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# SATELLITE DISH INSTALLER



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## LEARNER GUIDE

National Vocational Certificate Level 2

Version 1 - October, 2019



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Module-2  
LEARNER GUIDE  
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- This is the main content of your learner’s guide with detail of the knowledge and skills (practical activities, projects, assignments, practices etc.) you will require to achieve learning outcomes stated in the curriculum
- This section will include examples, photographs and illustrations relating to each learning outcome
- **Summary of modules:**
  - This contains the summary of the modules that make up your learner’s guide
- **Frequently asked questions:**
  - These have been added to provide further explanation and clarity on some of the difficult concepts and areas. This further helps you in preparing for your assessment.
- **Multiple choice questions for self-test:**
  - These are provided as an exercise at the end of your learner’s guide to help you in preparing for your assessment.

## Module 2: 0619001081 Develop Basic Electrical / Electronic Skills

**Objective of the module:** Objective of this module is to cover the skills and knowledge required to lay Electrical cables, perform single-phase AC Connection, Perform DC Connection, perform basic electric wiring and conduct wiring test.

**Duration**      **150** hours      **Theory:**      **30** hours      **Practical:**      **120** hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
<b>LU1: Lay Electrical cables</b>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Interpret electrical drawing/document</li> <li>2. Identify Electrical cables</li> <li>3. Lay Electrical cables</li> </ol> <p>Connect earthing.</p>	<ul style="list-style-type: none"> <li>• Interpret electrical drawing/documents. <ul style="list-style-type: none"> <li>○ Current path</li> <li>○ Layout drawing</li> <li>○ Wiring diagrams</li> </ul> </li> <li>• Identify electrical cables (AC and DC cables)</li> <li>• Lay electrical cables (Underground/trench, Overhead/Cancatenary)</li> <li>• Demonstrate earthing <ul style="list-style-type: none"> <li>○ Lighting arrester</li> <li>○ Equipment earth</li> <li>○ Electrical earth</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Measuring tape</li> <li>• Insulated plier, insulated wire cutter, insulated screw driver set, VOM, Cable knife, Cable cutter, Solder iron, blow lamp, Insulation tape.</li> </ul>

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
		<ul style="list-style-type: none"> <li>○ Electrostatic discharge</li> </ul> <p><b>Practice-1</b></p> <ul style="list-style-type: none"> <li>• Interpret current path.</li> <li>• Interpret layout drawings.</li> <li>• Interpret wiring diagram.</li> <li>• Apply wiring using current path.</li> <li>• Apply wiring layout diagrams.</li> <li>• Apply wiring as per dining room wiring.</li> <li>• Apply PVC wiring for Kitchen.</li> <li>• Apply open wiring for stare case.</li> </ul>	
<p><b>LU2: Perform single-phase AC Connection</b></p>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Select cable gauge</li> <li>2. Select cables colors</li> <li>3. Select tools and equipment</li> <li>4. Connect cables</li> </ol> <p>Insulate Joints</p>	<ul style="list-style-type: none"> <li>• Explain different types of cables</li> <li>• Demonstrate Selection of cables with respect to voltage and current</li> <li>• Demonstrate Classification of cables according to gauge.</li> <li>• Illustrate color coding of cables.</li> <li>• Demonstrate Classification of cable tools (hand tools/ knife, mechanical tools, wrenched knife) and equipment (VOM, MEGGER, earth tester)</li> <li>• Define cable joints</li> </ul>	<p>Learner guide Multi-media projector Handouts Videos</p> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>• Measuring tape</li> <li>• Insulated plier, insulated wire cutter, insulated screw driver set, VOM, Cable knife, Cable cutter, Solder iron, blow lamp, Insulation tape.</li> </ul>

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
		<ul style="list-style-type: none"> <li>• Explain how to Locate position for making joints.</li> <li>• Demonstrate different cable joints (straight joint, Britannia joint, cross joint)</li> <li>• Demonstrate LT (220 V ~ 380 V) voltage insulation on joints.</li> </ul> <p>Demonstrate HT (11 KV) voltage insulation on joints.</p>	<ul style="list-style-type: none"> <li>• AWG, SWG, Cable tables.</li> <li>• Multimeter/ VOM, Megger</li> </ul>
<p><b>LU3:</b> Perform DC Connection</p>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Select cable Gauge</li> <li>2. Select cables colors</li> <li>3. Connect cables</li> <li>4. Insulate Joints</li> </ol>	<ul style="list-style-type: none"> <li>• Explain different types cables</li> <li>• Demonstrate Selection of cables with respect to voltage and current</li> <li>• Demonstrate Classification of cables according to gauge.</li> <li>• Illustrate color coding of cables.</li> <li>• Demonstrate Classification of cable tools (hand tools/ knife, mechanical tools, wrenched knife) and equipment (VOM, Megger, earth tester)</li> <li>• Define cable joints</li> <li>• Explain how to Locate position for making joints.</li> <li>• Demonstrate different cable joints (straight joint, Britannia joint, cross joint)</li> <li>• Apply low voltage DC insulation on joints ( low frequency/ high frequency)</li> </ul>	<p>Learner guide Multi-media projector Handouts Videos</p> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>• Measuring tape</li> <li>• Insulated plier, insulated wire cutter, insulated screw driver set, Cable knife, Cable cutter, Solder iron, blow lamp, Insulation tape.</li> <li>• AWG, SWG, Cable tables.</li> <li>• Multimeter/VOM, Megger</li> </ul>

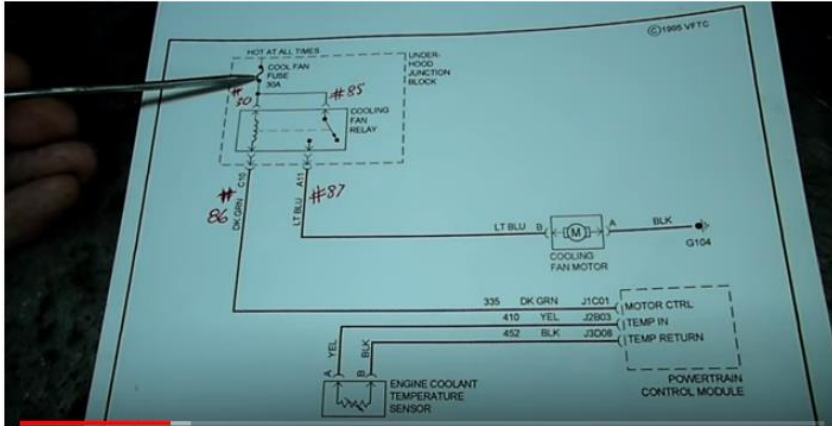
Learning Unit	Learning Outcomes	Learning Elements	Materials Required
		<p><b>Practice</b></p> <ul style="list-style-type: none"> <li>• Apply SWG, AWG etc.</li> <li>• Classify cable joints</li> <li>• Demonstrate color coding of cable.</li> <li>• Operate (VOM, MEGGER, earth tester)</li> <li>• Demonstrate to insulate joints.</li> <li>• Apply LT insulation tape on joint.</li> <li>• Apply HT tape on joint.</li> <li>• Apply Sleeve on simple solder joint.</li> </ul>	
<p><b>LU4:</b> Perform Basic Electrical wiring</p>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Measure cables as per requirement</li> <li>2. Connect cables</li> <li>3. Perform joints</li> <li>4. Insulate Joints</li> </ol>	<ul style="list-style-type: none"> <li>• Define basics of calibration and its importance.</li> <li>• Define calibration standards.</li> <li>• Demonstrate to record test results.</li> </ul> <p>Practical-1 Demonstrate calibration of required tools and equipment. i.e calibration of millimeter, satellite finder etc.</p>	<p>Learner guide Multi-media projector Handouts Videos</p> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>• Measuring tape</li> <li>• Insulated plier, insulated wire cutter, insulated screw driver set, VOM, Cable knife, Cable cutter, Solder iron, blow lamp, Insulation tape.</li> <li>• Measuring tape.</li> <li>• Wires of different size or gauges.</li> <li>• Insulation tape</li> </ul>
<p><b>LU5:</b> Conduct wiring Test</p>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Operate multi-meter for voltage and current</li> </ol>	<ul style="list-style-type: none"> <li>• Define Electrical tests</li> <li>• Demonstrate Categories of Electrical test</li> <li>• Demonstrate Selection of electrical</li> </ul>	<ul style="list-style-type: none"> <li>• Learner guide</li> <li>• Multi-media projector</li> <li>• Handouts</li> </ul>



