

# **GLOBALSTAR SERVICES & TERMINAL EQUIPMENT**

## **ANNEX A STATEMENT OF WORK**

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# **1 PART 1 - GENERAL REQUIREMENTS**

## **1.1 INTRODUCTION**

### **1.1.1 Globalstar Service**

1.1.1.1 Shared Services Canada (SSC) has a requirement for the provision, maintenance and operation of Globalstar Satellite as well as related services for use by its clients.

### **1.1.2 Division of Document into Parts**

1.1.2.1 This Statement of Work is divided into the following 5 Parts:

- a) Part 1 – General Requirements;
- b) Part 2 – General Requirements for Provision, Maintenance & Operations;
- c) Part 3 – Globalstar Airtime Services Requirements;
- d) Part 4 – Globalstar Terminal Requirements;
- e) Part 5 – Glossary and Definitions.

## 2 PART 2 – GENERAL REQUIREMENTS FOR SERVICE, MAINTENANCE AND OPERATIONS

### 2.1 GENERAL

2.1.1.1 The Contractor must provide the following services to Canada:

- a) Client Support (on-going);
- b) Problem Management (on-going);
- c) Service Performance Monitoring (on-going);
- d) Terminal Equipment Warranty and Repair Services (on-going);
- e) Scheduled Service-affecting Advisory (on-going);
- f) Account Management (on-going);
- g) Reporting (on-going);
- h) Billing (on-going);
- i) Availability of devices (on-going);
- j) Packaging, Shipping and Delivery (on-going);
- k) Installation and repair services (as and when requested); and
- l) Training (as and when requested).

2.1.1.2 The Contractor must provide warranty services to Canada for all terminal equipment. The words “**terminal equipment**” in this Contract refers to the terminal itself, as well as any parts of it, and any ancillary equipment.

2.1.1.3 The Contractor must ensure that all verbal, written and electronic communications that are required to be provided directly to Clients (e.g. client support, recorded greetings and prompts, email and Voice Mail) are available at all times in both official languages of Canada (English and French), offering users a choice of either language depending on their individual preference.

2.1.1.4 The Contractor must designate a representative who will serve as primary point-of-contact for both management and technical matters.

### 2.2 CLIENT SUPPORT

#### 2.2.1 Help Desk

2.2.1.1 The Contractor must provide the Client with technical support through a help desk accessible using a toll-free number available within North America. The Contractor must also provide the technical support through an abbreviated toll-free number accessible from any Mobile Terminal.

2.2.1.2 The Contractor's help desk support representatives must respond to Client user questions and, to the extent possible, resolve user problems and provide advice regarding configuration problems relating to all the terminals, accessories and services supplied under this Contract.

2.2.1.3 The Contractor must log and track all reported calls to the help desk from the time of initial report until the resolution of the problem. This must be done through a computerized logging system.

2.2.1.4 The Contractor's help desk must be staffed and available to the Client using the toll-free number 24 hours a day, every day of the year.

2.2.1.5 As and when requested from the Technical Authority, the Contractor must send the log of reported calls, for the requested date range, via email within 2 business days of the request. The report must show the following:

- a) Help desk summary (for the given date range) including the following:
  - i) Number of calls logged and resolved;
  - ii) Average time taken to answer the telephone;
  - iii) Total number of calls; and
  - iv) Total number of emails.
- b) Detail Listing (for the given date range) including the following:
  - i) Ticket number;
  - ii) Date ticket was logged;
  - iii) Time ticket was logged;
  - iv) Contact information of who reported the problem:
    - (A) Name;
    - (B) Phone number;
    - (C) Email address; and
    - (D) Government Department.
  - v) Description of the problem;
  - vi) Resolution of the problem; and
  - vii) Status (open or closed).

## 2.2.2 Engineering Assistance

2.2.2.1 The Contractor must provide engineering assistance to the Technical Authority accessible using a North American phone number separate from the help desk toll-free number.

