Section 4 - Pre wire Standards Residential Homes

Telephone and Data Wiring Guide For Residential Homes

General Information

Facts Every Home/Building Owner Should Know

The point where TELUS ownership ends is called the Service Provider Demarcation Point. The Service Provider Demarcation Point means the point of interconnection of TELUS' Basic Service and the customer-provided premise wiring. Often this point is a small grey box called a NIB (Network Interface Box), located on the exterior of your house.

As an owner or customer you are responsible for the installation, maintenance and repair of all voice and data wiring and jacks beyond the Service Provider Demarcation Point, in the same way as you are responsible for electrical wiring inside your home or building. Your telephone wiring must meet Federal wiring standards that are designed to ensure user safety. TELUS does not allow the connection of non-standard telephone wiring to the TELUS Network Protection Device or Customer Connecting Block.

One of the benefits of being responsible for telephone wiring is that you're free to choose the installation or repair method of your choice. If you are building a new home or renovating, be sure to pre-wire your telephone and data needs before the drywall is installed. You can consult your Yellow Pages Directory for a list of qualified building or electrical contractors, or do the job yourself.

What You Need To Know As a Customer

As a customer, you are responsible for the installation, maintenance and repair of all telephone wiring beyond the Service Provider Demarcation Point. If you require installation or repair of telephone wiring or jacks inside the building where you live, and you are not the building owner, you should discuss your requirements with your property manager/owner.

Purpose of Guide

This guide is intended to assist you in pre-wiring your new residence for telephone service. This guide applies only to wood frame single family residences.

What You Are Liable For?

Although your wiring efforts will have their most immediate impact on your own service, you must realize that you are also making changes to a much larger system and affecting service to future owners. For this and other reasons, you must understand your liability.

you, the customer, are responsible for:

- Installing your premise's wiring according to the technical standards and codes in effect at the time of installation. If you have questions, contact your local TELUS Office.
- Correcting any service difficulty that you create which harms the telecommunications network.
- Paying a service charge when TELUS makes a repair visit to your premises in order to remedy problems resulting from customer-installed wiring that has been improperly installed or maintained.
- Assuming the following risks when installing or maintaining customer-installed wiring: loss of service, damage to property, personal injury or injury to your agent.
- What this means is that TELUS will not be responsible for any liability claims arising from customer-installed or maintained premises wiring.

Description of Prewiring

Pre-wiring is a method of installing cabling so that it is concealed within the interior partition walls of your home. Pre-wiring is done at the framing (or hollow frame) stage at the same time as the electrical wiring, and before the application of insulation, drywall, and vapour barrier. Once the walls have been surfaced, existing wiring cannot be removed or replaced without disturbing the wall.

Electrical Permit and Inspection

The Canadian Electrical Code and the Provincial Electrical Inspection Branch may require you to apply for a permit when pre-wiring, adding to, or rearranging the telephone wiring. You may also be required to have the work inspected upon completion. Contact your local (Provincial or Municipal) Electrical Inspection Branch for further information.

If outlets are to be located in exterior walls (or walls between suites) contact your local Building Inspector for advice on maintaining the integrity of the vapour barrier or fire-rated wall.

Outlets (jack hardware) should be CSA certified for the intended purpose (for example, indoor or outdoor locations).

Waiver of Responsibility

TELUS shall not be liable to the user, or any other person, for damages or loss of any kind or nature, injury or death resulting from the user's or any other person's unfamiliarity with the Canadian Electrical Code, The Provincial Electrical Inspection Act, or any other law or regulation applicable to pre-wiring, or for reliance by the user or any other person on the instruction in this Guide. Any pre-wiring by the user or any other person pursuant to this Guide is entirely at the user's or any other person's own risk.

Planning Outlet Locations and Cable Routes

Telephone and Data Locations

Select locations to suit both your present and future needs. TELUS suggests you consider a minimum standard of two CAT5e set runs in each of the areas shown here in Diagram 1.

To enable your home for enhanced systems, or, as a smart home, it is recommended that the pre-wired set runs be terminated at a **central location (ESC)** within the home that will allow for the placement of inside wire termination modules, switches and programmable equipment that your system may require (see Diagram 1).

