

Go Beyond

Gotonomi Module Installation Guide

V2.2

1 Contents

1	Contents	2
2	Glossary.....	4
3	Introduction	5
4	System overview.....	5
4.1	BGAN System overview	5
4.2	Gotonomi Module	5
4.4	Gotonomi Multilink Module	6
4.5	Gotonomi V200	6
4.7	External Interfaces	7
4.7.1	Gotonomi Module	7
4.7.2	Gotonomi Multilink.....	9
4.7.3	Gotonomi 200	10
5	Installation	11
5.1	Process	11
5.2	Storage and transport	11
5.3	Installation guidelines	11
5.3.1	Mechanical Guide	11
5.3.2	Thermal Management.....	12
5.3.3	IP Protection	13
5.3.4	Power and Ethernet Cable	13
5.3.5	Antenna and RF Cable	13
5.3.6	Satellite Coverage	14
5.3.7	Satellite Selection	14
5.3.8	Antenna positioning	14
5.3.9	Weather.....	16
5.3.10	GNSS.....	16
5.3.11	Power supply.....	17
5.3.12	Known sources of Interference.....	17
6	Maintenance	18
6.1	Servicing.....	18
7	User Terminal Operation	18
7.1	Terminal Interfaces Overview.....	18
7.1.1	IP Address.....	18
7.1.2	Certificates Username & Password	18
7.1.3	REST API Interface	18
7.1.4	AT Command Interface.....	18

7.1.5	WebUI Interface	18
7.1.6	Multilink Interface	18
7.2	WebUI	20
7.2.1	Dashboard	20
7.2.2	Connections	22
7.2.3	Upgrade	22
7.3	Satellite Data Link	22
7.3.1	Data rate	22
7.3.2	APN	23
7.3.3	PPPoE	23
7.4	Data rate control	24
8	Regulatory	25
8.1	Regulatory declaration information	25
8.1.1	Frequency use	25
8.2	Country Safety Certificates	25
8.3	Type Approval	26
8.4	Export control	29
9	Document Version History	30

2 Glossary

L-Band	1-2GHz part of the spectrum, here specifically used to mean 1525 and 1646.5 MHz
RPAS	Remotely Piloted Aircraft System
UAV	Unpiloted Aerial Vehicle
BGAN	Broadband Global Area Network
BVLoS	Beyond Visual Line of Sight
LTE	Long Term Evolution – 4G Cellular network
IMEI	International Mobile Equipment Identity Bit 8:15 form the TAC code Bit 2:7 are the serial number Bit 1 is the checksum
ICCID	Integrated Circuit Card Identifier
IMSI	International Mobile Subscriber Identity
APN	Access Point Name

3 Introduction

The Gotonomi range of satcom terminals are for operation on the Viasat BGAN Service. The terminals are designed to be low Size, Weight and Power and Cost (SWaP-C). They provide reliable data connectivity across a large proportion of the globe¹.

There are 3 different variants of the terminal in the range which address different capabilities and installation options. This document provides information on all three variants.

4 System overview

4.1 BGAN System overview

The Gotonomi terminals operate on the Viasat L-band Network. This comprises 4 geostationary satellites which give coverage across the globe. The satellites communicate with the terminals using Mobile Satellite System (MSS) frequencies (1.5-1.6GHz). All communication must go from the terminal, to the satellite, to the ground station; communication directly from terminal to terminal or from terminal to satellite to terminal is not possible.

4.2 Gotonomi Module

The Gotonomi Module is a satcom only solution. The terminal is 90mm x 90mm x 16mm and weighs 195g.



Figure 1 - Gotonomi Module

An external antenna is required for satellite connectivity.

¹ See section Satellite Coverage

4.4 Gotonomi Multilink Module

The Gotonomi Multilink Module integrates the satcom modem from the Gotonomi Module with an iMX8 System On Module (SOM) [DART-MX8MQ 1.600GHz 2048MB RAM, 16GB eMMC] and a 4G LTE modem chipset (Quectel EG21G). The terminal is 130mm x 90mm x 16mm and weighs 245g.