2.2.2.2 The Contractor must assist with issues requiring technical expertise at a level greater than the help desk. This could include, but not be limited to:

- a) Compatibility issues;
- b) Supported encryption protocols; and
- c) Intermittent or chronic performance issues.

2.2.2.3 The Contractor's Engineering Assistance must be available Monday to Friday from 9:00 AM to 5:00 PM Eastern Time to receive and respond to calls.

## 2.3 PROBLEM MANAGEMENT

### 2.3.1 General

2.3.1.1 The Contractor must manage all problems affecting the delivery of services under this Contract. These problems must be managed 24 hours a day, every day of the year, by the Contractor by diagnosing, tracking, recording and reporting on all problems that affect any Client user's ability to use the Globalstar Satellite Service(s). This includes all hardware, network and service problems. The Contractor must document all problems, including a description of the problem and all details on how the problem was resolved.

2.3.1.2 If the Contractor determines that a problem is a terminal equipment issue; the Contractor must refer the Client to the Contractor's repair centre.

2.3.1.3 The Contractor must perform remote network monitoring, preventative diagnostics and co-ordinate problem isolation and resolution.

- 2.3.1.4 The Contractor must perform the following activities on an on-going basis when handling network or service-related problems:
- a) identify each reported problem by a unique problem record number (ticket number);
  - b) perform an analysis of the problem reported;
  - c) maintain an audit trail that includes all actions taken until the problem is resolved; and
  - d) provide reports as listed in the Section named "Reports".
- 2.3.1.5 The Contractor must be the single point of contact and have full responsibility for leading and coordinating all activities with any terrestrial provider, Internet Service Provider (ISP), local exchange carrier (LEC), or interexchange carrier (IXC) for the resolution of any problem that affects the performance of the Globalstar Satellite Service.
- 2.3.1.6 The Contractor must provide a "problem record" number to the reporting Client that permits the Client and any other representative of Canada to quote the problem record number for any reason.

## 2.3.2 Escalation Procedures

- 2.3.2.1 Depending on the severity of the problem where it affects the usage of the services, the Contractor must be ready to address SSC reporting requirements based on escalation timelines below. The Contractor must provide regular updates (intervals defined by the next escalation level) for which the incident has been identified and categorized and as defined below. The Contractor must provide the names and titles of the Contractor's Management escalation levels within their organization at contract award.
- 2.3.2.2 Escalation time lines (which are in effect 24 hours/day, 7 days/week):

SSC Management Escalation Levels	Contractor's Management Escalation Levels	Low Severity	Medium Severity	High Severity
SSC Manager Operations	Level 1	8 hours	4 hours	30 minutes
SSC Director Operations	Level 2	12 hours	8 hours	1 hour
SSC Director General Operations	Level 3	24 hours	12 hours	2 hours

Note: All escalation times listed in table above start running when the initial request is made.

- a) **Low Severity:** Diminished capacity (including repeated intermittent availability) of the network affecting any single, or group of, satellite terminals(s) for, or during, a continuous period exceeding 8 hours (excluding scheduled maintenance as defined in Section 2.7).
- b) **Medium Severity:** Diminished capacity (including repeated intermittent availability) of the network affecting any Globalstar Satellite Service for, or during, a continuous period exceeding 4 hours (excluding scheduled maintenance as defined in Section 2.7).

- c) **High Severity:** Complete unavailability of the network affecting any Globalstar Satellite Service, including the complete failure of a satellite for a period exceeding 30 minutes (excluding scheduled maintenance as defined in Section 2.7).

2.3.2.3 The Contractor must continue to provide an updated list via email of the Contractor's Management Escalation Levels to the Technical Authority as changes in personnel occur in the management positions listed above.

2.3.2.4 The Contractor must meet with the Technical Authority on a regular basis, if requested, to review outage reports, and any other information related to service availability, to ensure availability requirements are being met.