It is recommended that two CAT5e 4 pair cable runs be placed in a flexible conduit between the NIB (Network Interface Box) on the exterior of the home and the central location inside the home (see Diagram 1).

TELUS recommends that a No. 6 insulated ground wire is provided from and connected to the power service ground to the NIB (Network Interface Box).

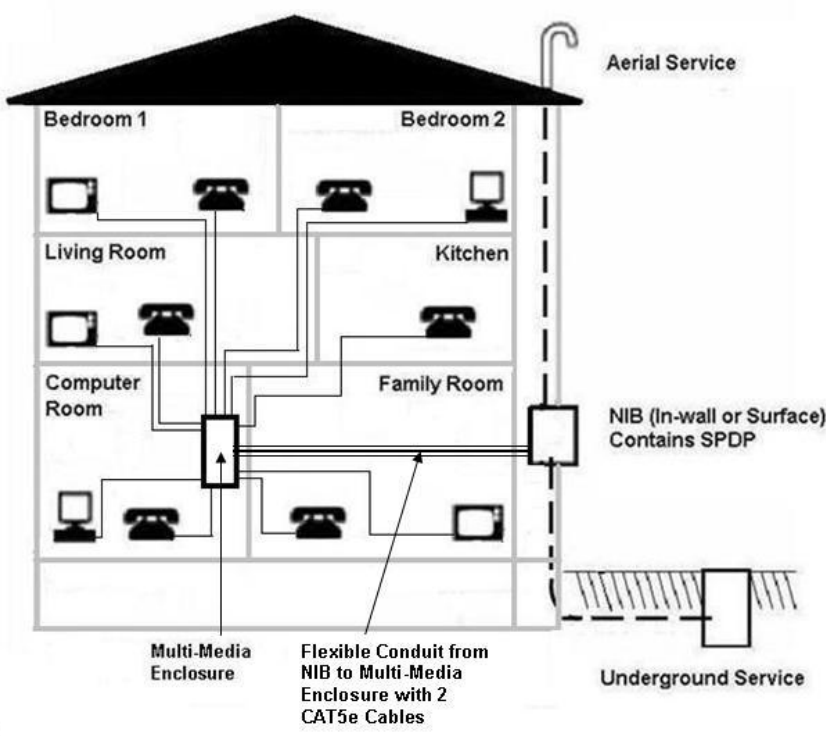
It is not necessary to have telephones and computers connected at every pre-wired location, however, by planning ahead you reduce the cost of future outlet installations. Adequate wiring will give you flexibility in arranging your telephone and data services in the future.

Please refer to Form **P546 Connection To Single Family Residence** (BC) or **P630 Alberta Residential Service up to 2 Units** (AB) for connection to TELUS service and owner / developer's support and housing requirements.

Wiring Standards (see section on Wire and Hardware) should also be considered to accommodate for tomorrow's communication technologies. Security wiring and cablevision wire should also be planned at this time.

TELUS must be contacted when the pathway is in place to install the service entrance wire and the protection/demarcation module.

Diagram 1



LEGEND

TELEPHONE
TELEVISION
COMPUTER

ESC ETHERNET SWITCH / CROSS CONNECT
NIB NETWORK INTERFACE BOX (NIB)

SPDP: SERVICE PROVIDER DEMARCATION POINT

DEMARCATION POINT: A POINT WHERE THE OPERATIONAL CONTROL OR OWNERSHIP CHANGES

Cable Routes

Plan the route to avoid possible damage from future construction, rubbing, overheating, dampness, or contact with power wires. The Canadian Electrical Code, Part 1, (Rule 60-300) requires a minimum of 50 mm (approximately 2") separation from power cables. The route must follow a supported path through floor joists, over ceilings, through wall studs, and behind baseboards. If possible, the route you select should conceal the cable. A separate telephone cable to each jack from your wiring block is recommended. The separate runs will allow for ease of movement and arrangement of your telephone services (lines), reduce time to locate faults and allow sufficient cable pairs for maintenance.