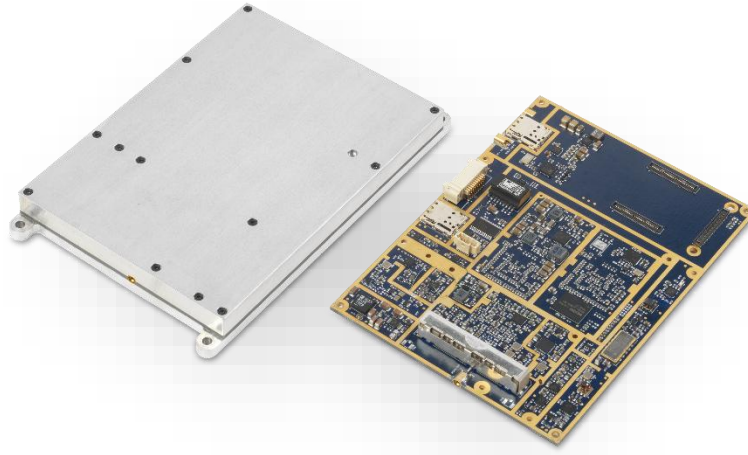


Figure 2 Gotonomi Multilink Module

4.5 Gotonomi V200

The Gotonomi V200 integrates the satcom modem from the Gotonomi Module with an integrated satcom antenna, providing a single item solution. The terminal is 145mm dia x 83mm and weighs 580g.



Figure 3 - Gotonomi V200

4.7 External Interfaces

4.7.1 Gotonomi Module

The Gotonomi Module has 3 external interfaces: Remotely Piloted Aircraft System (RPAS), RF & Satcom uSIM

4.7.1.1 RPAS

The Gotonomi Module has a side mounted 20 way socket, part number: T1M-10-GF-DH

The mating connector shell for this is the Samtec S1SD-10

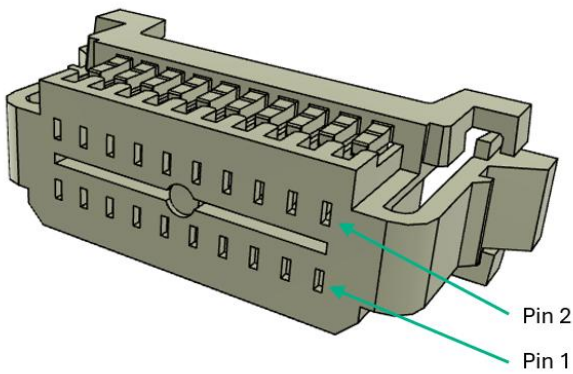


Figure 4 – Gotonomi Module and Multilink RPAS and power connector

The pinout is as follows based on the 586B standard, named from the terminal:

Pin	Terminal Signal Name	Pin	Terminal Signal Name
1	Ethernet_RX_N – Solid Green	2	Do not connect
3	Ethernet_RX_P – Green Stripe	4	Do not connect
5	Ethernet Shield	6	Do not connect
7	Ethernet_TX_N Orange	8	Vin 0v
9	Ethernet_TX_P – Orange Stripe	10	Do not connect
11	Vin 0v	12	Do not connect
13	Vin 18-36v	14	Vin 0v
15		16	
17	Do not connect	18	
19	Do not connect	20	



Figure 5 - Gotonomi Module Connector

Care must be taken when connecting and disconnecting this cable as irreparable internal damage can be caused to the terminal if the connector is forced whilst the pins are misaligned.

4.7.1.2 Satcom uSIM

A 4FF size (nanoSIM) slot is provided. This should only be used with SIM provided by Inmarsat or an Inmarsat distribution partner. The SIM is polarised and can only be inserted in the correct orientation. The SIM card slot can be damaged if a modified 2FF SIM card is used.

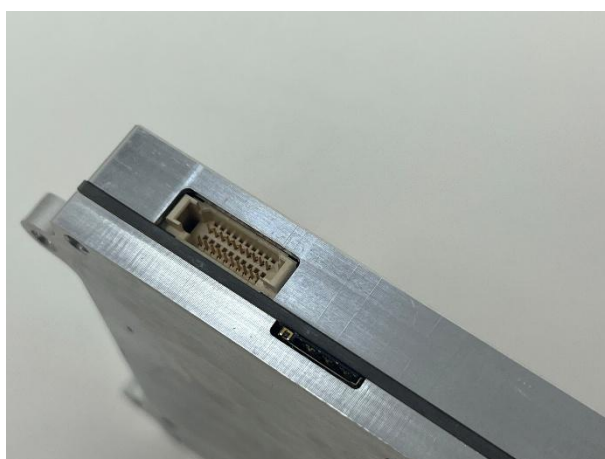


Figure 6 - Gotonomi Module uSIM Slot

4.7.1.3RF

The RF antenna interface is SMPM 50Ω interface. Refer to section 5.3.6 for more information.