Learning Unit	Learning Outcomes	Learning Elements	Materials Required
	<ol style="list-style-type: none"> <li>2. Perform continuity test</li> <li>3. Perform polarity test</li> <li>4. Perform earthing test</li> <li>5. Perform insulation test</li> <li>6. Record test results</li> </ol>	<p>test</p> <ul style="list-style-type: none"> <li>• Demonstrate electrical tests <ul style="list-style-type: none"> <li>○ continuity tests,</li> <li>○ insulation tests,</li> <li>○ earthing tests</li> <li>○ polarity tests.</li> </ul> </li> <li>• Demonstrate how to record and examine test results.</li> </ul> <p><b>Practice</b></p> <ul style="list-style-type: none"> <li>• Demonstrate continuity test with the help of megger of a house circuit.</li> <li>• Demonstrate insulation test with the help of Megger of a house circuit</li> <li>• Demonstrate polarity test with the help of Megger of a house circuit.</li> <li>• Demonstrate earthing test with the help of Megger/earth tester of a house circuit.</li> <li>• Find fault with the help of phase tester.</li> <li>• Find fault with the help of lamp taster.</li> <li>• Find fault with the help of series board.</li> <li>• Find fault by using VOM.</li> </ul>	<p>Videos</p> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>• Measuring tape</li> <li>• Insulated plier, insulated wire cutter, insulated screw driver set, VOM, Cable knife, Cable cutter, Solder iron, blow lamp, Insulation tape.</li> <li>• Megger</li> <li>• earth tester</li> <li>• phase tester</li> <li>• Lamp tester</li> </ul>

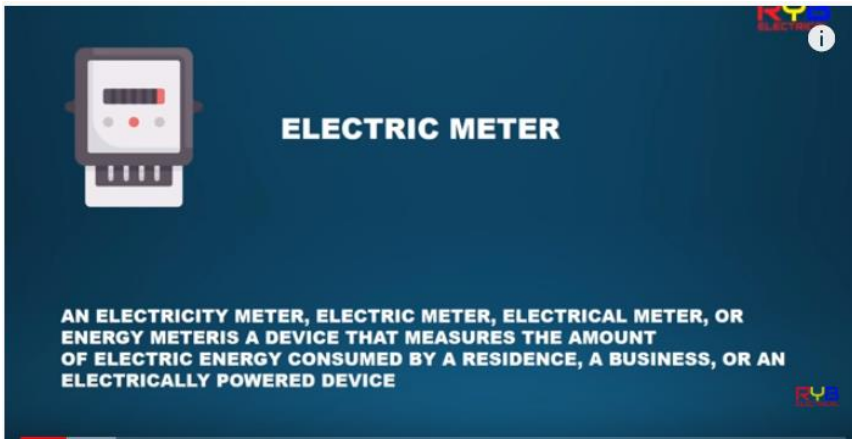
## Examples and illustrations

Module 2:



## How To Follow Wiring Diagrams

<https://www.youtube.com/watch?v=UbsiKI4upBM>



## ELECTRICAL SWITCH BOARD WIRING DIAGRAM

<https://www.youtube.com/watch?v=JmwL-3rhgwY>

## Electrical cable types:

For more details of cable type visit <https://www.systemswire.com/electrical-cable-types/>

- Coaxial cable – used for radio frequency signals, for example in cable television distribution systems.
- Communications cable

- Direct-buried cable
- Flexible cables
- Heliac cable
- Non-metallic sheathed cable (or nonmetallic building wire, NM, NM-B)
- Metallic sheathed cable (or armored cable, AC, or BX)
- Multicore cable (consist of more than one wire and is covered by cable jacket)
- Paired cable – Composed of two individually insulated conductors that are usually used in DC or low-frequency AC applications
- Portable cord – Flexible cable for AC power in portable applications
- Ribbon cable – Useful when many wires are required. This type of cable can easily flex, and It is designed to handle low-level voltages.
- Shielded cable – Used for sensitive electronic circuits or to provide protection in high-voltage applications.
- Single cable (from time to time this name is used for wire)
- Submersible cable
- Twinax cable
- Twin-lead – This type of cable is a flat two-wire line. It is commonly called a 300  $\Omega$  line because the line has an impedance of 300  $\Omega$ . It is often used as a transmission line between an antenna and a receiver (e.g., TV and radio). These cables are stranded to lower skin effects.
- Twisted pair – Consists of two interwound insulated wires. It resembles a paired cable, except that the paired wires are twisted

# SATELLITE DISH INSTALLER



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Module-3  
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National Vocational Certificate Level 2

Version 1 - October, 2019

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### Module 3: 0619001082 Perform Cable connection

**Objective of the module:** The objective of this module is to provide skills and knowledge related to Fix Splitter, Lay Coaxial Cables, Fix/Mount Diseqc Switch, Make Coaxial Cable Connections and Connect Input/ Output Cables.