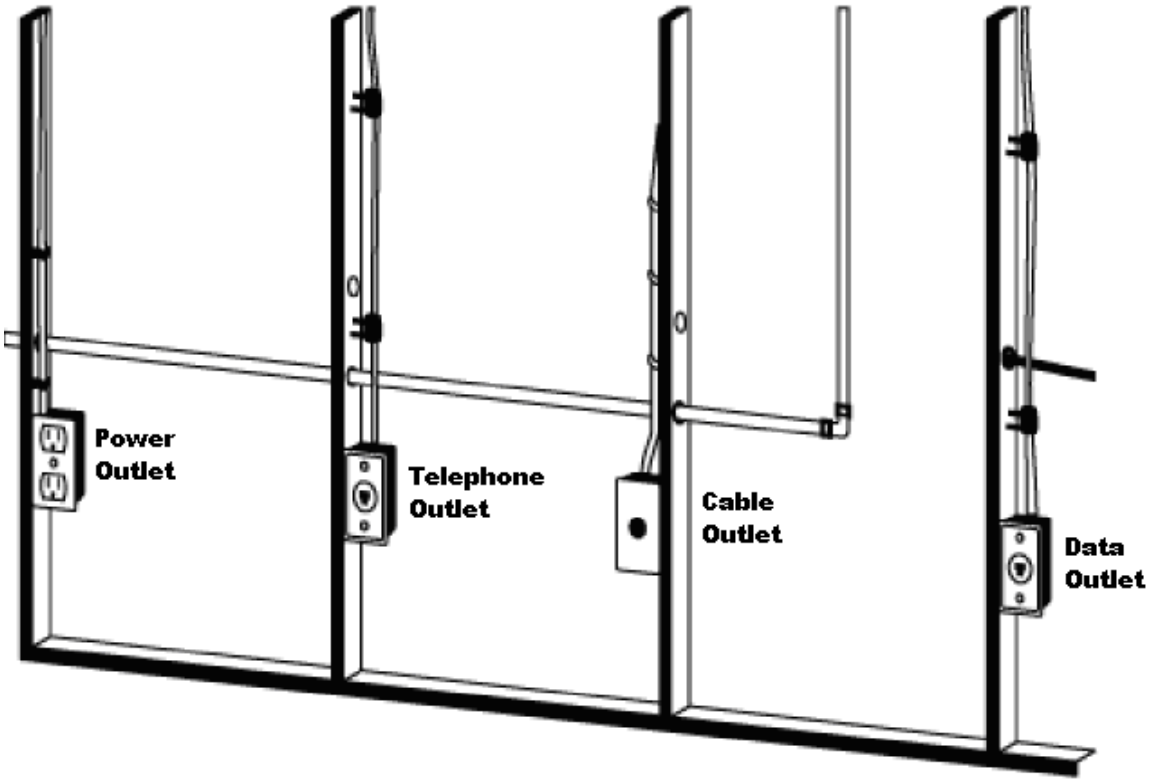
Notes: See Diagram 2

Wiring should not be run parallel to power cables within the same stud or joist space; otherwise transmission problems may be experienced.

Do not pull CAT5e cables through holes occupied by electrical cables.

The outlets should not be located between the same studs as a power outlet. Place an outlet box at each location, prior to cladding the wall.

DIAGRAM 2

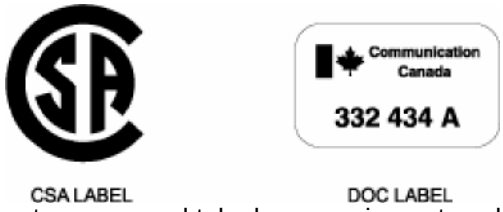


Telephones in Bathrooms

The Canada Electrical Code, Rule 60-400: Communication equipment in bathrooms states: “Communication equipment located in a bathroom shall be permanently fixed on the wall, and shall be located so that no part may be reached or used from the bath or from the shower enclosure.” Telephone jacks are not permitted in bathrooms. Permanently fixed communication equipment would require installation by a telecommunication technician.

What Type of Telephone to Connect?

It should be approved by the Department of Communications (DOC) and the Canadian Standards Association (CSA).



