

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR TELECOM INDUSTRY

What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack- Telecom Technician - IoT Devices/Systems (Installation & M2M Communication Setup)

SECTOR: TELECOM

SUB-SECTOR: Network Management

OCCUPATION: OPERATION & MAINTENANCE

REFERENCE ID: TEL/Q6210

ALIGNED TO: NCO-2015/Nil

Brief Job Description: IoT installation and service technician is responsible for on-site installation and configuration of IoT devices (nodes), setup of communication links between nodes and controller (gateway) and further to central servers or devices through external communication links on Wi-Fi, 3G/4G networks on GSM/CDMA. The technician also undertakes first level of DI/DR.

Personal Attributes: Good analytical skills, adaptation to new technologies, attention to details, problem solving skills and fair communication skills are required for the role.

Job Details	Qualifications Pack Code	TEL/Q6210		
	Job Role	Telecom Technician - IoT Devices/Systems (Installation & M2M Communication Setup)		
	Credits(NSQF)	TBD	Version number	1.0
	Sector	Telecom	Drafted on	12/01/2017
	Sub-sector	Network Management	Last reviewed on	12/01/2017
	Occupation	Operation & Maintenance	Next review date	12/01/2019
	NSQC Clearance on	NA		

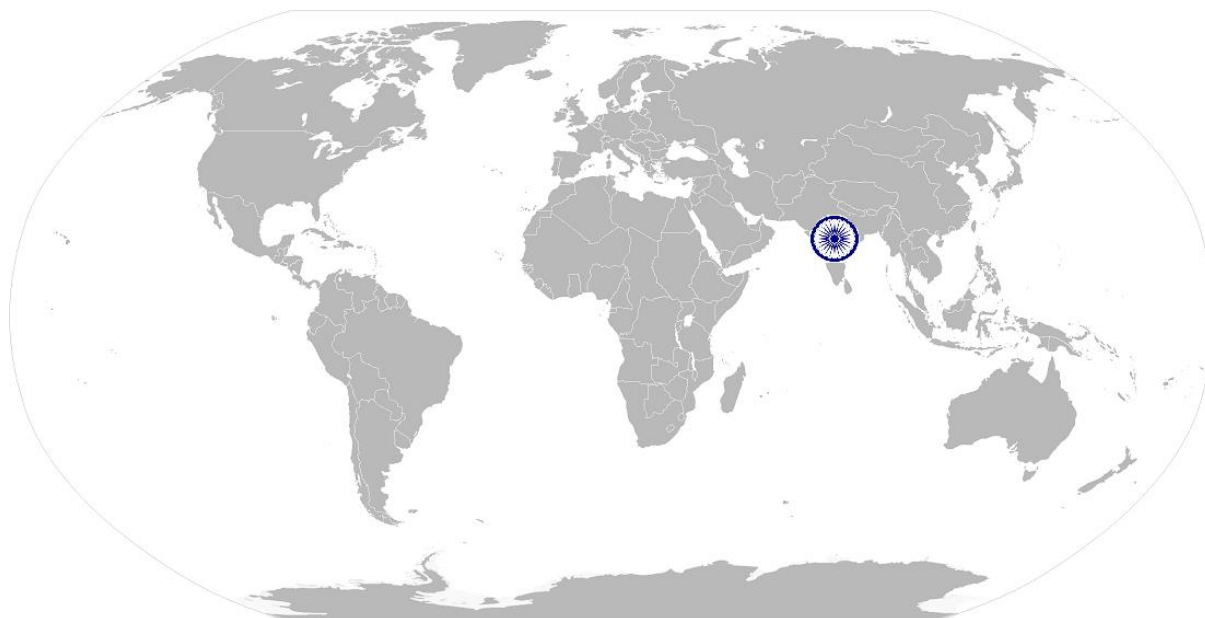
Job Role	Telecom Technician - IoT Devices/Systems (Installation & M2M Communication Setup)
Role Description	IoT installation and service technician is responsible for on-site installation of IoT devices, their configuration and establishing device communication as per the required protocol.
NSQF level	4
Minimum Educational Qualifications*	10 + 2 preferably
Maximum Educational Qualifications*	NA
Training (Suggested but not mandatory)	Practical knowledge on use of Web Services
Experience	NIL
Minimum entry Job Age	18 Years
Experience	NIL
Applicable National Occupational Standards (NOS)	Compulsory: TEL/N6234(Installation of IoT devices at customer premise/equipment) TEL/N6235 (Configuring IoT devices and establishing communication links) TEL/N6236(Undertake Level 1 Troubleshooting of IoT devices) TEL/N2509 (Health and Safety)
Performance Criteria	As described in the relevant OS units

Definitions

Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
OS	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
NOS	NOS are Occupational Standards which apply uniquely in the Indian context.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Qualifications Pack	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Unit Code	Unit Code is a unique identifier for an Occupational Standard, which is denoted by an 'N'.
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
Organizational Context	Organizational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills or Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.

Acronym	Keywords /Terms	Description
	IoT	Internet of Things
	DI	Defect Identification
	DR	Defect Rectification
	GSM	Global System of Mobile Communication
	CDMA	Code Division Multiple Access

National Occupational Standard



Overview

This unit is about installation of IoT devices (nodes and gateways) at customer premises/equipment.