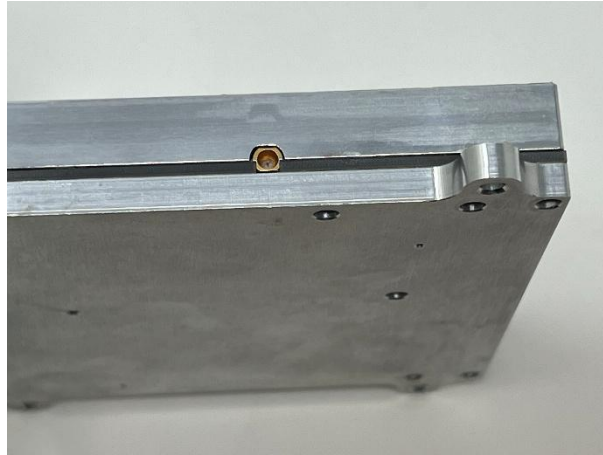


Figure 7 - Gotonomi Module Antenna Connection

4.7.2 Gotonomi Multilink

The Gotonomi Multilink shares the same external connections as the Gotonomi module however it has 2 additional interfaces for the LTE modem.

4.7.2.1LTE uSIM

A 4FF (nanoSIM) slot is provided. This may be used with any appropriate airtime provider. Additional software configuration of the terminal may be required to support individual airtime providers. The SIM is polarised and can only be inserted in the correct orientation. The SIM card and or slot can be damaged if incorrectly orientated.

4.7.2.2LTE RF

Two LTE antenna ports are provided, 1 main antenna port and 1 for a diversity antenna. The connector type is SMPM, any standard LTE antenna is supported.



*Figure 8 - Gotonomi Multilink LTE Antenna ports.
Main antenna connector bottom left, diversity antenna connector closer to the centre*

4.7.3 Gotonomi 200

The Gotonomi 200 has a single IP65 rated standard D-SUB 9 connector. The mating connector is a Molex 173114-0383. The uSIM is not user accessible.

4.7.3.1 Gotonomi 200 RPAS Interface

Pin names based on the 586B standard viewed from the terminal

Pin	Terminal Signal Name	Pin	Terminal Signal Name
1	Ethernet_TX_P – Orange Stripe	6	Vin 18-36v – Blue Stripe
2	Ethernet_TX_N – Solid Orange	7	Solid Blue
3	Ethernet Shield	8	Vin 0v – Brown Stripe
4	Ethernet_RX_P – Solid Green	9	Solid Brown
5	Ethernet_RX_N – Green Stripe		



Figure 9 - V200 Connector

5 Installation

5.1 Process

Whilst there is no standard airframe, use case or installation the following steps should be considered as a minimum:

1	Unpacking of equipment
2	Check-out test of equipment in a lab or controlled environment confirming ethernet connectivity and satellite connection
3	Onboard system integration including control and monitoring of the modem and desired data flow control and routing
4	Mechanical and electrical integration with the airframe
5	Satcom operation following integration
6	Test to ensure other onboard systems are not adversely affected by the satcom
7	Systematic flight trials

5.2 Storage and transport

Temperature: -40 to +70deg C

Humidity: 0 to 95% non-condensing

5.3 Installation guidelines

5.3.1 Safety

Safety guidelines are detailed in section 8.

5.3.2 Mechanical Guide

5.3.2.1 *Gotonomi Module*

Mechanical drawings and 3D STEP files are available for download here: [Gotonomi Module](#)

5.3.2.2 *Gotonomi Multilink*

Mechanical drawings and 3D STEP files are available for download here: [Gotonomi Multilink](#)

5.3.2.3 *Gotonomi 200*

Mechanical drawings and 3D STEP files are available for download here: [Gotonomi 200](#)

5.3.3 Thermal Management

The design of the thermal management is a key part of the integration design and will vary depending on the use case and the environment.

In all cases the thermal management of the terminal must be considered and designed.

The thermal output of the terminal is highly dependent on the uplink data rate. During receive only operation the system produces approximately 4W, at peak upload capacity the system produces approximately 20W.