CSA LABEL DOC LABEL

Note: Faulty customer-owned telephone equipment could result in a service charge if TELUS is called to diagnose the problem.

Wire and Hardware

Wire Standards Specifications

Telecommunications and Data wiring must meet all local and Canadian Electrical Code Standards.

The minimum grade of inside wiring TELUS recommends is CAT 5e and must be Canadian Standards Association (CSA) approved, designated CMR (fire-rated) per CSA standard C22.2 No. 214-M90. The cable should have a minimum of four pairs twisted 24 AWG solid copper wires. The outside cover of the wire should be clearly stamped “CSA” or “cUL” and have a level CAT 5e (voice and data) transmission rating.

Do not use flat wire such as telephone set line cord or lamp wire for pre-wiring, as it can cause transmission problems.

Identifying Conductors in Telephone Wires

To identify the conductors in new telephone wire strip off a portion of the outer sheath. This will expose the individual conductors which are twisted together in pairs. Each working telephone line requires one pair of conductors, and each pair consists of a Tip (T) and a Ring (R) conductor. The manufacturer identifies each conductor by a standard colour code as shown in Table 1.

TABLE 1

PAIR	COLOR CODE
1	White/Blue
	Blue
2	White/Orange
	Orange
3	White/Green
	Green
4	White/Brown
	Brown

Wire Terminations at Outlets

PAIRS (LINES)		COLOR CODE	TELEPHONE JACK (PINS) - USOC	DATA JACK (PINS) - 568A
1	TIP RING	WHITE WITH BLUE BAND BLUE WITH WHITE BAND	4 3	5 4
2	TIP RING	WHITE WITH ORANGE BAND ORANGE WITH WHITE BAND	2 5	3 6
3	TIP RING	WHITE WITH GREEN BAND GREEN WITH WHITE BAND	1 6	1 2
4	TIP RING	WHITE WITH BROWN BAND BROWN WITH WHITE BAND	N/A N/A	7 8

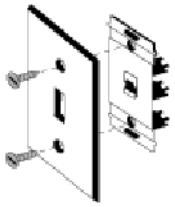
Types of Jack Hardware

Wall surface type - Wiring can be run either along the surface or inside the wall.

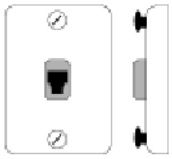
Flush-mounted type - Installed flush with the wall; requires an electrical outlet box or mud ring.

Baseboard type - Usually installed against a baseboard. Wiring is usually run along the surface of the wall.

All jack hardware should be GSA approved.



WALL SURFACE JACK

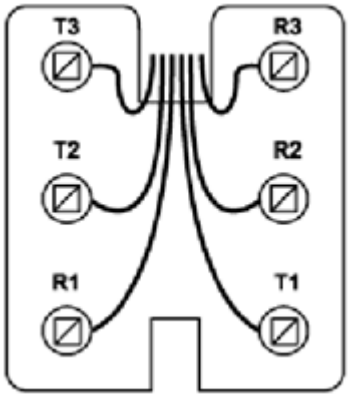


FLUSH MOUNTED JACK

BASEBOARD UNIT JACK

TELEPHONE JACK- RJ11

USOC



Screw Termination

DATA JACK – RJ45

568A

IDC (Insulation Displacement Connector) Termination

Installing Wire

See section on Planning Telephone Locations and Cable Routes.

The inside wiring should be done in a “star configuration” where the individual set runs from each telephone jack and TV location collect at a common location (ESC) within the home.

Fix a standard electrical outlet box (300 mm/12” above the floor) to a stud at each location that a telephone jack or end device (computer, television, etc.) may be required.

Run an individual CAT5e cable (4 pair, 24 AWG) from the central location (ESC) to each outlet location in each room that service is required. Two locations per room are recommended. (See Diagram 1).

When drilling through floor joists ensure that the structural integrity is not being jeopardized. Example: prefabricated joists may have manufacturers’ specification/location for drilling holes. Check with your design engineer/manufacturer or building inspector.