**Duration**      **100** hours      **Theory:**      **10** hours      **Practical:**      **90** hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1: Fix Splitter	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. 1. Select splitter</li> <li>2. Make IF connecter with coaxial cable</li> <li>3. Mount splitter with screw</li> <li>4. Connect in/out cable with splitter.</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate splitter types               <ol style="list-style-type: none"> <li>a. 2 ports splitter</li> <li>b. 4 port splitter</li> </ol> </li> <li>2. Explain diagram of splitter and IF connector ssembly.</li> <li>3. Explain coaxial's mesh and inner core .</li> <li>4. Make connectors as per design</li> <li>5. Install splitter as per design</li> <li>6. Connect cable form LNB to splitter input port.</li> <li>7. Connect receiver cables to the output ports of splitter</li> </ol>	<p>Learner guide Multi-media projector Handouts Videos</p> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>• Steel roll/Steel wire</li> <li>• Gloves</li> <li>• Electric Drill Machine</li> <li>• Grip plier</li> <li>• Hacksaw</li> <li>• Thimble plier</li> <li>• Hammers</li> <li>• Vernier caliper</li> <li>• Measuring tape</li> <li>• Wire gauge</li> <li>• Micrometers</li> <li>• Wire stripper</li> <li>• Nose plier</li> <li>• Phase tester</li> <li>• Multi-meter</li> <li>• Plier</li> </ul>

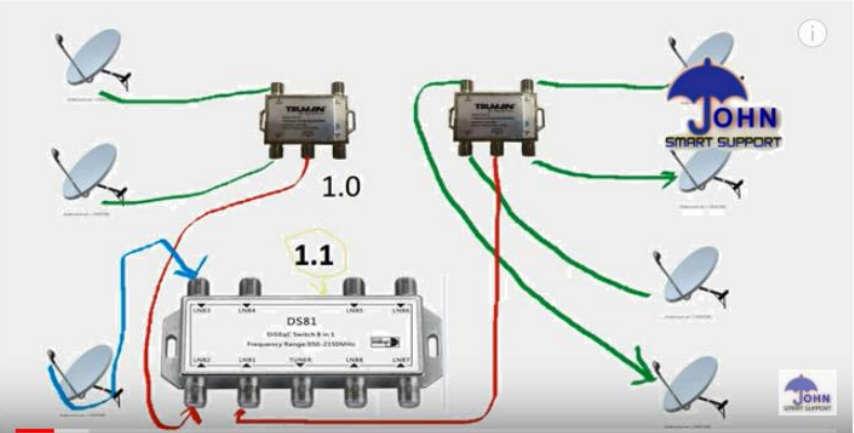

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
			<ul style="list-style-type: none"> <li>• Wire Tester</li> <li>• LAN Tester</li> <li>• Screw driver set</li> <li>• Side cutter</li> <li>• Coaxial Cable Stripper</li> <li>• Crimping Tool</li> <li>• Cable Compression Tool</li> </ul>
<b>LU2: Lay Coaxial Cables</b>	<b>The student will be able to:</b> <ol style="list-style-type: none"> <li>1. Measure cables as per route</li> <li>2. Select cable</li> <li>3. Perform ducting/piping</li> <li>4. Drill holes if required</li> <li>5. Lay cables as per standard.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain basic measuring unit(feet,inch,meter)</li> <li>2. Examine cable layout(cable route toward receiver)</li> <li>3. Measure cable length from dish to receiver</li> <li>4. Explain basic knowledge of ducting/piping</li> <li>5. Perform ducting</li> <li>6. Explain drilling principal</li> <li>7. Lay cables</li> </ol> <p><b>Practice-1</b> Measure cable length as per route. Install duct if require and lay cable</p>	Learner guide Multi-media projector Handouts Videos <b>Tools and Equipment as (LU1)</b>
<b>LU3: Fix/Mount Diseqc Switch</b>	<b>The student will be able to:</b> <ol style="list-style-type: none"> <li>1. Select Diseqc switch.</li> <li>2. Make IF connecter with coaxial cable</li> <li>3. Mount Diseqc switch with screw</li> <li>4. Connect in/out cable with Diseqc switch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain Diseqc switch</li> <li>2. Explain LNB and its types <ol style="list-style-type: none"> <li>a. KU band</li> <li>b. C band</li> </ol> </li> <li>3. Make IF connector</li> <li>4. Explain safety precaution of Diseqc Switch</li> <li>5. Install Diseqc Switch IN port with</li> </ol>	Learner guide Multi-media projector Handouts Videos <b>Tools and Equipment as (LU1)</b>

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
		<p>LNB</p> <p>6. Connect Diseqc switch OUT port with Reciver</p> <p><b>Practice-1</b></p> <p>Install Diseqc switch with LNB and reciver as per given requirments</p>	
<p><b>LU4:</b> Make Coaxial Cable Connections</p>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Make IF connecter with all coaxial cable</li> <li>2. Connect one end of cable with LNB/LNA.</li> <li>3. Connect other end in the input of Diseqc switch/Splitter.</li> <li>4. Connect one end of the cable at the output of Diseqc switch/Splitter.</li> <li>5. Connect other end of the cable with input of satellite receiver.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain LNB and its function</li> <li>2. Explain LNA and its function</li> <li>3. Explain Diseqc Switch Function</li> <li>4. Explain splitter function</li> <li>5. Make IF Connector</li> <li>6. Connect LNB/LNA and Diseqc Switch</li> </ol> <p><b>Practice-1</b></p> <p>Install Diseqc switch with LNB and 4 receivers using 4 port splitters</p>	<p>Learner guide Multi-media projector Handouts Videos <b>Tools and Equipment as (LU1)</b></p>
<p><b>LU5:</b> Connect Input/ Output Cables</p>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Select audio, video and HDMI cables as per standard</li> <li>2. Identify input/output ports of Display unit and Receiver</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain HDMI cable functions</li> <li>2. Explain audio / video cables function</li> <li>3. Demonstrate input/output ports on receiver</li> <li>4. Explain power supply functions</li> <li>5. Connect power supply with receiver and display</li> </ol> <p><b>Practice-1</b></p>	<p>• Learner guide Multi-media projector Handouts Videos <b>Tools and Equipment as (LU1)</b></p>

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
	3. Connect output of Receiver with input of Display unit 4. Connect power cables of Receiver and display unit with power supply	Install audio/video cables with receiver and display	



## Examples and illustrations

Video	Link
 <p>The diagram illustrates two configurations for multi-LNB setups. The top configuration, labeled '1.0', shows two satellite dishes connected to a DiSEqC switch, which is then connected to a single LNB. The bottom configuration, labeled '1.1', shows three satellite dishes connected to a DiSEqC switch, which is then connected to a single LNB. The LNB is labeled 'DS81' and 'DiSEqC Switch 2 in 1'. The diagram also includes the 'JOHN SMART SUPPORT' logo.</p>	<p>DiSEqC Switch 1.0 VS DiSEqC Switch 1.1   MULTI LNB SETTING <a href="https://www.youtube.com/watch?v=3X2qvDVTgP8">https://www.youtube.com/watch?v=3X2qvDVTgP8</a></p>
 <p>The image shows a close-up of a Dish LNB. The text 'Easy DTH FTA' is written in red at the top left. The text 'Made with KINEMASTER' is written in white at the top right. The text 'Dish LNB' is written in yellow at the bottom right. The LNB has a label that reads 'DC-20VDC3', '2-WAY SPLITTER', '5-1000MHz', and 'OUT'. The LNB is connected to a satellite dish.</p>	<p>Two TV One Dish / 2 Way Splitter Connection Setting <a href="https://www.youtube.com/watch?v=kJBroG0c48w">https://www.youtube.com/watch?v=kJBroG0c48w</a></p>



How to Install a Coax Cable F Connector with Common Tools

<https://www.youtube.com/watch?v=0i-YWTmC-I8>

### Types of Coaxial Connectors ( Link: <https://www.conwire.com/coaxial-cable-connector-types/>)

- **BNC**

Originally designed for military use, the Bayonet Neil-Concelman (BNC) coaxial connector is a miniature-to-subminiature RF connector used for quick connect/disconnect in RF equipment, test instruments, radio, television, and video signal. BNC connectors contain two bayonet lugs for a twisting interface on the female connector and are best suited for frequencies below 4GHz, as connectors lose mechanical stability as they get closer to 10 GHz.