TEL/N6234

Installation of IoT Devices at Customer Premises/equipment

National Occupational Standard

Unit Code	TEL/N6234
Unit Title (Task)	Installation of IoT devices at customer premises/equipment
Description	This unit is about installation of IoT nodes and gateway at customer premises/equipment
Scope	This unit/task covers the following: - Understanding of IoT devices (nodes and gateways) - Identification of suitable points/locations for installing IoT devices - Installation of IoT devices
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Understanding of IoT devices (nodes and gateways)	To be competent, the user/individual on the job must be able to PC1. understand basics of various type of micro-processor boards (Arduino, raspberry-Pi, customized platforms etc) and microcontrollers PC2. understanding functioning of various type of sensors (humidity, temperature, reed, pressure, gyrometer, accelerometer, video surveillance cameras etc) and actuators PC3. understand basics of short range communication protocols (blue tooth, Zigbee, WiFi, etc) and long range protocols including 3G/4G, 6LowPAN, LoRa etc and their applicability in IoT PC4. identify various components and PIN configurations on the micro-controller boards and interconnectivity provisions for input/output/power supply etc PC5. differentiate between node and a gateway
Identification of suitable points/locations for installing IoT devices	PC6. establish installation points to capture desired input parameters by the nodes/sensors PC7. establish installation point for gateway accounting for power supply requirements PC8. establish clear line of communication between nodes and gateway and between gateway and servers via 3G/4G or Wifi networks PC9. establish Ethernet connectivity, as required
Installation of IoT devices	PC10. prepare surface at location/point for mounting the device PC11. mounting of IoT devices at identified locations/points PC12. provide necessary connections to power supply, earthing, ensure proper grounding and no-floating earth situation understanding of SNR in case of wiring.
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. project management concepts and applications KA2. risk and impact of not following defined procedures/work instructions KA3. escalation matrix for reporting identified incidents, trouble sand/ or emergencies, e.g. system failures, fire and power failures KA4. SHE and OHS guidelines and regulations as per company's norms

TEL/N6234

Installation of IoT Devices at Customer Premises/equipment

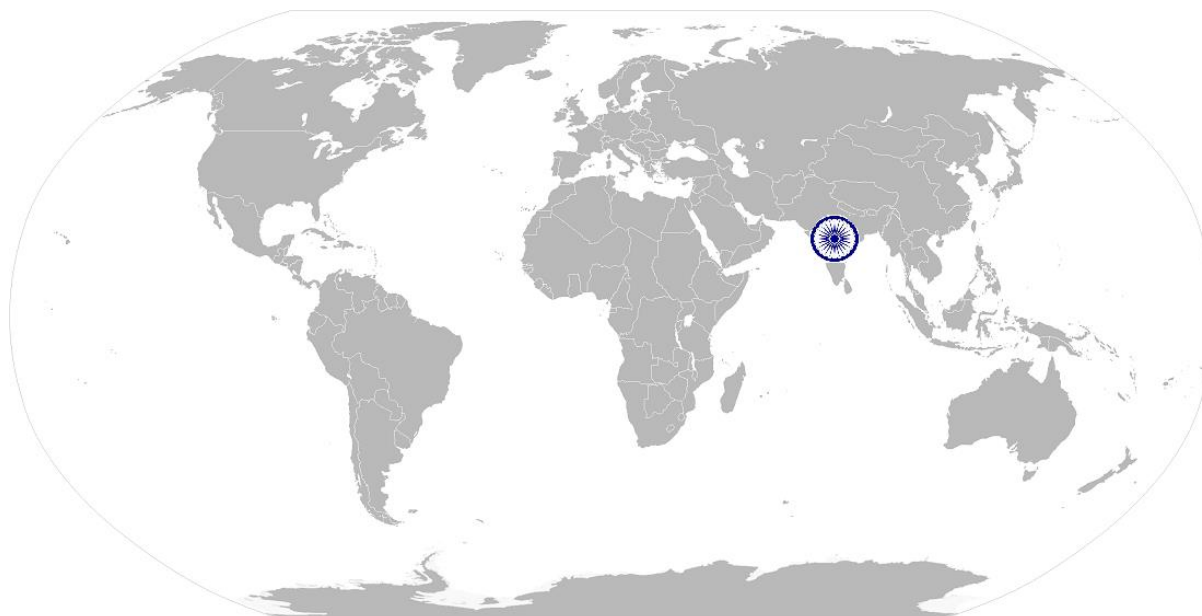
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. IoT basics, micro-processor and micro-controllers, configuration of eSIMs KB2. concept of node, gateway, communication protocols KB3. types of sensors and their operations, characteristics, limitations KB4. various grades of sensors and their reliability KB5. micro-processors boards, configurations, on-board devices and functionality KB6. basic interconnectivity diagram (electronic components, micro/bread-boards) KB7. crimping and connectorization for Ethernet cabling
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	The user/individual on the job needs to know and understand how to: SA1. write system concepts and flows SA2. maintain records and process document
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA3. read technical literature/parameters SA4. read and understand manuals, requirement documents, health and safety instructions, memos, reports etc.
	Oral Communication (Listening and speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. communicate with colleagues, peers and customers/stakeholders SA6. Liaisoning and coordination skills
B. Professional Skills	Decision making
	Not applicable
	Plan and Organize
	Not applicable
	Customer Centricity
	Not applicable
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB1. work-out suitable installation locations/points in a premise/equipment SB2. use of various tools and techniques for preparation of installation surface SB3. use of hand tools to carry out installation work SB4. read and understand device parameters and characteristics SB5. read, understand and configure on-board PIN configurations SB6. understand problem of device level communication and related requirements of Interconnectivity
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB7. safehandling of IoT devices SB8. check functioning of communication protocols
	Critical Thinking
	Not Applicable