## 2.4 SERVICE PERFORMANCE MONITORING

### 2.4.1 Minimum Availability of Globalstar Voice and Data Services

2.4.1.1 The services must be available at least 95% of the time when calculated based on the following formula.

2.4.1.2 The Actual Availability Level that is reported by the Contractor in the monthly Service Performance Level report must be calculated using the following formula:

$$[(TAT - TOT) / TAT] \times 100$$

where "**TAT**" is defined as the total availability time, which is the total available number of minutes in the reported month and is calculated by multiplying by the number of calendar days in the month, times 24 hours, times 60 minutes, (i.e., in April the TAT would be  $30 \times 24 \times 60 = 43200$ ); and

where "**TOT**" is defined as the total outage time, which is the average total number of minutes where the satellite signal as measured by the contractor is not available in the following cities: Vancouver, BC, Edmonton AB, Regina, SK, Winnipeg, MB, Toronto, ON, Quebec, QC, and St-John's, NFLD. This number does not include scheduled maintenance or sun transit downtime where the Contractor properly advised SSC in accordance with Section 2.7.

2.4.1.3 A Globalstar Satellite Service outage is defined as a failure of any network facilities that completely prevent successful processing of any of the Globalstar Satellite Service's functionalities. The network facilities include the satellite network (satellite and communications paths), Gateways, and terrestrial backhaul networks.

## 2.5 SCHEDULED SERVICE-AFFECTING AND MAINTENANCE ADVISORY

2.5.1.1 The Contractor must provide the Technical Authority with written notice of any planned scheduled maintenance that may affect service at least 5 business days before performing any scheduled maintenance.

2.5.1.2 Except in cases of emergency, the Contractor must notify the Technical Authority before proceeding with any unscheduled service-affecting maintenance activities. When possible, the Contractor agrees to coordinate unscheduled service-affecting maintenance activities with the Technical Authority. In cases of emergency, the Contractor must notify the Technical Authority as soon as possible after beginning the emergency unscheduled service-affecting maintenance activity, together with the reason for the unscheduled service and information about how long service will be affected.

## **2.6 ACCOUNT MANAGEMENT**

### **2.6.1 Account Representative**

2.6.1.1 The Contractor must assign an Account Representative (AR) to SSC, to address any technical and administrative issues and must have the following minimum level of experience:

- a) A minimum of 4 years of experience in the delivery of telecommunications experience within the last 10 years; and
- b) At least 1 year of experience in the delivery of Globalstar Satellite services within the last 4 years.

2.6.1.2 During the Contract Period, the Contractor must provide the résumé for each new AR to the Technical Authority for approval within 10 business days of the date the Contractor notifies the Technical Authority that a new AR is being assigned.

### **2.6.2 Meetings**

2.6.2.1 When requested, the AR must meet with the Technical Authority at a location agreed upon by Canada and the Contractor. Except in case of emergencies, Canada will provide the AR with at least 5 days of notice before a meeting.

2.6.2.2 When requested, the Contractor must provide sales and marketing support to Canada when Canada is communicating with existing and prospective Clients. This support may consist of attending meetings, participating in a telephone teleconference, providing literature (either electronic or paper) explaining Globalstar Satellite services and/or terminals, or otherwise assisting SSC in communicating with Clients about the Globalstar Satellite Services available under this Contract.

2.6.2.3 Attendance at all meetings is at the Contractor's own expense, including any travel and living expenses that may be incurred.

## **2.7 REPORTING**

### **2.7.1 General**

2.7.1.1 The Contractor must provide the monthly reports in an electronic format (in comma or tab delimited file format, MS Excel) by way of email. All reports must be sent to the Technical Authority, the Contracting Authority at the email addresses identified in Article 1.6 of the Contract.