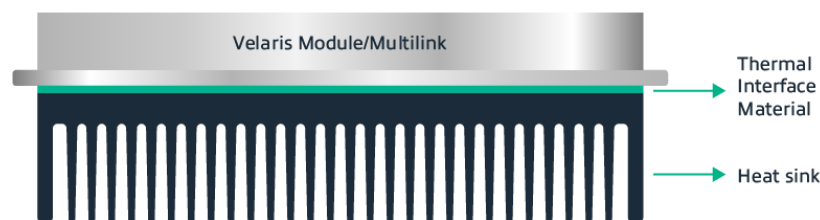


Figure 10 – Gotonomi Module and Mullikink with heatsink

The terminal cannot be damaged by self-induced heating and will enter a protective power down state if the internal temperature reaches 85°C. This status may be queried via the REST API or viewed in the WebUI.

5.3.3.1 Example 1

For evaluation use a Fischer Elektronik SK92-100-SA or equivalent (1K/W) with a suitable thermal interface pad or paste applied is appropriate for mixed use, with 20°C ambient with no radiant heating.

5.3.3.1.1 Example 2

A Gotonomi Module placed inside a fixed wing UAV with trickle airflow, no heatsink, 18°C ambient with limited solar gain. With a data rate of 50kbps maintained a stable operating temperature of approximately 60°C

5.3.4 IP Protection

The Gotonomi Module and Gotonomi Multilink have been designed to IP20 rating. It is recommended that these terminals be installed within an airframe or otherwise protected.

The V200 terminal is designed to IP67 rating. A breathable membrane is fitted to allow for pressure changes.

5.3.5 Power and Ethernet Cable

All terminals use a combined power and data cable. The interface specification is described in section Power supply.

The wiring selected for the power connection should be able to supply 40W with the voltage drop of the cable still meeting the power supply requirements of the terminal.

The ethernet connection utilises 2 twisted pairs (100Base-TX) so an appropriate data cable may be used to reduce weight.

Care must be taken to prevent EMI from the ethernet cables coupling to the power supply cabling, this should be either via screened ethernet cable or physical separation.

Care must be taken to prevent EMI from the antenna from coupling to the power supply cabling, it is recommended to shield the power supply cables in the vicinity of the terminal, to a distance of at least 30 cm.

The grounding scheme adopted for the system will be airframe specific, it is acceptable to treat the housing of the terminal as a system ground. The housing of the terminal is directly connected to the 0v power supply terminal of the external interface.

5.3.5.1 Multilink

The SOM module will thermally protect at 85°C

5.3.6 Antenna and RF Cable

The Gotonomi Module and Gotonomi Multilink terminals require external antennas. The approved antennas are the Gotonomi 200-A Omni and Cobham LGA3000. Please contact Gotonomi about use of alternative antennas.

The terminals are designed and calibrated to be used with an RF cable equivalent to Amphenol 7032-7526 or 7029-3640 . The Gotonomi terminals are designed to be placed within 30cm of the antenna in order to minimise cable loss. Use of a longer cable, or with lower performance than the cable specified may result in poor network performance.

The cable loss between terminal and antenna must be $\leq 0.3\text{dB}$ at 1.6GHz.