TEL/N6234

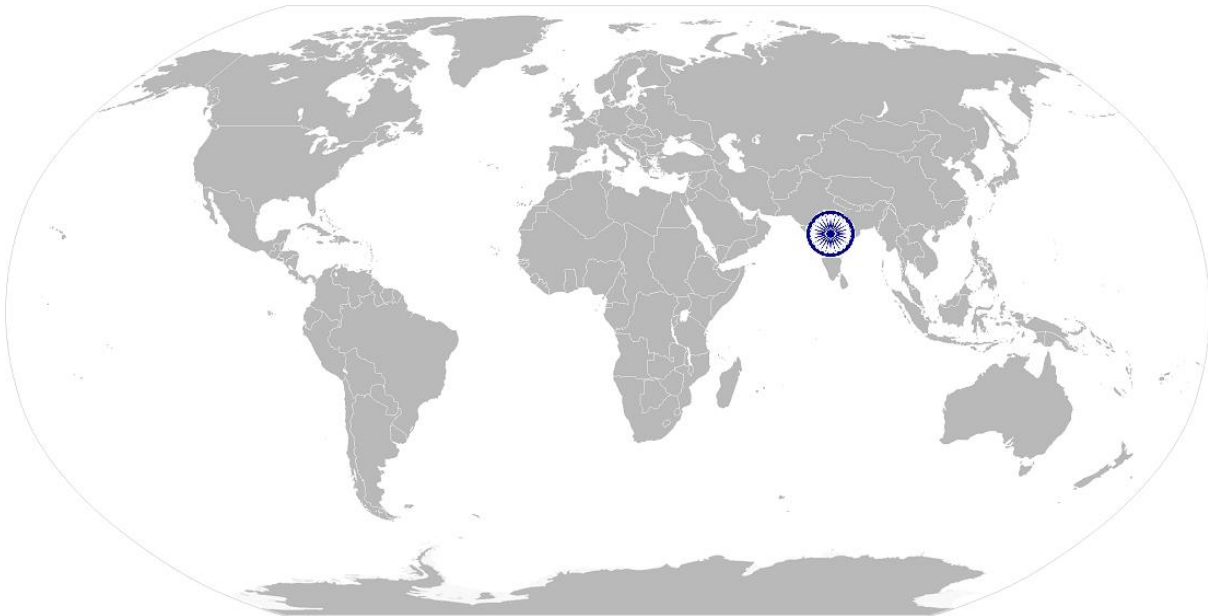
Installation of IoT Devices at Customer Premises/equipment

NOS Version Control

NOS Code	TEL/N6234		
Credits (NSQF)	TBD	Version number	1.0
Industry	Telecom	Drafted on	12/12/2016
Industry Sub-sector	Network Management	Last reviewed on	12/12/2016
Occupation	Operation & Maintenance	Next review date	12/12/2018



National Occupational Standard



Overview

This unit is about configuring IoT nodes and gateways for required functionality and establishing communication links between the devices and data transfer to backend servers at data centers/cloud.

TEL/N6235

Configuring IoT Devices and establishing Communication Links

National Occupational Standard

Unit Code	TEL/N6235
Unit Title (Task)	Configuring IoT devices and establishing communication links
Description	This unit is about configuring devices, uploading appropriate software to micro-controllers at nodes and gateways, defining communication protocols and establishing communication links for effecting data transfer between devices based on triggers from sensors
Scope	This unit/task covers the following: - connecting nodes & gateways (with hardware pre-configured) to data transfer devices (PC/Laptop) for software upload to micro-controllers - on-board compilation and debugging of software - establishing connectivity between nodes and gateway - establishing connectivity between gateway and backend servers
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Connecting nodes and gateways to data transfer devices for software upload to micro-controllers	To be competent, the user/individual on the job must be able to PC1. understand connectivity options available on micro controller boards for data transfer PC2. connect, using appropriate cable and connectors, micro controller to data transfer device (PC/Laptop) PC3. install suitable framework (on PC/Laptop), compatible with the micro-controller board PC4. transfer software code to on-board micro-processor on nodes and gateways
On-board compilation and debugging of software	PC5. compile code on-board micro processor using PC/laptop based framework PC6. understand error codes and debug software PC7. confirm proper functioning of micro-controller and attached devices using emulators/framework features
Establish connectivity between nodes and gateways	PC8. initialize the nodes and gateways for execution of the uploaded software PC9. launch the software on nodes and gateways PC10. confirm communication /data transfer using on-screen I/O streams or appropriate LED indications {as per the system test manual}
Establish connectivity between gateway and backend servers	PC11. establish connectivity between gateway and local wi-fi router or 3G/4G connectivity options (pre-configured in the uploaded software on gateway micro-controller), including configuration PC12. check for data transfer and confirm from the server end
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company /	The user/individual on the job needs to know and understand: KA1. project management concepts and applications KA2. risk and impact of not following defined procedures/workinstructions