- **TNC**

The Threaded Neil-Concelman is the threaded version of a BNC connector, that performs better microwave frequencies than BNC connectors. TNC Connectors are weatherproof, miniature units that operate up to 12 GHz and are commonly used in cellular phone and RF/antenna connections to resolve leakage and stability issues.

- **SMB**

Subminiature version B connectors are smaller versions of SMA connectors, and provide superior electrical performance from DC to 4 GHz. SMB connectors are one of the most popular RF/microwave connector variations for industrial and telecommunications equipment and offer a simple snap-on coupling design for semi-rigid cables with infrequent connections.

- **7/16 DIN**

The 7/16 DIN (Deutsches Institut für Normung) connector is a threaded RF connector for high-wattage transmissions in cellular networks, antenna systems with multiple transmitters, and defense applications. It can be used at up to 7.5 GHz and requires a wrench for tightening. The connector's name refers to the 7-mm inner diameter of the female inner contact and the 16-mm inner diameter of the overall outer contact.

- **QMA**

QMA connectors are the quick-lock and quick-disconnect variation of SMA connectors and feature the same internal construction. Offering faster and safer coupling and excellent performance in RF connections, QMA connectors are ideal for industrial and communications applications, as well as cable wiring, assembly, and repair.

- **MCX**

Micro coaxial connectors are small-form-factor connectors which are ideal for applications with space, size, or weight restrictions. Featuring a 30% smaller outer diameter than SMB connectors, MCX connectors operate between DC and 6 GHz in wireless, GPS, TV tuner cards, RF hardware, and digital cellular applications. MCX connectors also have a snap-on coupling design for simple, tool-free installation.

- **RCA**

The Radio Corporation of America connector, also known as a cinch connector, was originally designed for audio signal transmission but is now widely used in video, as well. Sometimes called A/V jacks, these cables are commonly recognized as the red, white, and yellow cords that plug into the back of televisions. Each of these cables features a male connector surrounded by a ring.

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## Module 4: 0619001083 Assemble Dish Antenna

**Objective of the module:** The objective of this module is to provide skills and knowledge related to Assemble Dish Stand, Combine Dish Pieces, Install Actuator, Mount LNB Support Arm for Downlink and Mount LNA Support Arm for Uplink.

**Duration**      **200** hours      **Theory:**      **20** hours      **Practical:**      **180** hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
<b>LU1:</b> Assemble Dish Stand	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Select tools and equipment</li> <li>2. Select dish stand as per size requirement</li> <li>3. Identify parts of stand</li> <li>4. Assemble stand of dish antenna as per drawing</li> </ol>	<ul style="list-style-type: none"> <li>• Explain tool required for assembly of dish antenna stand</li> <li>• Explain types of dish stand</li> <li>• Demonstrate Selection of tools as per dish antenna stand assembly</li> <li>• Brief components of dish antenna stand               <ul style="list-style-type: none"> <li>○ Actuator</li> <li>○ Elevation rod</li> <li>○ And more...</li> </ul> </li> <li>• Explain assembly diagram of stand</li> <li>• Demonstrate assembly of dish antenna stand as per design.</li> </ul> <p><b>Practice-1</b> Assemble 8 feet dish antenna stand in lab / site as per given diagram.</p>	<p>Learner guide Multi-media projector Handouts Videos</p> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>• Screw driver set</li> <li>• L-Key</li> <li>• Socket set</li> <li>• Drill Machine</li> <li>• Hammer</li> <li>• Pliers</li> <li>• Hack saw</li> <li>• Drill bits</li> <li>• Measuring tape</li> <li>• Spirit level</li> <li>• Satellite finder</li> <li>• Compass</li> <li>• Multi-meter</li> </ul>
<b>LU2:</b> Combine Dish Pieces	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Identify pieces of dish antenna</li> <li>2. Follow sequence of</li> </ol>	<ul style="list-style-type: none"> <li>• Explain different parts of dish antenna               <ul style="list-style-type: none"> <li>○ Feed horn</li> <li>○ Actuator Rod</li> <li>○ Elevation Rod</li> </ul> </li> </ul>	<p>Learner guide Multi-media projector Handouts</p>

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
	<p>dish pieces as per drawing</p> <p>3. Assemble dish pieces as per sequence</p>	<p>○ And More..</p> <p>Demonstrate how to follow sequence of dish pieces as per given drawing.</p> <p><b>Practice-1</b></p> <p>Assemble dish antenna as per given design in Lab / site</p>	<p>Videos</p> <p><b>Tools and Equipment as (LU1)</b></p>
<p><b>LU3:</b> Install Actuator</p>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Identify horizontal/vertical actuators</li> <li>2. Adjust arc of actuator between North and South</li> <li>3. Adjust arc of actuator between East and West</li> <li>4. Install limit switches</li> </ol>	<ul style="list-style-type: none"> <li>• Explain functions and types of actuators <ul style="list-style-type: none"> <li>○ Static</li> <li>○ Motorized</li> </ul> </li> <li>• Demonstrate function of actuator arc <ul style="list-style-type: none"> <li>○ Vertical/ Horizontal movements</li> </ul> </li> </ul> <p>Demonstrate adjustment of actuator arc.</p> <p><b>Practice-1</b></p> <p>Install and adjust actuator arc between North and south/ East and west.</p>	<p>Learner guide</p> <p>Multi-media projector</p> <p>Handouts</p> <p>Videos</p> <p><b>Tools and Equipment as (LU1)</b></p>
<p><b>LU4:</b> Calibrate measuring instruments</p>	<p><b>The student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Check calibration status of measuring tools.</li> <li>2. Perform calibration of measuring tools as per standards.</li> <li>3. Record calibration test results.</li> </ol>	<ul style="list-style-type: none"> <li>• Explain different types of band</li> <li>• Explain LNB types (C band, Ku band)</li> <li>• Explain function of LNB support arms</li> <li>• Demonstrate how to fix feed horn at the top of support arms</li> <li>• Demonstrate how to Mount LNB support arm on dish antenna as per focal length</li> <li>• Demonstrate fixing of dual feed horn for c band (5150~5750) and ku (9750 ~ 11550) bands and other bands as per requirement</li> </ul> <p><b>Practice-1</b></p>	<p>Learner guide</p> <p>Multi-media projector</p> <p>Handouts</p> <p>Videos</p> <p><b>Tools and Equipment as (LU1)</b></p>

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
		Mount LNB Support Arm for Downlink	
<b>LU5:</b> Mount LNA Support Arm for Uplink	<b>The student will be able to:</b> <ol style="list-style-type: none"> <li>1. Identify LNA support arm for uplink</li> <li>2. Mount LNA supports arm with satellite dish</li> <li>3. Fix feed-horn at the top of support arms</li> <li>4. Fix LNA in feed-horn as per focal length</li> <li>5. Connect LNA with transmitter though wave guide</li> </ol>	<ol style="list-style-type: none"> <li>1. •Explain function of LNA support arms and types</li> <li>2. Demonstrate feed horn and focal length</li> <li>3. Explain LNA types</li> <li>4. Demonstrate Mount LNA support arm on dish antenna</li> <li>5. Install feed horn on LNA support arms.</li> <li>6. Fix LNA in feed horn</li> </ol> <b>Practice-1</b> Mount LNA Support Arm for Downlink	<ul style="list-style-type: none"> <li>• Learner guide</li> </ul> Multi-media projector Handouts Videos <b>Tools and Equipment as (LU1)</b>