### **2.7.2 Monthly Service Order Report**

2.7.2.1 The Contractor must provide the Monthly Service Order Reporting Form (Annex F) that provides a listing of all the Service Orders that have been issued against the contract on a monthly basis within 20 calendar days from the end of the billing period. The report must provide the following information:

- a) Service Order number;
- b) Date issued;
- c) Description of service;
- d) Client Name (Government Department);
- e) Service Order Amount;

i) Total Committed Value (\$); and

- ii) Spent/Billed amount;
- f) Applicable taxes;
- g) Total Value of Service Order amount including applicable taxes; and
- h) Status (Approved, Completed or Cancelled).

### **2.7.3 Contract Summary Report**

2.7.3.1 The Contractor must provide a quarterly Contract Summary Report to the Technical Authority, and Contracting Authority in order to track the total expenditures of the Contract to date. This report must include the following information:

- a) Government department;
- b) Monthly value of goods delivered, where applicable;
- c) Government Fiscal Year-to-date value of goods delivered, where applicable;
- d) Monthly value of services rendered;
- e) Government Fiscal Year-to-date value of services rendered;
- f) Contract-to-date value of goods delivered, where applicable; and
- g) Contract-to-date value of services delivered, where applicable.

2.7.3.2 The Contractor must provide the Contract Summary Report no later than the 21st day of the month following each quarter (i.e., January-March, April-June, July-September, October-December).

### **2.7.4 Outage Notifications**

2.7.4.1 The Contractor must provide the Technical Authority with an outage notification by email within the same timeframes indicated in the escalation procedures in section 2.4.2 for the Manager Operations. The report must contain:

- a) Reference number;
- b) Date;
- c) Outage start date and time;
- d) Name of the person and department reporting the incident;
- e) Description of the problem;
- f) Description of the proposed resolution; and
- g) Estimated time to restore.

2.7.4.2 The Contractor must send updates to the Technical Authority by email on regular basis as updates are available.

2.7.4.3 Once the Satellite Service(s) has been restored, the Contractor must notify the Technical Authority by email immediately.

## **2.8 INVOICING**

### **2.8.1 General**

2.8.1.1 The Contractor must establish a federal government master account with at least one sub-levels to 1) identify the SSC Clients. The account number must be 15 characters or less not including any special characters.

2.8.1.2 The Contractor must invoice Canada on a monthly basis for all one-time and recurring charges accounted for in that month based on a billing period of the first of the month until the last day of that month. Services that start part way during a calendar month will be prorated using the formula of: Total cost / number of days in billing month \* number of days the item is being

charged for. Equipment must be invoiced separately from services. All services and equipment must be delivered before it can be invoiced.

- 2.8.1.3 The Contractor must cooperate with the Technical Authority for the resolution of any billing issues to the satisfaction of the Technical Authority.

## 2.8.2 Invoices

2.8.2.1 In addition to the information required by General Conditions 2035, the Contractor must provide a printable and non-modifiable monthly summary invoice and a copy of Annex "B1" (if applicable) to the Contracting and Technical Authorities listed on the contract in Portable Document Format (PDF), which includes the Contractor's official letterhead or logo via email.

2.8.2.2 The Contractor must ensure that the summary invoice and Annex "B1" are received by the Contracting and Technical Authorities within 10 working days after the end of each billing period.

## 2.8.3 Usage File

2.8.3.1 The Contractor must provide the SSC with the Usage File for the monthly billing period.

2.8.3.2 The Usage File must be provided via email.

2.8.3.3 The Contractor must provide the Usage File in a comma-delimited file format. The specific formatting is provided in Appendix A to Annex A –Usage File Layout.

2.8.3.4 The Usage File must contain all usage for that invoicing period.

2.8.3.5 The Contractor must ensure that the file is received by the Technical Authority within 10 working days after the end of each billing period.

## 2.8.4 Service Delivery Intervals

2.8.4.1 The Service Delivery Interval (SDI) is defined as the elapsed time between the issuance of the Service Order and the delivery/acceptance of the service.

2.8.4.2 The Maximum Service Delivery Interval (MSDI) is defined as the maximum allowable amount of time to process a Service Order depending on the type and priority of that Service Order.