5.3.7 Satellite Coverage

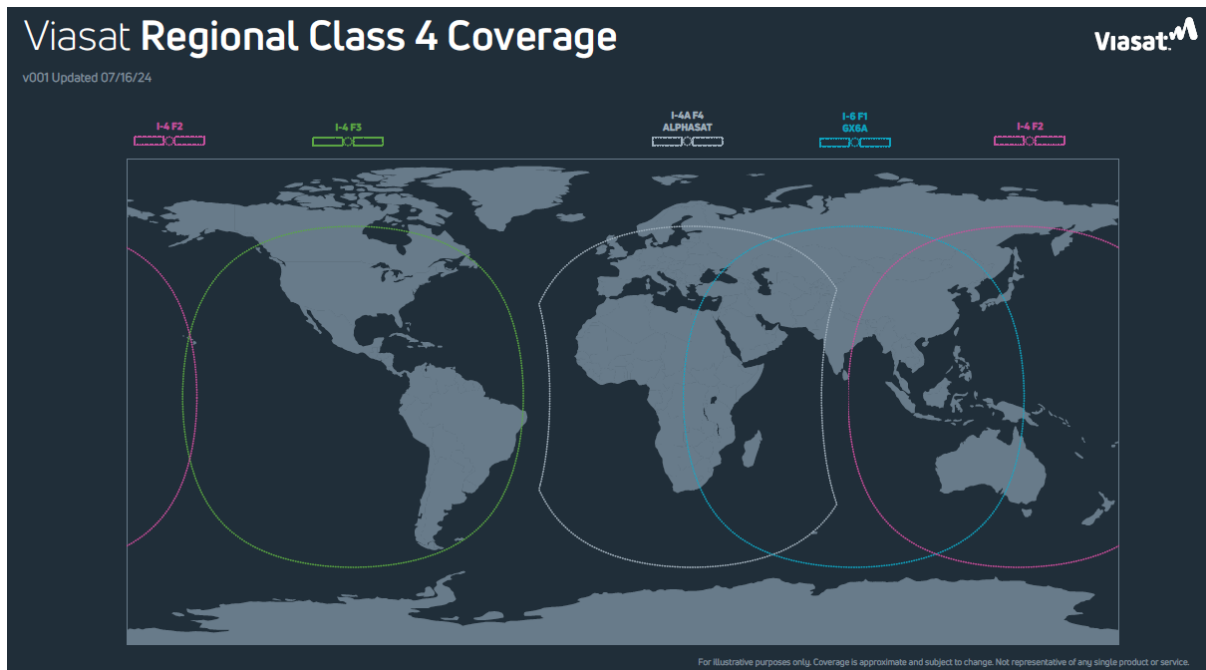


Figure 11 – Viasat Regional Class 4 Coverage map

This map shows the approximate coverage of the different Viasat satellites.

The Gotonomi terminals currently operate as a regional class 4.2 terminal down to an elevation of 20 degrees. Below this elevation terminals will not be able to connect to the network. Terminals which are already connected before they cross this elevation will remain connected as long as the link is maintained, if they disconnect from the network they will not be able to attach again until they have returned to below 20deg elevation.

5.3.8 Satellite Selection

The terminals are designed to switch from one satellite to another as they move across the globe. In areas where more than 1 satellite is available it is possible for the terminal to remain attached to the satellite with the weaker signal if the terminal is in a static location. If you think this is likely to affect you then please contact Gotonomi support for more information.

5.3.9 Antenna positioning

The antenna requires clear line of sight to the satellite. Several online tools² are available which can indicate where the satellite from your current location to the satellite named in Satellite Coverage.

The system is designed for use with omni-directional antennas operating in the open environment. This means that the antenna does not need to be pointed towards the satellite. The antenna must be mounted with the base plate horizontal to the ground during straight and level flight.

² <https://www.groundcontrol.com/us/knowledge/look-angle-calculator/> - Accessed Aug 2024

Buildings or structures can reflect the satellite signal which may interfere with operation of the system. It is recommended that the antenna be at least 20m away from any large structures.

When operating at low elevation, ground structures may also cause reflections and interference.

See Figure 12 – Note that whilst L-Band is unaffected by weather, the multipath reflections may change due to weather conditions which can adversely affect performance if the system is experiencing multipath interference.

This kind of interference may present as:

- Low signal strength
- Highly variable signal strength (working 1 minute, not working the next)
- High CRC error rate
- Poor data rate performance