## Examples and illustrations



### How to Fitting of C Band 4 Feet Dish

<https://www.youtube.com/watch?v=7NDMQNgc7mE>

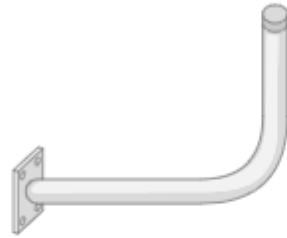
**Wall Mount settings for Satellite Dish Installation: (link: [https://puntodepartida.com/en/guides/point\\_and\\_install\\_satellite\\_dish/](https://puntodepartida.com/en/guides/point_and_install_satellite_dish/))**



## Required parts



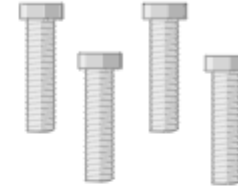
Satellite dish



'L' shaped wall mounts



4 stainless steel fixings



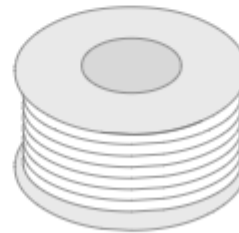
4 hexagonal screws



4 stainless steel fixings



'F' connector X 2



Coaxial cable



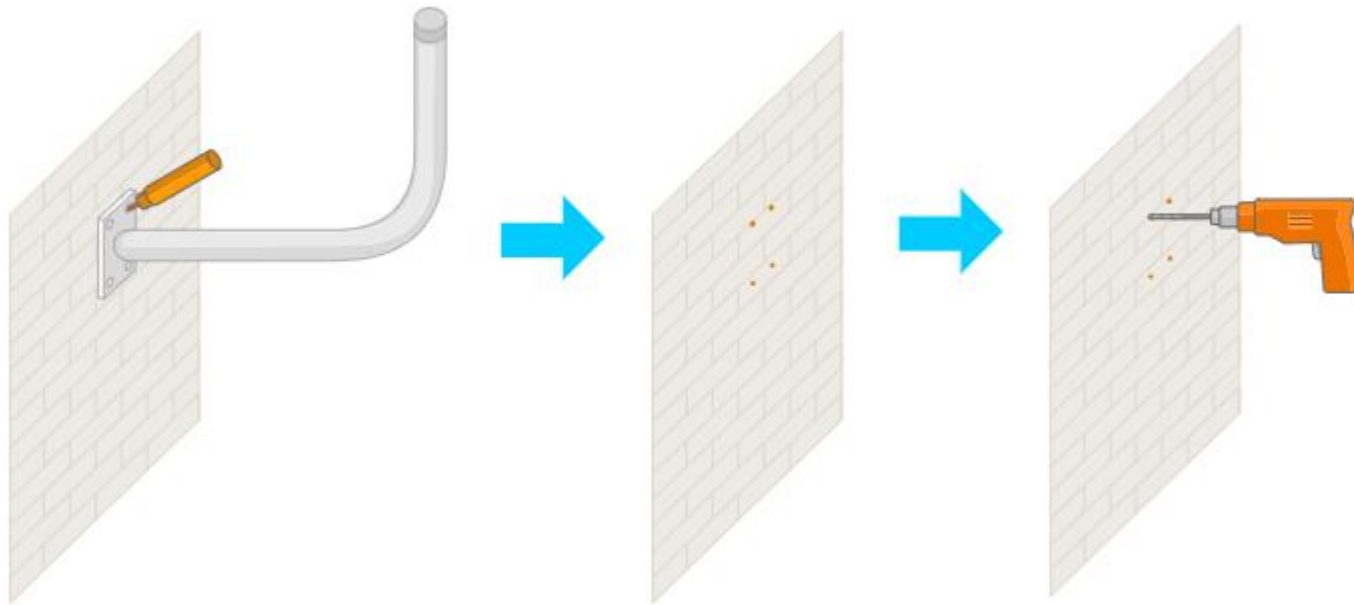
Digital TV receiver

## Installing the wall mount

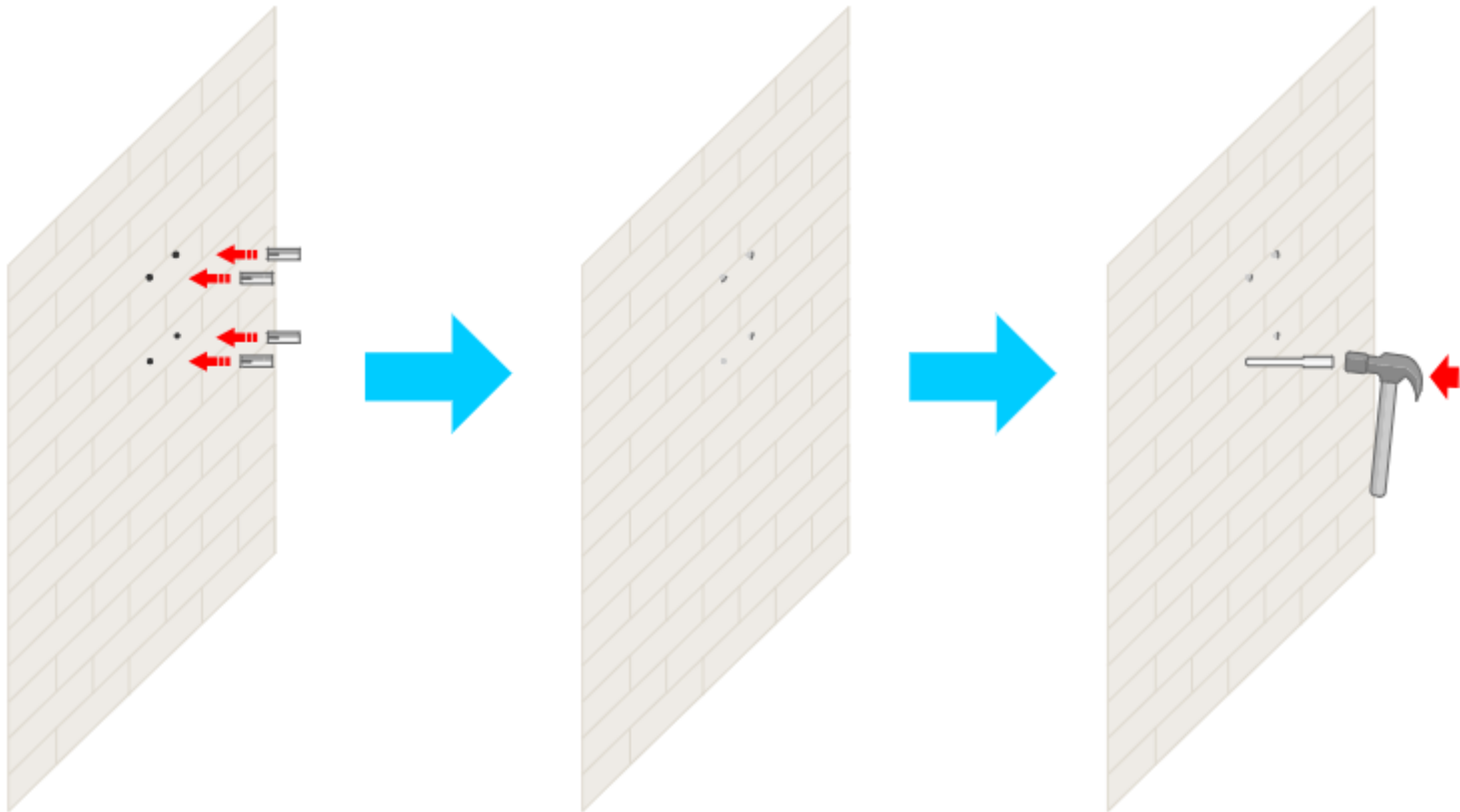
First of all, you have to find an appropriate location. Take into account these two requirements:

- The location must allow the correct orientation of the dish to the satellite. Use the compass.
- There can not be any obstacles between the dish and the satellite. You will learn where the satellite is in the following steps. Take the "L" wall mount, and attach it to the wall manually. Mark the positions of the future holes on the wall.

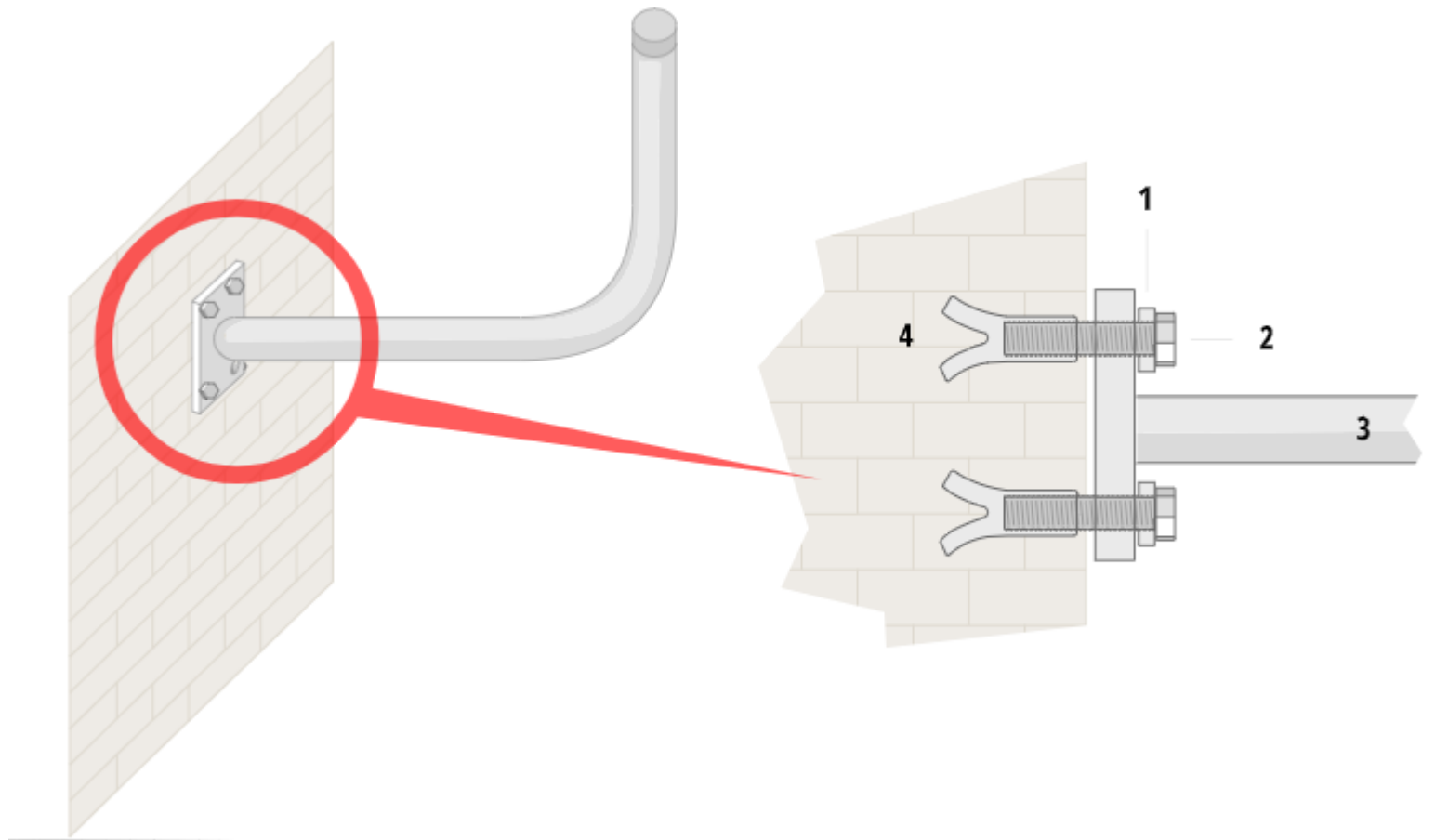
Now, drill the four holes. Be careful choosing a appropriate diameter (see the number engraved on the fixing). The ideal depth for the holes is about 0,5 cm + wall plug length.



Put the four fixings in their holes, and use the hammer and the chisel to fix them.