Service Order Type	MSDI for Regular Priority Service Orders	MSDI for Express Priority Service Orders
Service functionality activation, deactivation or change	8 hours	4 hours
Existing Terminal registration or deregistration	8 hours	4 hours
Delivery of new terminal(s) within Canada (for quantities of 10 or less)	10 business days	5 business days

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Delivery of new terminals within Canada (for quantities greater than 10)	20 business days	10 business days
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## 2.8.5 Service Order Completion Notification (SOCN)

2.8.5.1 The Contractor must issue a Service Order Completion Notification in order for SSC to verify and validate that the Globalstar Satellite services and equipment have been delivered per the Service Order. Any invoiced items related to a Service Order for which SSC has not received an SOCN will not be paid until the SOCN is received.

2.8.5.2 The Service Order Completion Notification must, at a minimum, provide Canada with:

- a) Service Order number;
- b) the serial or inventory numbers of all the terminals, Subscriber Identity Modules (SIMs) and/or accessories processed from this Service Order;
- c) all activated or deactivated service functionalities from this Service Order; and
- d) Service Order Completion Date.

### **3 PART 3 - GLOBALSTAR AIRTIME SERVICES REQUIREMENTS**

#### **3.1 GENERAL**

3.1.1.1 The Contractor must provide the following Globalstar Satellite Services:

- a) Circuit Switch Voice Services;
- b) Circuit Switch Data Services; and
- c) Simplex (one-way) Tracking and Messaging Services.

3.1.1.2 The Contractor must provide the following types of connectivity:

- a) Terminal to Terminal; and
- b) Terminal to Public Networks and Public Networks to Terminal.

#### **3.2 GLOBALSTAR CIRCUIT SWITCH SERVICE DESCRIPTION**

3.2.1.1 The Contractor's Globalstar Circuit Switch Service must provide the following service functionalities:

- a) Various monthly access plans (from minimal airtime included to unlimited airtime plans);
- b) Circuit-Switch Voice;
- c) Circuit-Switch Data (9.6 Kbps);
- d) Fax (9.6 Kbps);
- e) Call Forwarding Unconditional;
- f) Call Forwarding Busy;
- g) Call Forwarding No Reply; and
- h) Voice Mail.

#### **3.3 GLOBALSTAR SIMPLEX (ONE-WAY) TRACKING AND MESSAGING SERVICE DESCRIPTION**

3.3.1.1 The Contractor's Globalstar Simplex (one-way) Tracking and Messaging Service must provide the following service functionalities:

- a) Annual access plans;
- b) Position tracking and reporting;
- c) Capability to send messages to established contacts;
- d) Emergency alerting capabilities; and
- e) Near real-time tracking and history reporting from a Web based mapping application.

### **4 PART 4 – GLOBALSTAR TERMINAL REQUIREMENTS**

#### **4.1 GENERAL**

4.1.1.1 The Contractor must provide terminals and terminal support, as specified in this Contract, for all Clients throughout the Contract Period.

4.1.1.2 The terminal equipment supplied must be type-approved by Canada and Skyterra.

4.1.1.3 "Handheld" is defined as rechargeable, battery powered, lightweight and compact enough to be used in a hand-held configuration using an omni-directional antenna system.

- 4.1.1.4 "Fixed" is defined as AC or DC powered land operation systems designed to be used in fixed locations using self-tracking or non-tracking antenna systems
- 4.1.1.5 "Personal Tracking and Messaging" is defined as battery powered portable device that allows a person to easily carry with them and that can automatically send out GPS coordinates and also allows the user to send out Messages to their colleagues and friends. The device also allows to send out Emergency messages to allow for Search and Rescue personel to find the user that is in need of assistance.
- 4.1.1.6 "Vehicular Tracking" is defined as battery or DC powered device that installs on a vehicle or asset to provide tracking service in case of loss or theft.