TEL/N6235

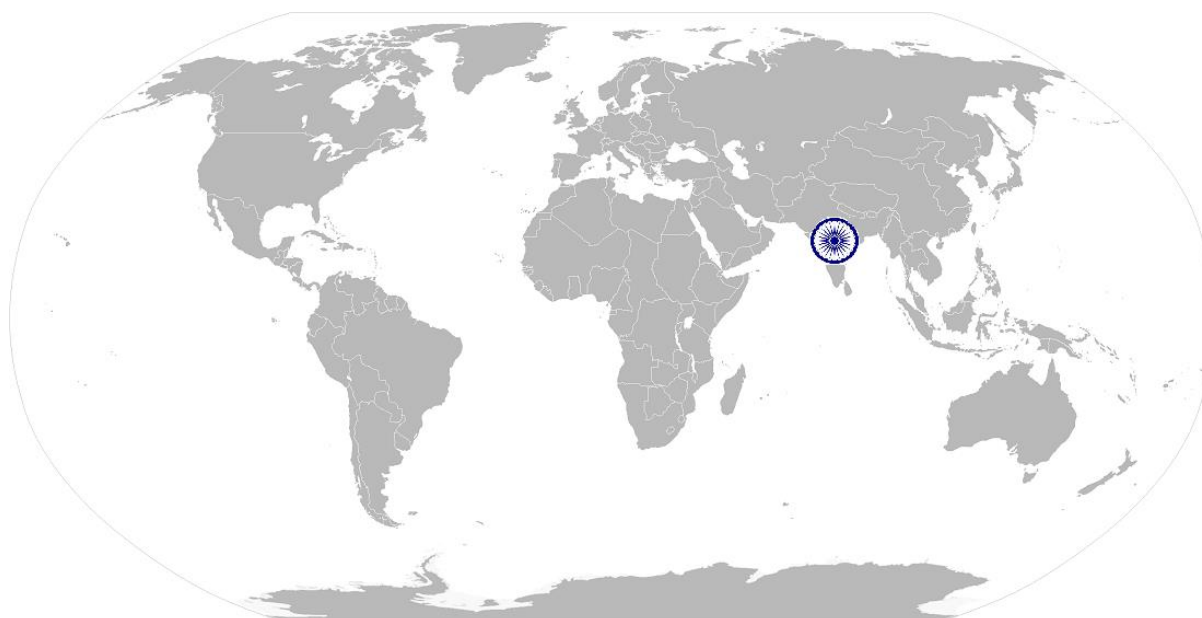
Configuring IoT Devices and establishing Communication Links

organization and its processes)	KA3. escalation matrix for reporting identified incidents, troubles and/or Emergencies, e.g. system failures, fire and power failures KA4. records to be maintained and implications of non-maintenance of the same KA5. SHE and OHS guidelines and regulations as per company's norms
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. web services and basics of programming using C++, Java KB2. short range communication protocols KB3. Wi-Fi, 3G, 4G communication protocols KB4. device connections, cables, connectors, proper grounding, frameworks and error reading & troubleshooting KB5. work familiarity with TCP/UDP protocols KB6. basics of network and communication security including best practices
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	The user/individual on the job needs to know and understand how to: SA1. fill up appropriate technical forms, activity log in required format of the company SA2. technical writing (flow, process steps etc)
	Reading Skills
	The user/individual on the job needs to know and understand how to SA3. reading of technical literature/requirements SA4. read and understand manuals, work orders, health and safety instructions, reports etc
	Oral Communication (Listening & Speaking Skills)
	The user/individual on the job needs to know and understand how to: SA5. communicating with colleagues, peers, management and stakeholders SA6. liaisoning and coordination skills
B. Professional Skills	Decision Making
	Not applicable
	Plan and Organize
	Not applicable
	Customer Centricity
	Not applicable
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB1. safe handle electronic devices (micro controller boards, IC's) SB2. use various tools, connectors and cables as per the device configuration SB3. install frameworks and establishing connectivity to connected devices SB4. undertake basic debugging of software code SB5. apply various short range communication protocols for effective communication
	Analytical Thinking
	Not applicable
	Critical Thinking
	Not applicable