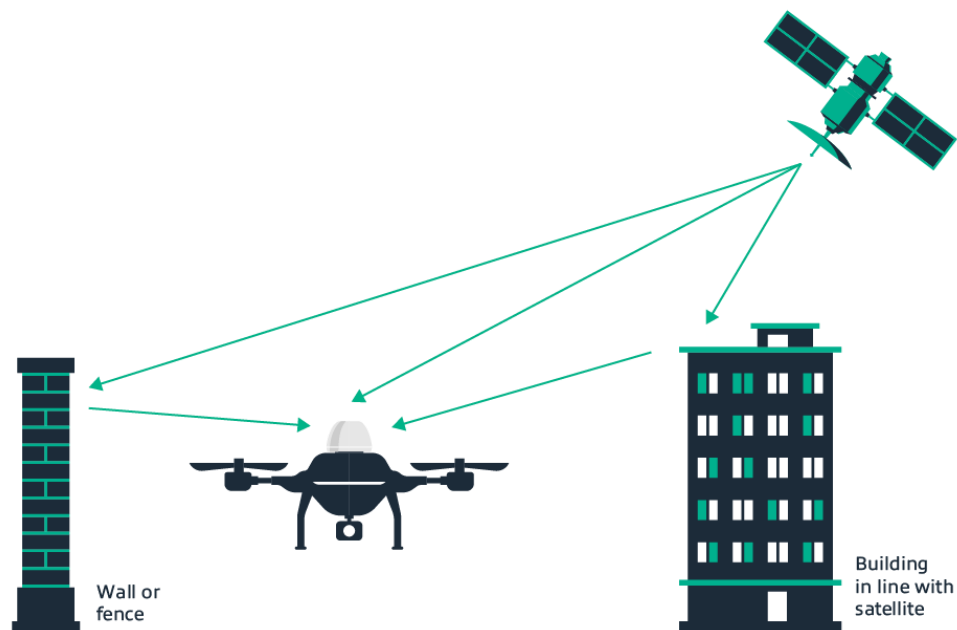


Figure 12 -Examples of multipath interference

Figure 13 shows the positioning of the antenna relative to elements of the airframe. The antenna must have a clear line of sight from the centre of the base of the antenna, at an angle of 20 degrees. For future development it is recommended to have a clear line of sight of 5 degrees.

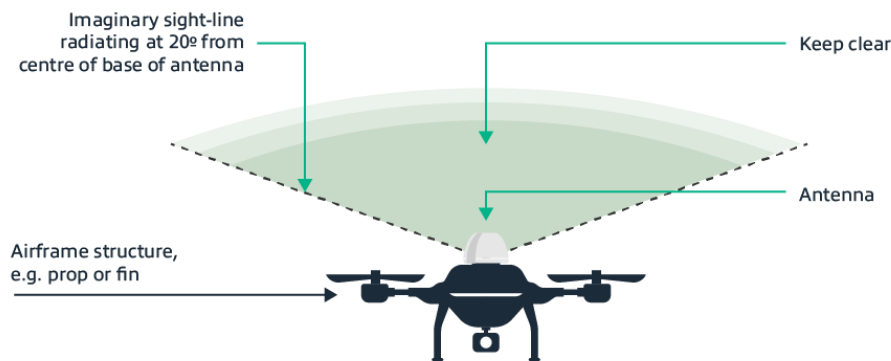


Figure 13 – Example of Airframe blocking

5.3.10 Weather

Signals to/from the satellite are not affected by cloud or rain.

5.3.11 GNSS

All Gotonomi terminals are able to receive GNSS information via the same antenna used for the Satellite communication. This information is available for other use via the REST API. The terminals support reception on the L1 band of GPS and Galileo.

GNSS data may be supplied to the terminal via the REST API from an alternative system.

It is known that L-Band Satellite Communication transmission will cause interference with other GPS receivers. Consideration should be made to locate GNSS receivers away from the Gotonomi antenna, to provide appropriate filtering on the GNSS receiver, or to select a GNSS receiver which incorporates filtering specifically designed to minimise Satcom interference (for example the Ublox NEO-8MN). Antenna placement should be such that the installation can achieve at least 42dB radio frequency isolation between the Gotonomi terminal and GNSS receiver. As a general guideline, GNSS receiver interference can be further minimised if the GNSS receiver antenna is mounted below the level of the Gotonomi antenna. To ensure sufficient isolation is achieved the installer should perform post installation and prior to flight testing, with the satcom and GNSS receiver active, checking that the GNSS receiver continues to operate nominally.

The terminal may be configured to use external GNSS information for certain use cases, please contact Gotonomi for more information.

5.3.12 Power supply

A Power Source Type 2 (PS2) supply should be used – slow blow fuse protected.

Voltage range: 18 – 36v.

The power requirement depends on the usage conditions, these figures are provided for guidance, it is recommended to test the terminals in your intended configuration.

All measurements were made at 20v DC supply

Conditions	5 sec average	Peak Transient
Idle – GNSS search	150mA	150mA
Satcom network attach	200mA	2000mA
Satcom 150kbps transfer	1000mA	1400mA
LTE no Satcom	tbc	tbc
SOM no Satcom, no LTE	tbc	tbc

5.3.12.1 Transient response

The power supply must be capable of coping with the transient power draw of the system. A transient is described as magnitude above with a rise time of <10ms.

As the system employs switch-mode power supplies the currents given are referenced to the supply voltage so may fluctuate depending on the supply voltage.

