement data for PCB assembly. • Demonstrate the procedure for loading chip component rolls in the placement system. • Show how to load chip component trays for PCB assembly. • Demonstrate the operation of chip shooter and fine pitch placer equipment in component placement. • Show how to prepare and set up the reflow soldering machine. • Demonstrate the reflow soldering operation on PCBs and conduct QA checks. • Show how to clean PCBs after assembly and explain its importance. • Demonstrate key quality checks and assurance measures for PCBs. • Show how to identify and segregate recyclable, refurbishable, and hazardous telecom components. • Demonstrate the importance of following green manufacturing and sustainable assembly practices in telecom production. • Show how to correctly dispose of and recycle waste in telecom assembly lines. • Demonstrate compliance with key environmental and sustainability regulations in telecom manufacturing.	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialisation	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate	Electronics and Communication /Telecom/ Information Technology/ Computer Science and other relevant fields	6	Handset Assembling			

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Surface Mount Technology (Telecom Technician)” mapped to QP: “TEL/Q2501, v5.0”. Minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: “Trainer (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2601, v3.0”. The minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate	Electronics and Communication /Telecom/ Information Technology/ Computer Science and other relevant fields	6	Handset Assembling			

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Surface Mount Technology (Telecom Technician)” mapped to QP: “TEL/Q2501, v5.0”. Minimum accepted score is 80%.	Certified for the Job Role: “Assessor (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2701, v3.0”, with a minimum score of 80%.

Assessment Strategy

1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records

2. Testing Environment:

- Confirm that the centre is available at the same address as mentioned on SDMS or SIP
- Check the duration of the training.
- Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
- If the batch size is more than 30, then there should be 2 Assessors.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
- Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
- Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
- Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:

- Question papers created by the Subject Matter Experts (SME)
- Question papers created by the SME verified by the other subject Matter Experts
- Questions are mapped with NOS and PC
- Question papers are prepared considering that levels 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
- Assessor must be ToA certified & trainer must be ToT Certified
- Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Center photographs with signboards and scheme specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:

- Surprise visit to the assessment location
- Random audit of the batch
- Random audit of any candidate

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored

- Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
- Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

The trainee will be tested for the acquired skill, knowledge and attitude through formative/summative assessment at the end of the course and as this NOS and MC is adopted across sectors and qualifications, the respective AB can conduct the assessments as per their requirements.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective, or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do it upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
NCVET	National Council for Vocational Education and Training
QP	Qualification Pack
MC	Model Curriculum
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
NCO	National Classification of Occupations
ES	Employability Skills
TSSC	Telecom Sector Skill Council
TRAI	Telecom Regulatory Authority of India
PCB	Printed Circuit Board
RPA	Robotic Process Automation
ERP	Enterprise Resource Planning
AR	Augmented Reality
IoT	Internet of Things
SMT	Surface Mount Technology
ESD	Electrostatic Discharge
EPR	Extended Producer Responsibility