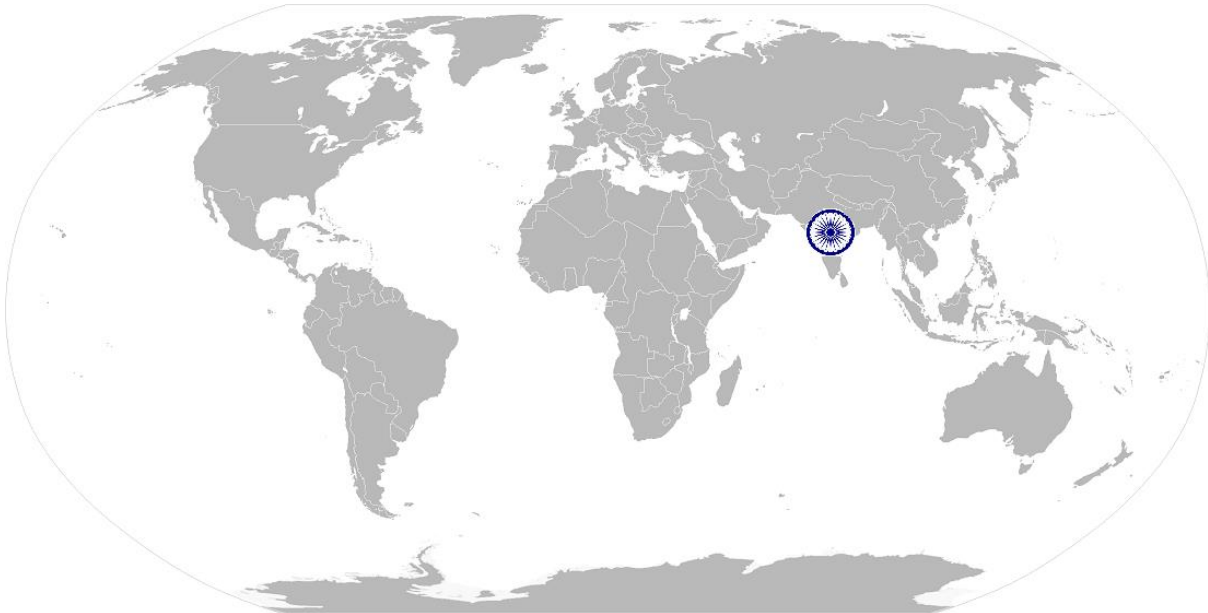
TEL/N6235 Configuring IoT Devices and establishing Communication Links

NOS Version Control

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Industry	Telecom	Drafted on	12/12/2016
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Occupation	Operation & Maintenance	Next review date	12/12/2018



National Occupational Standard



Overview

This unit is about undertaking first level of troubleshooting on IoT devices and device communication.

TEL/N6236

Undertake Level 1 Troubleshooting of IoT devices

National Occupational Standard

Unit Code	TEL/N6236
Unit Title (Task)	Undertake level 1 troubleshooting of IoT devices
Description	This unit is about undertaking first level of dtroubleshooting for IoT devices and device communication
Scope	This unit/task covers the following: • troubleshooting at IoT nodes • troubleshooting at IoT Gateways • troubleshooting of node-gateway (short range) and gateway-server (over Wi-Fi, 3g, 4G) communication
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Troubleshooting at IoT nodes	To be competent, the user/individual on the job must be able to PC1. test connectivity (PIN configurations) between sensors and micro-controller device using appropriate software tools/framework PC2. check on-board power supply PC3. re-load node software
Troubleshooting at IoT Gateway	PC4. test connectivity between nodes and gateway using appropriate software tools/framework PC5. check on-board power supply PC6. check all connectivity and PIN/jumper settings PC7. check on-board memory storage card for storing node data (using appropriate micro-controller board software/framework)
Troubleshooting of node-gateway (short range) and gateway-server (Wi-Fi/3G/4G) communication	PC8. check working of on-board Wi-Fi module, 3G, 4G connectivity module, as applicable, at the nodes PC9. check working of on-board Wi-Fi, 3G, 4G connectivity module, as applicable PC10. set appropriate connectivity ID's/password in the software code PC11. check communication link performance matrix between node and gateway using appropriate software tools/framework PC12. re-load node & gateway software, if required, and check communication again PC13. check data transfer from gateway to server PC14. escalate to the Main/Central Tech center
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. organizational processes and SPOCs relevant to work KA2. risk and impact of not following defined procedures/work instructions KA3. escalation matrix for de-bugging unresolved issues/incidences KA4. records to be maintained and implications of non-maintenance of the same KA5. SHE and OHS guidelines and regulations as per company's norms

TEL/N6236

Undertake Level 1 Troubleshooting of IoT devices

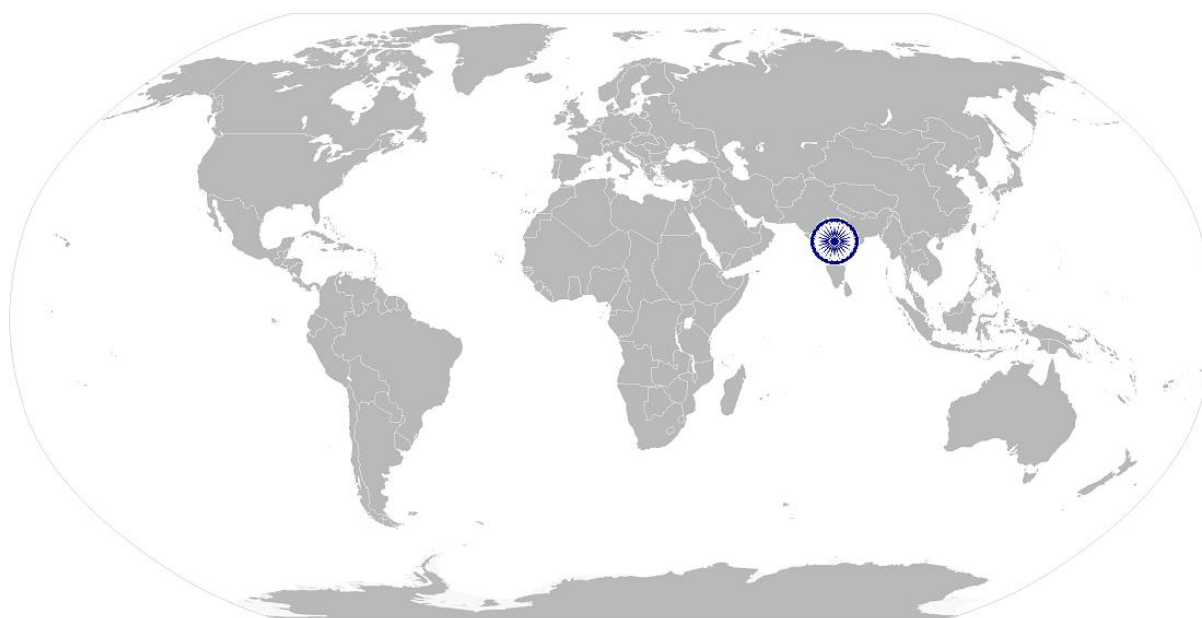
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. micro-controller boards, types and configurations KB2. communication protocols KB3. board specific software frameworks and their operations KB4. types of sensors and output types (digital/analog) KB5. reading and analyzing output for correctness and troubleshooting
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	The user/individual on the job needs to know and understand how to SA1. record performance/test results SA2. maintain proper records as per given format
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA3. read and understand technical documentation
	Oral Communication(Listening and Speaking Skills)
The user/individual on the job needs to know and understand how to: SA4. communicate with stakeholders SA5. liaison and coordination skills	
B. Professional Skills	Decision making
	Not applicable
	Plan and Organize
	Not applicable
	Customer Centricity
	Not applicable
	Problem Solving
	Not applicable
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB1. setup test environment SB2. formulate test strategy and test cases SB3. analyse results and debug SB4. setup test environment SB5. formulate test strategy and test cases SB6. analyse results and debug
	Critical Thinking
	Not Applicable