## **4.2 GLOBALSTAR HANDHELD TERMINALS**

- 4.2.1.1 The Contractor must supply Globalstar Handheld Equipment.
- 4.2.1.2 Each Handheld Globalstar terminal must include:
- a) Portable Satellite Phone with Integrated Antenna;
  - b) High Capacity Battery allowing at least 30 hours of standby time and at least 3 hours of talk time;
  - c) All required accessories, software and documentation;
  - d) AC travel charger;
  - e) 12 Volt DC cigarette Lighter Adapter; and
  - f) Leather case for portable satellite phone;
- 4.2.1.3 Each terminal must allow the user to use the following functions:
- a) Circuit-Switch Voice;
  - b) Circuit-Switch Data; and
  - c) Fax.

## **4.3 GLOBALSTAR FIXED TERMINALS**

- 4.3.1.1 The Contractor must supply Globalstar Fixed Terminal Equipment.
- 4.3.1.2 Each Fixed Globalstar terminal must include:
- a) Outdoor Transceiver unit;
  - b) Indoor Junction box; and
  - c) All required accessories and documentation.
- 4.3.1.3 Each terminal must allow the user to use the following functions:
- a) Circuit-Switch Voice;
  - b) Circuit-Switch Data; and
  - c) Fax.

## **4.4 GLOBALSTAR WI-FI HOTSPOT PORTABLE PHONE EXTENDER**

- 4.4.1.1 The Contractor must supply Wi-Fi Hotspot Portable Phone Extender Globalstar Terminal Equipment.
- 4.4.1.2 Each Wi-Fi Hotspot Portable Phone Extender Globalstar terminal must include:

- a) Wi-Fi router optimized for use with Globalstar Portable Phones;
- b) Battery to allow autonomous operation for at least 4 hours;
- c) AC/DC charger; and
- d) All required accessories and documentation.

4.4.1.3 Each terminal must allow the user to use the following functions:

- a) Allow up to 4 users to connect simultaneously; and
- b) Provide Globalstar Data through connection with Wi-Fi.

## **4.5 GLOBALSTAR WI-FI HOTSPOT**

4.5.1.1 The Contractor must supply Wi-Fi Hotspot Globalstar Terminal Equipment.

4.5.1.2 Each Wi-Fi Hotspot Globalstar terminal must include:

- a) Choice of external omni-directional Antenna (Magnet Mount patch, Magnet mount marine, or Pole mount marine);
- b) Transceiver Unit with Wi-Fi antenna;
- c) At least 10 ft coaxial antenna cable;
- d) AC/DC charger;
- e) 12 VDC Car adapter; and
- f) All required accessories and documentation.

4.5.1.3 Each terminal must allow the user to use the following functions:

- a) Allow up to 8 users to connect simultaneously;
- b) Provide Globalstar Voice capability through an API or Application; and
- c) Provide Globalstar Data through connection with Wi-Fi.

## **4.6 GLOBALSTAR PERSONAL TRACKING AND MESSAGING TERMINALS**

4.6.1.1 The Contractor must supply Globalstar Personal Tracking and Messaging Terminal Equipment.

4.6.1.2 Each Personal Tracking and Messaging Globalstar terminal must include:

- a) The Satellite GPS simplex device; and
- b) All required accessories and documentation.

4.6.1.3 The device must have an Ingress protection rating of at least 7.

4.6.1.4 Each terminal must allow the user to use the following functions:

- a) Send out GPS location at desired interval from every 5 to 60 minutes;
- b) Send out pre-programmed custom messages to contacts; and
- c) Send out Emergency alerts.

## **4.7 GLOBALSTAR VEHICULAR TRACKING TERMINALS**

4.7.1.1 The Contractor must supply Globalstar Vehicular Tracking Terminal Equipment.

4.7.1.2 Each Vehicular Tracking Globalstar terminal must include:

- a) The Satellite GPS simplex device;

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- b) Cable to connect the tracking device to the DC power of the vehicle or the asset;  
and
- c) All required accessories and documentation.