5.3.12.2

5.3.13 Known sources of Interference

5.3.13.1 USB3

USB3 uses spread-spectrum clocking to reduce the intensity of electromagnetic emissions in its fundamental frequencies. The result is to cause broadband emissions from approximately DC to 10GHz.

USB3 equipment e.g. USB3-Ethernet adaptors added to external devices (Raspberry Pi logger, or RPAS instrumentation etc.) should be appropriately shielded from the satcom antenna.

6 Maintenance

6.1 Servicing

The terminals contain no user-serviceable parts.

The Gotonomi module and Gotonomi multilink are not sealed units, cleaning should be with a clean dry cloth only.

7 User Terminal Operation

7.1 Terminal Interfaces Overview

7.1.1 IP Address

By default the terminals are configured to use the IP address 192.168.1.1 and to act as DHCP servers on their ethernet port. This behaviour is configurable, please consult Gotonomi support pages for instructions.

7.1.2 Certificates Username & Password

The REST and WebUI interface operate over https with basic authentication. The username and password are available from support@gotonomi.com

Note that as the terminal uses a self-signed certificate you will receive a warning from most modern web browsers or command line tools.

7.1.3 REST API Interface

The primary control interface for the terminal is the REST API. An OpenAPI specification for the interface is available. The API can control all aspects of the terminal, from device status and monitoring to connection configuration and management.

7.1.4 AT Command Interface

A legacy AT command interface is supported by the terminal. This is disabled by default but may be enabled by user configuration. Please contact support for instructions.

7.1.5 WebUI Interface

The WebUI is available via any web browser. The default location for this is <https://192.168.1.1>. The WebUI provides support for many basic operations of the terminal such as configuring connection profiles and activating and deactivating connections.

7.1.6 Multilink Interface

The multilink terminal includes a SOM processor and LTE modem

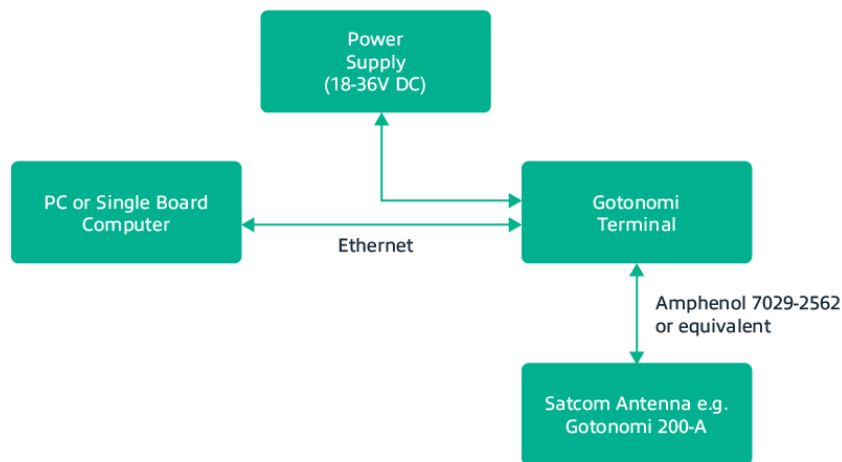


Figure 14 - Gotonomi block diagram

The external ethernet interface connects to the SOM processor. The SOM processor is a Variscite DART-MX8M-MINI.

Specification:

CPU	Quad Core Arm Cortex A53 @ 1.6GHz
Memory	2GB RAM
Storage	16GB eMMC
OS	Yocto Linux

Due to the variety of software configurations available for the SOM processor it is not possible to detail them here, please seek advice from support on both supported commercial offerings and/or customer development options.

7.2 WebUI

The WebUI is available on the IP address of the terminal, by default this would be <https://192.168.1.1>

Note: If using a Multilink then the WebUI is accessible as it is routed via the SOM ethernet interface to make getting started easier. Certain configuration does not work in the same way as the Gotonomi module or V200, you are advised to contact support@gotonomi.com.