Where required, secure the cable every 600 mm, (24”) with a round staple designed for the CAT5e wire. Avoid sharp edges and turns and do not kink the cable. If a staple pierces the cable, the entire length of cable should be replaced to prevent transmission problems.

Leave at least 300 mm, (12”) of excess cable at wall outlet locations and 600 mm, 24” at the ESC location for ease of connection.

It is recommended that two CAT5e cable runs are placed between the NIB (Network Interface Box) on the exterior of the home and the central location inside the home (see Diagram 1).

Connecting Telephone Service

Safety Precautions

Remember, when working on existing telephone service you may come in contact with small electrical currents. TELUS recommends that installation be carried out by a trained telephone technician.

Never work on telephone wiring during thunder and lightning storms.

To reduce possible feedback of hazardous voltages caused by lightning strikes or contact with high voltage power lines, never run premises wiring from your primary building to miscellaneous buildings on your property. Ask your local telephone business office to arrange for a safe connection to other buildings when this is needed.

Service Connection

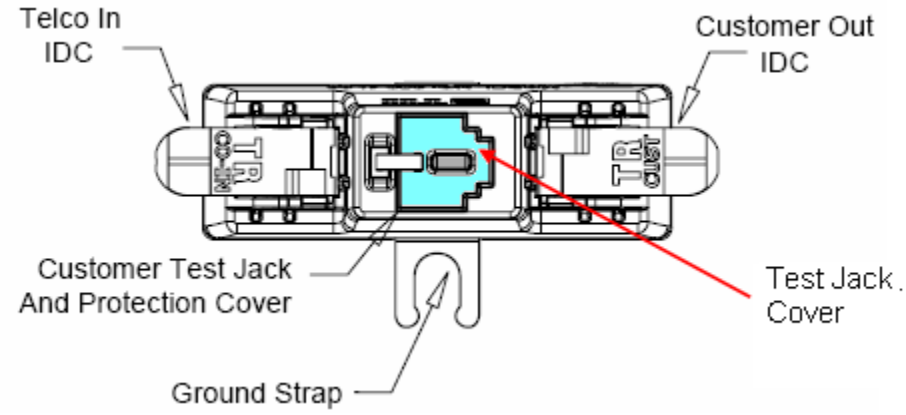
In new homes, TELUS terminates the telephone entrance cable (aerial or underground) in a NIB box located on the outside walls of your single family residential buildings. It is usually located close to the electrical meter. To gain access to the NIB box or NIB lid and to the demarcation jacks, loosen the screws and optional customer lock located on the right hand side of the NIB box or lid. With the outer door swung open, access to the demarcation jacks and or inside wire is now possible.

Customer Testing

Testing Instructions

Once service has been provided by TELUS, each jack and wire run should be checked as follows:

1. Plug in a telephone, lift the handset and listen for dial tone. If clear dial tone is heard, proceed directly to step 5. If no dial tone is heard or if excessive noise is heard after dialling a digit, proceed to step 2.
2. Ensure that all wire connections are secure. If dial tone is still not heard or excessive noise is heard, proceed to Step 3.
3. Test the line at the demarcation jack in the NIB (Network Interface Box) on the exterior of the home. Using a Phillips or Slotted screwdriver, open the NIB and lift the Customer Test Jack Cover located on the center of the Protection/Demarcation device and plug a standard telephone set in the test jack. Wait 1 minute before lifting the receiver and listening for dialtone. Proceed to Step 4.



4. Dial a digit and listen. Dial tone should stop and the line should be quiet.
   - If NO dial tone is heard or if excessive noise is heard after dialling a digit replace the Test Jack Cover, close the door of the NIB and secure with the screw and call TELUS Repair Service at 611 to report the trouble. End of testing.
   - If clear dial tone is heard and a test call can be completed, the fault is within the home and it is the responsibility of the homeowner to have the fault repaired. TELUS can be contacted to complete the repairs at additional time and charges.
5. Dial a digit and listen. Dial tone should stop and the line should be quiet. Try an outgoing call to ensure proper operation. Next try receiving a call, letting the telephone ring a minimum of 3 rings before answering it. If no noise is heard the test is complete and all wiring should be OK..

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