TEL/N6236

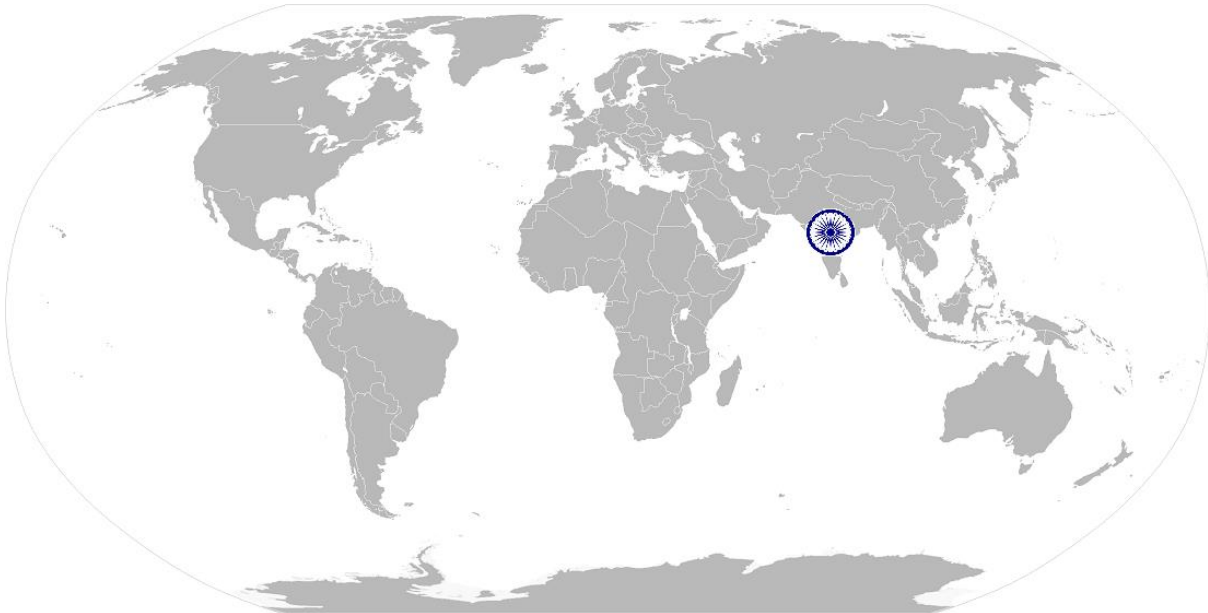
Undertake Level 1 Troubleshooting of IoT devices

NOS Version Control

NOS Code	TEL/N6236		
Credits (NSQF)	TBD	Version number	1.0
Industry	Telecom	Drafted on	12/12/2016
Industry Sub-sector	Network Management	Last reviewed on	12/12/2016
Occupation	Operation & Maintenance	Next review date	12/12/2018



National Occupational Standard



Overview

This unit is about monitoring the working environment and making sure it meets requirements for health, safety and security.