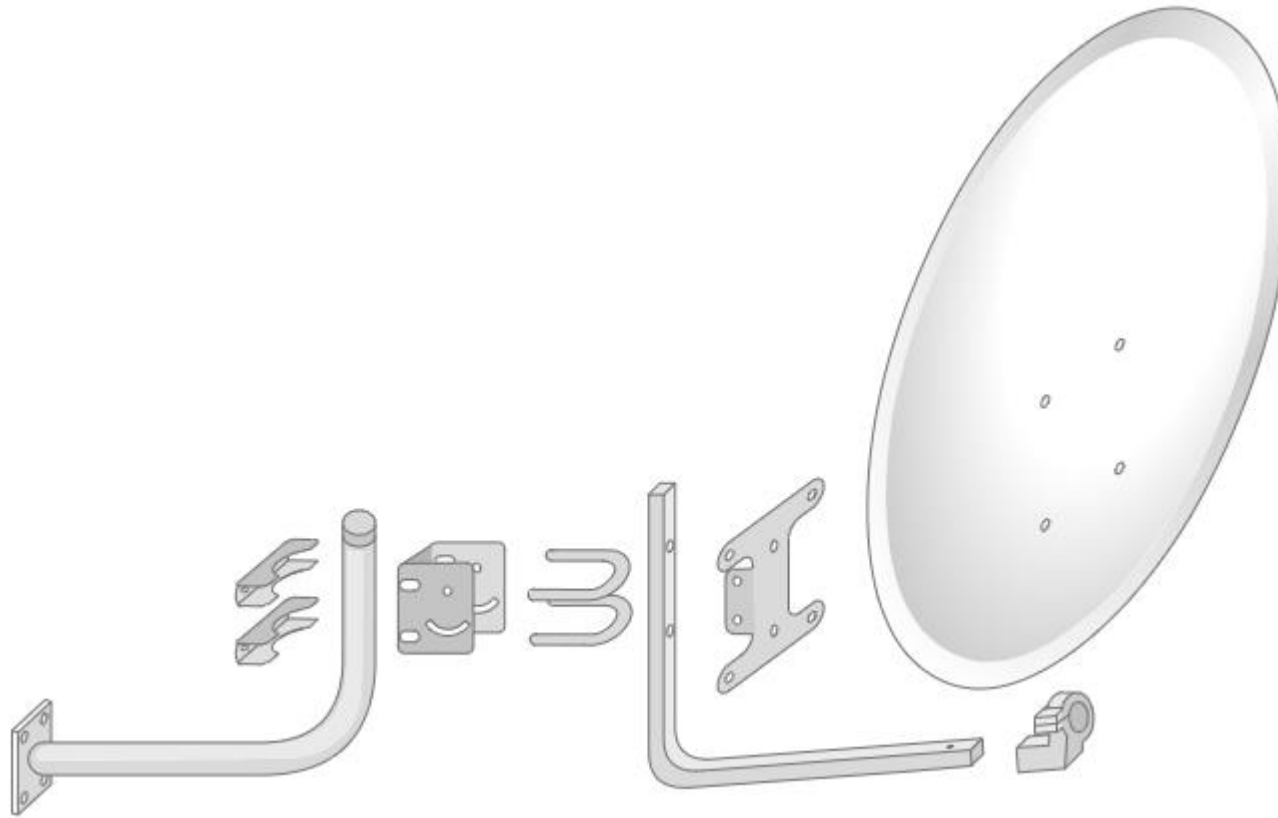


Now take the "L" wall mount, and screw it to the fixings. Don't forget the washers.

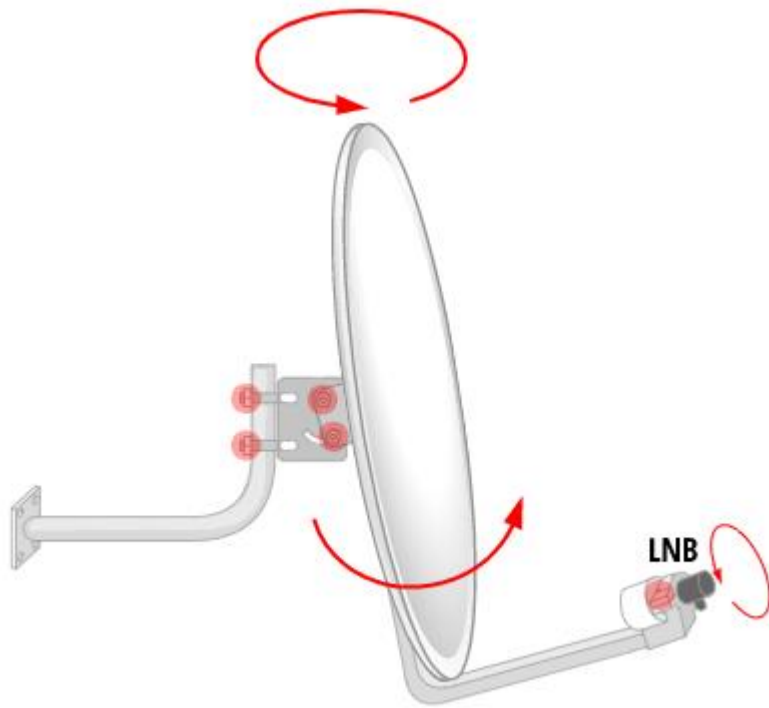


## Installing the dish

The installation process will vary depending on the brand and model of the dish. Take a look at the instructions booklet.



Mount it all, including the LNB, and screw it on tightly, except the screws that are marked in red. You will need to turn and move the dish to orientate it correctly.



## Pointing the dish to a satellite

Which satellite should you point the dish to?

It depends. You should visit [Lyngsat website](#) to find out what satellite is the most interesting for you.

## Overview of the program

<b>Course:</b> <i>Satellite Dish Installer, Level-2</i>	<b>Total Course Duration:</b> 450 hours
<b>Course Overview:</b>	
<p>The purpose of the training is to provide skilled manpower to improve the existing capacity of Electronics sector. This training will provide the requisite skills to the trainees to Install Satellite Dish. It will enable the participants to meet the challenges in the field of Satellite Dish industry. Further, to improve the skill level of the technician and prepare them for the Electronics industry to meet the market competition nationally and internationally.</p> <p>The core purpose of this qualification is to produce employable Satellite Dish Installer who could Install Satellite Dish according to national and international standards. In addition this qualification will prepare unemployable youth to employee in this sector.</p>	

Module	Learning Unit	Duration
<p><b>Module 2:</b> Develop Basic Electrical/ Electronic Skills</p> <p><b>Aim:</b> Objective of this module is to cover the skills and knowledge required to lay Electrical cables, perform single-phase AC Connection, Perform DC Connection, perform basic electric wiring and conduct wiring test.</p>	<p><b>LU1:</b> Lay Electrical cables</p> <p><b>LU2:</b> Perform single-phase AC Connection</p> <p><b>LU3:</b> Perform DC Connection</p> <p><b>LU4:</b> Perform Basic Electrical wiring</p> <p><b>LU5:</b> Conduct wiring Test</p>	150 hours
<p><b>Module 3:</b> Perform Cable Connection</p> <p><b>Aim:</b> The objective of this module is to provide skills and knowledge related to Fix Splitter, Lay Coaxial Cables, Fix/Mount Diseqc Switch, Make Coaxial Cable Connections</p>	<p><b>LU1:</b> Fix Splitter</p> <p><b>LU2:</b> Lay Coaxial Cables</p> <p><b>LU3:</b> Fix/Mount Diseqc Switch</p> <p><b>LU4:</b> Make Coaxial Cable Connections</p> <p><b>LU5:</b> Connect Input/ Output Cables</p>	100 hours

Module	Learning Unit	Duration
and Connect Input/ Output Cables		
<p><b>Module 4:</b> Assemble Dish Antenna</p> <p><b>Aim:</b> The objective of this module is to provide skills and knowledge related to Assemble Dish Stand, Combine Dish Pieces, Install Actuator, MountLNB Support Arm for Downlink and Mount LNA Support Arm for Uplink</p>	<p><b>LU1:</b> Assemble Dish Stand</p> <p><b>LU2:</b> Combine Dish Pieces</p> <p><b>LU3:</b> Install Actuator.</p> <p><b>LU4:</b> Mount LNB Support Arm for Downlink</p> <p><b>LU5:</b> Mount LNA Support Arm for Uplink</p>	200 hours