4.7.1.3 Each terminal must allow the use of the following functions:

- a) Provide GPS Tracking of vehicle or asset;
- b) Provide movement alerts when the device senses that the vehicle or asset has moved;
- c) Provide a message when the device senses that it has been powered off;
- d) Provide a message when the battery is low in the tracking terminal; and
- e) Provide a status message once every 24 hours to ensure vehicle or asset is where it was left.

4.7.1.4 The device must have an Ingress protection rating of at least 7.

4.7.1.5 The Contractor must offer the following accessories for the Vehicular Tracking Terminal:

- a) Reversible mounting bracket;
- b) Industrial strength double-sided tape;
- c) Adhesive grip pad; and
- d) Adhesive Velcro strips.

## 5 PART 5 - GLOSSARY AND DEFINITIONS

- **bps (bits per second):** A unit of measurement for speed of data transfer or throughput.
- **Byte:** A string that consists of a number of bits, treated as a unit, and usually representing a character or a part of a character.
- **Call Forward:** Custom calling service which enables the customer to forward any calls automatically to any telephone that can be dialled directly. When call forwarding is activated by a customer, and calls to that line are automatically routed to another line designated during activation.
- **Circuit-Switch Voice:** This is equivalent in functionality to that of standard land-line cellular telephone service provided over the Public Switched Telephone Network (PSTN).
- **Data services:** This is how a terminal may send and receive electronic messages such as e-mail.
- **Kbps:** Kilobits per second
- **PSTN:** Public Switched Telephone Network.
- **Subscriber:** The eventual user or customer of a communication service or network. Subscribers can include individuals or organizations.
- **Terminal:** a satellite communication device used to access the Globalstar network with any of their mobile services.
- **Type-approved:** The official approval given by the carrier to a terminal model produced by an independent manufacturer when the terminal meets the technical standards defined by the carrier. Only models which have been granted type-approval (or case-approval) are permitted to operate via the carrier's network.
- **Ingress Protection:** The IP Code (or International Protection Rating, sometimes also interpreted as Ingress Protection Rating\*) consists of the letters IP followed by two digits and an optional letter. As defined in international standard IEC 60529, it classifies the degrees of protection provided against the intrusion of solid objects (including body parts like hands and fingers), dust, accidental contact, and water in electrical enclosures. The standard aims to provide users more detailed information than vague marketing terms such as waterproof. The digits (characteristic numerals) indicate conformity with the conditions summarized in the tables below. For example, an electrical socket rated IP22 is protected against insertion of fingers and will not be damaged or become unsafe during a specified test in which it is exposed to vertically or nearly vertically dripping water. IP22 or 2X are typical minimum requirements for the design of electrical accessories for indoor use.

First Digit: Solid - The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects.

Level	Object size protected against	Effective against
0	Not protected	No protection against contact and ingress of objects

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1	>50mm	Any large surface of the body, such as the back of the hand, but no protection against deliberate contact with a body part.
2	>12.5mm	Fingers or similar objects.
3	>2.5mm	Tools, thick wires, etc.
4	>1mm	Most wires, screws, etc.
5	Dust Protected	Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact.
6	Dust Tight	No ingress of dust; complete protection against contact.

Second Digit: Liquids - Protection of the equipment inside the enclosure against harmful ingress of water.

Level	Object size protected against	Effective against
0	Not protected	-
1	Dripping water	Dripping water (vertically falling drops) shall have no harmful effect.
2	Dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.
3	Spraying water	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.
4	Splashing water	Water splashing against the enclosure from any direction shall have no harmful effect.
5	Water jets	Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects.
6	Powerful water jets	Water projected in powerful jets (12.5mm nozzle) against the enclosure from any direction shall have no harmful effects.
7	Immersion up to 1m	Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time (up to 1 m of submersion).
8	Immersion beyond 1m	The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer. Normally, this will mean that the equipment is hermetically sealed. However, with certain types of equipment, it can mean that water can enter but only in such a manner that it produces no harmful effects