TEL/N2509

Health and Safety

National Occupational Standard

Unit Code	TEL/N2509
Unit Title(Task)	Health and Safety
Description	This unit is about monitoring the working environment and making sure it meets requirements for health, safety and security.
Scope	This unit/task covers the following: Health & Safety Compliance and Emergency procedures i.e. hazards, fire, accident and site emergency
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Health & Safety compliance and Emergency procedures	To be competent, the user/individual on the job must be able to PC1. ensure that work is carried out in accordance with the laid down safety, security policies and procedures of the organization PC2. ensure that site is assessed for safety and emergency readiness compliance as per company's guidelines PC3. ensure electrical safety compliances and EMI/EMC hygiene requirements are met as per the guidelines PC4. identify and correct any hazards that you can deal with safely, competently and within the limits of your authority PC5. report any hazards that you are not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected PC6. follow your organizations's emergency procedures promptly, calmly and efficiently PC7. identify and recommend opportunities for improving health, safety, security to the designated person PC8. complete any health and safety records legibly and accurately
Knowledge and Understanding (K)	
A.Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. legislative requirements and organizations procedures for health, safety and security and role and responsibilities in relation to this KA2. what is meant by hazard, including the different types of health and safety hazards that can be found in the workplace KA3. How and when to report hazards KA4. limits of yours responsibility for dealing with hazards KA5. your organization's emergency procedures for different emergency situations and the importance of following these KA6. the importance of maintaining high standards of health, safety and security KA7. Implications that any non – compliance with health, safety and security may have on individuals and the organization

TEL/N2509

Health and Safety

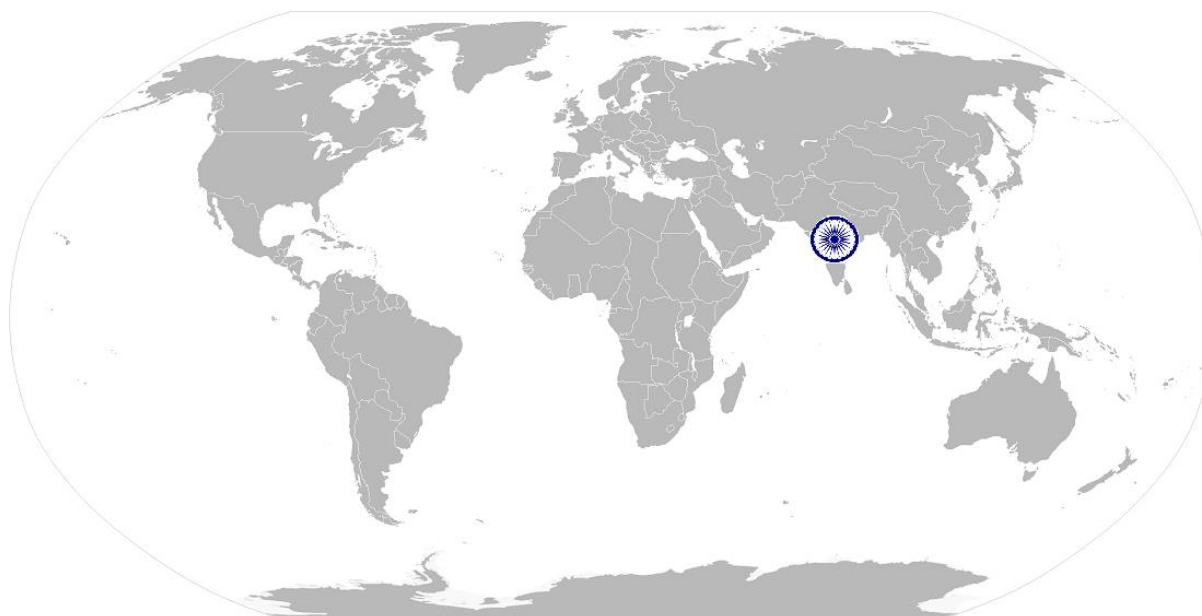
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of breaches in health, safety and security and how and when to report these KB2. evacuation procedures for works and visitors KB3. how to summon medical assistance and the emergency services, where necessary KB4. how to use the health, safety and accident reporting procedures and the importance of these KA5. government agencies in the area of safety, health and security and their norms and services
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills The user/individual on the job needs to know and understand how to: SA1. complete accurate well written work with attention to detail Reading Skills The user/individual on the job needs to know and understand how to: SA2. read instructions, guidelines, procedures rules and service level agreements Oral Communication (Listening and Speaking Skills) The user/individual on the job needs to know and understand how to: SA3. listen effectively and orally communicate information accurately
B. Professional Skills	Decision Making The user/individual on the job needs to know and understand how to: SB1. make decisions on suitable course location Plan and Organize The user/individual on the job needs to know and understand how to: SB2. plan and organize your work to meet health, safety and security requirements Customer Centricity Not Applicable Problem Solving The user/individual on the job needs to know and understand how to: SB3. apply problem solving approaches in different situations Analytical Thinking The user/individual on the job needs to know and understand how to: SB4. analyze data and activities Critical Thinking The user/individual on the job needs to know and understand how to: SB5. apply balanced judgments to different situations SB6. apply, analyze and evaluate the information gathered from observation, experience, reasoning or communication, as guide to thought and action

TEL/N2509

Health and Safety

NOS Version Control

NOS Code	TEL/N2509		
Credits (NSQF)	TBD	Version number	1.0
Industry	Telecom	Drafted on	12/09/2016
Industry Sub-sector	Network Management	Last reviewed on	12/09/2016
Occupation	Operation & Maintenance	Next review date	12/09/2018



TEL/Q6210 Telecom Technician - IoT Devices/Systems (Installation & M2M Communication Setup)

Criteria for Assessment of Trainee	
Job Role	: Telecom Technician - IoT Devices/Systems (Installation & M2M Communication Setup)
Qualification Pack	: TEL/Q6210
Sector Skill Council	: Telecom Sector Skill Council
1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC. 2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC. 3. Individual assessment agencies will create unique question papers for theory and skill practical part for each candidate at each examination/training center. 4. To pass the Qualification Pack, every trainee should score a minimum 70% in every NOS. 6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.	