## Frequently Asked Questions

<p>1. What is Competency Based Training (CBT) and how is it different from currently offered trainings in institutes?</p>	<p>Competency-based training (CBT) is an approach to vocational education and training that places emphasis on what a person can do in the workplace as a result of completing a program of training. Compared to conventional programs, the competency based training is not primarily content based; it rather focuses on the competence requirement of the envisaged job role. The whole qualification refers to certain industry standard criterion and is modularized in nature rather than being course oriented.</p>
<p>2. What is the passing criterion for CBT certificate?</p>	<p>You shall be required to be declared “Competent” in the summative assessment to attain the certificate.</p>
<p>3. What are the entry requirements for this course?</p>	<p>The entry requirement for this course is as follow.</p> <ul style="list-style-type: none"> <li>• Middle (Grade 8) for level-1</li> <li>• Level-1 for level-2</li> <li>• Level-2 for level-3</li> <li>• Level-3 for level-4</li> </ul>
<p>4. How can I progress in my educational career after attaining this certificate?</p>	<p>You shall be able to progress further to National Vocational Certificate Level-4 in satellite Dish Installer; and take admission in a level-5, DAE or equivalent course. In certain case, you may be required to attain an equivalence certificate from The Inter Board Committee of Chairmen (IBCC).</p>
<p>5. If I have the experience and skills mentioned in the competency standards, do I still need to attend the course to attain this certificate?</p>	<p>You can opt to take part in the Recognition of Prior Learning (RPL) program by contacting the relevant training institute and getting assessed by providing the required evidences.</p>

6. What is the entry requirement for Recognition of Prior Learning program (RPL)?	There is no general entry requirement. The institute shall assess you, identify your competence gaps and offer you courses to cover the gaps; after which you can take up the final assessment.
7. Is there any age restriction for entry in this course or Recognition of Prior Learning program (RPL)?	There are no age restrictions to enter this course or take up the Recognition of Prior Learning program
8. What is the duration of this course?	The duration of the course work is .....
9. What are the class timings?	The classes are normally offered 25 days a month from 08:00am to 01:30pm. These may vary according to the practices of certain institutes.
10. What is equivalence of this certificate with other qualifications?	As per the national vocational qualifications framework, the level-4 certificate is equivalent to Matriculation. The criteria for equivalence and equivalence certificate can be obtained from The Inter Board Committee of Chairmen (IBCC).
11. What is the importance of this certificate in National and International job market?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). These standards are also recognized worldwide as all the standards are coded using international methodology and are accessible to the employers worldwide through NAVTTTC website.
12. Which jobs can I get after attaining this certificate? Are there job for this certificate in public sector as well?	<p>You shall be able to take up jobs in the Satellite Dish Installation industry with the following designations</p> <ul style="list-style-type: none"> <li>• Domestic Satellite Dish Installer</li> <li>• Industrial Satellite Dish Installer</li> <li>• Satellite dish Technician</li> <li>• Satellite dish supervisor</li> <li>• Satellite installation technician</li> <li>• Satellite dish Trainer</li> <li>• Cable distributor,</li> </ul>

	<ul style="list-style-type: none"> <li>• Internet Service Provider</li> <li>• TV Network distributor,</li> <li>• TV Technician</li> <li>• work in Telecommunication.</li> </ul>
13. What are possible career progressions in industry after attaining this certificate?	You shall be able to progress up to the level of supervisor after attaining sufficient experience, knowledge and skills during the job. Attaining additional relevant qualifications may aid your career advancement to even higher levels.
14. Is this certificate recognized by any competent authority in Pakistan?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). The official certificates shall be awarded by the relevant certificate awarding body.
15. Is on-the-job training mandatory for this certificate? If yes, what is the duration of on-the-job training?	On-the-job training is not a requirement for final / summative assessment of this certificate. However, taking up on-the-job training after or during the course work may add your chances to get a job afterwards.
16. How much salary can I get on job after attaining this certificate?	The minimum wages announced by the Government of Pakistan in 2019 are PKR 17,500. This may vary in subsequent years and different regions of the country. Progressive employers may pay more than the mentioned amount.
17. Are there any alternative certificates which I can take up?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
18. What is the teaching language of this course?	The teaching language of this course is Urdu and English.
19. Is it possible to switch to other certificate programs during the course?	Partially no, but if you have covered the Generic and functional competencies of this course and you want to switch to other certificate or want to enroll in other course, then you will take exemptions from the generic and functional competencies of the same level.
20. What is the examination / assessment system in this program?	Competency based assessments are organized by training institutes during the course which serve the purpose of assessing the progress and preparedness of each student. Final /

	summative assessments are organized by the relevant qualification awarding bodies at the end of the certificate program. You shall be required to be declared "Competent" in the summative assessment to attain the certificate.
21. Does this certificate enable me to work as freelancer?	Yes! You can start your small business of Installation of satellite dish or other telecom equipment. You may need additional skills on entrepreneurship to support your initiative.

## Test Yourself (Multiple Choice Questions)

### MODULE 2

- Question 1** Which of the following protects a cable against mechanical injury?
- A Bedding
  - B Sheath
  - C Armouring
  - D None of the above
- Question 2** **The thickness of the layer of insulation on the conductor, in cables, depends upon**
- A Reactive power
  - B Power factor
  - C Voltage
  - D Current carrying capacity

**Question 3** At time of installation of power cable technician follows electrical cables color codes, In case of three core flexible cable the colour of the neutral will be\_\_\_\_\_.

- A Blue
- B Black
- C Brown
- D None of the above

**Question 4** PVC stands for\_\_\_\_\_, it is third widely used plastic type and have been used mainly in construction of pipes.

- A Polyvinyl chloride
- B Post varnish conductor
- C Pressed and varnished cloth
- D Positive voltage conductor

**Question 5** Wire gauge standards are designed to give information about different physical sizes of the cables, What does S.W.G. stands for?

- A Standard Western Gauge
- B Swiss Wire Gauge
- C Swiss Western Gauge
- D Standard Wire Gauge

### MODULE 3

**Question 6** RG-59 is a type of coaxial cable which has fixed resistance and capacitance which makes it suitable for certain applications, RG-59 is used in

- A Radio
- B Thick Ethernet
- C Thin Ethernet
- D Cable TV

**Question 7** Twisted pair cable in which metal casing improves penetration of noise or crosstalk is called

- A insulated twisted pair cable
- B Shielded twisted pair cable
- C Unshielded twisted pair cable
- D Both A & B

**Question 8** Which switch is used to control multiple LNBS?

- A DiseqC
- B AC
- C DC
- D Coaxial



**Question 9** What are the four main types of coaxial cables?

A SDI,CCTV,VIOC,MP3

B TIVE,RG69,PLAYER,CATV

C BOID,CCTV,CATV,CoaxialCable

D CCTV,SDI,CATV,Quad-Shielded CATV

**Question 10** When was the coaxial cable invented?

A 1939

B 1929

C 1987

D 1880

## MODULE 4

**Question 11** What is the wavelength of Super high frequency (SHF) especially used in Radar & satellite communication?

- A 1 m – 10 m
- B 1 cm – 10 cm
- C 10 cm – 1 m
- D 0.1 cm – 1 cm

**Question 12** For which band/s is the space wave propagation suitable over 30 MHz?

- A VHF
- B SHF
- C UHF
- D All of the above

**Question 13** INTELSAT stands for\_\_\_\_\_, an international company which provide satellite communication services and equipment.

- A Intel Satellite
- B International Telephone Satellite
- C International Telecommunications Satellite
- D International Satellite

**Question 14** What is the approximate path loss from satellite-to-earth station?

- A 100 db
- B 150 db
- C 175 db
- D 200 db

**Question 15** A satellite contains a big collection of electrical and communication devices, Repeaters inside communications satellite are known as\_\_\_\_\_.

- A Trancievers
- B Transponders
- C Transducers
- D BTS