Assessable Outcome	Assessment Criteria	Total Mark (400)	Out Of	Theory	Skills Practical
TEL/N6234 Understanding of IoT devices (nodes and gateways)	PC1. understand basics of various type of micro-processor boards (Arduino, Raspberry-Pi etc)	100	10	10	0
	PC2. understanding functioning of various type of sensors (humidity, temperature, reed, pressure etc)		10	5	5
	PC3. understand basics of short range communication protocols (blue tooth, Zigbeeetc) and 3G/4G protocols and their applicability in IoT		10	6	4
	PC4. identify various components and PIN configurations on the micro-controller boards and interconnectivity provisions for input/output/power supply etc		10	0	10
	PC5. differentiate between node and a gateway		10	5	5
Identification of suitable points/locations for installing IoT devices	PC6. establish installation points to capture desired input parameters by the nodes/sensors		10	4	6
	PC7. establish installation point for gateway accounting for power supply requirements		10	4	6
	PC8. establish clear line of communication between nodes and gateway and between gateway and servers via 3G/4G or Wifi networks		10	0	10
	PC9. establish Ethernet connectivity, as required				
Installation of IoT devices	PC10. prepare surface at location/point for mounting the device		10	4	6
	PC11. mounting of IoT devices at identified locations/points		10	4	6
	PC12. provide necessary connections to powersupply, earthing, ensure proper grounding and no-floating earth situation.				
Total			100	42	58
TEL/N6235 Connecting nodes and gateways to data transfer devices for software upload to micro-controllers	PC1. understand connectivity options available on micro controller boards for data transfer	100	10	4	6
	PC2. connect, using appropriate cable and connectors, micro controller to data transfer device (PC/Laptop)		8	0	8
	PC3. install suitable framework (on PC/Laptop), compatible with the micro-controller board		6	0	6
	PC4. transfer software code to on-board micro-processor on nodes and gateways		6	0	6
On-board compilation and de-bugging of software	PC5. compile code on-board micro processor using PC/laptop based framework		6	0	6
	PC6. understand error codes and debug software		8	4	4

TEL/Q6210 Telecom Technician - IoT Devices/Systems (Installation & M2M Communication Setup)

	PC7. confirm proper functioning of micro-controller and attached devices using emulators/framework features		8	0	8
Establish connectivity between nodes and gateways	PC8. initialize the nodes and gateways for execution of the uploaded software		8	0	8
	PC9. launch the software on nodes and gateways		10	4	6
	PC 10.confirm communication /data transfer using on-screen I/O streams or appropriate LED indications {as per the system test manual}		10	4	6
Establish connectivity between gateway and backend servers	PC11. Establish connectivity between gateway and local wi-fi router or 3G/4G connectivity options (pre-configured in the uploaded software on gateway micro-controller)		10	4	6
	PC12. Check for data transfer and confirm from the server end		10	0	10
Total			100	20	80
TEL/N6236 Troubleshooting at IoT nodes	PC1. test connectivity (PIN configurations) between sensors and micro-controller device using appropriate software tools/framework		8	2	6
	PC2. check on-board power supply		6	3	3
	PC3. re-load node software		6	0	6
Troubleshooting at IoT Gateway	PC4. test connectivity between nodes and gateway using appropriate software tools/framework		8	4	4
	PC5. check on-board power supply		6	0	6
	PC6. check all connectivity and PIN/jumper settings		10	4	6
Troubleshooting of node-gateway (short range) and gateway-server (Wi-Fi/3G/4G) communication	PC7. check on-board memory storage card for storing node data (using appropriate micro-controller board software/framework)	100	8	4	4
	PC8. check working of on-board Wi-Fi module, 3G, 4G connectivity module, as applicable, at the nodes		10	4	6
	PC9. check working of on-board Wi-Fi, 3G, 4G connectivity module, as applicable		10	4	6
	PC10. Set appropriate connectivity ID's/password in the software code		8	3	5
	PC11. check communication link performance matrix between node and gateway using appropriate software tools/framework		8	2	6
	PC12. re-load node & gateway software, if required, and check communication again		6	0	6
	PC13. check data transfer from gateway to server		6	0	6
Total			100	30	70
TEL/N2509 Health & Safety	PC1. ensure that work is carried out in accordance with the laid down safety, security policies and procedures of the organization		10	6	4
	PC2. ensure that site is assessed for safety and emergency readiness compliance as per company's guidelines		12	6	6
	PC3. ensure electrical safety compliances and EMI/EMC hygiene requirements are met as per the guidelines		15	9	6
	PC4. identify and correct any hazards that you can deal with safely, competently and within the limits of your authority		15	10	5
	PC5. report any hazards that you are not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected		12	7	5

TEL/Q6210 Telecom Technician - IoT Devices/Systems (Installation & M2M Communication Setup)

	PC6. follow your organizations's emergency procedures promptly, calmly and efficiently		12	6	6
	PC7. identify and recommend opportunities for improving health, safety, security to the designated person		14	8	6
	PC8. complete any health and safety records legibly and accurately		10	5	5
	Grand Total	400	100	57	43