7.2.1 Dashboard

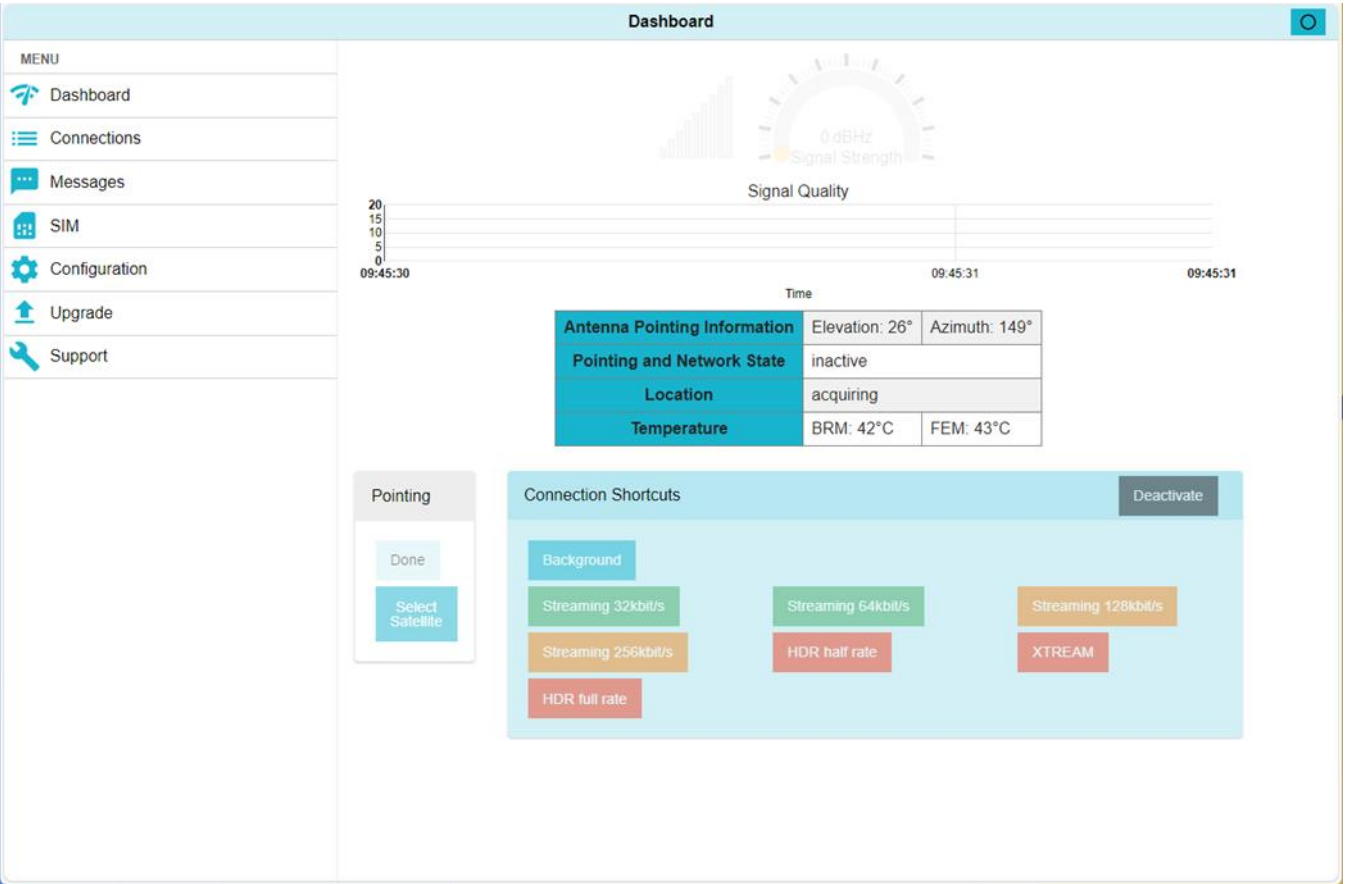


Figure 15 - WebUI

The central blue box provides critical information regarding the status of the terminal:

Entry	Description
Location	The Gotonomi terminal cannot connect to the BGAN network without a valid GPS fix. This entry will progress from: acquiring, to valid fix and finally display a longitude and latitude
Pointing and Network State	This entry will start at detached and (once a valid fix is achieved) progress to ready (detached) and then ready + attached
Antenna pointing information	The Gotonomi terminals currently only support operation where the elevation of the satellite is greater than 20 degrees. If the elevation falls below this it is likely that the network will not permit attachment
Temperature	The temperature of the FEM must remain below 85 degrees. If this temperature is exceeded the terminal will shut down the satcom link until the temperature has fallen

Note that the connection shortcuts links on the main dashboard are not valid for the Gotonomi terminals and will be removed in a future FW update

7.2.2 Connections

The connections tab allows the configuration and activation of different PDP contexts

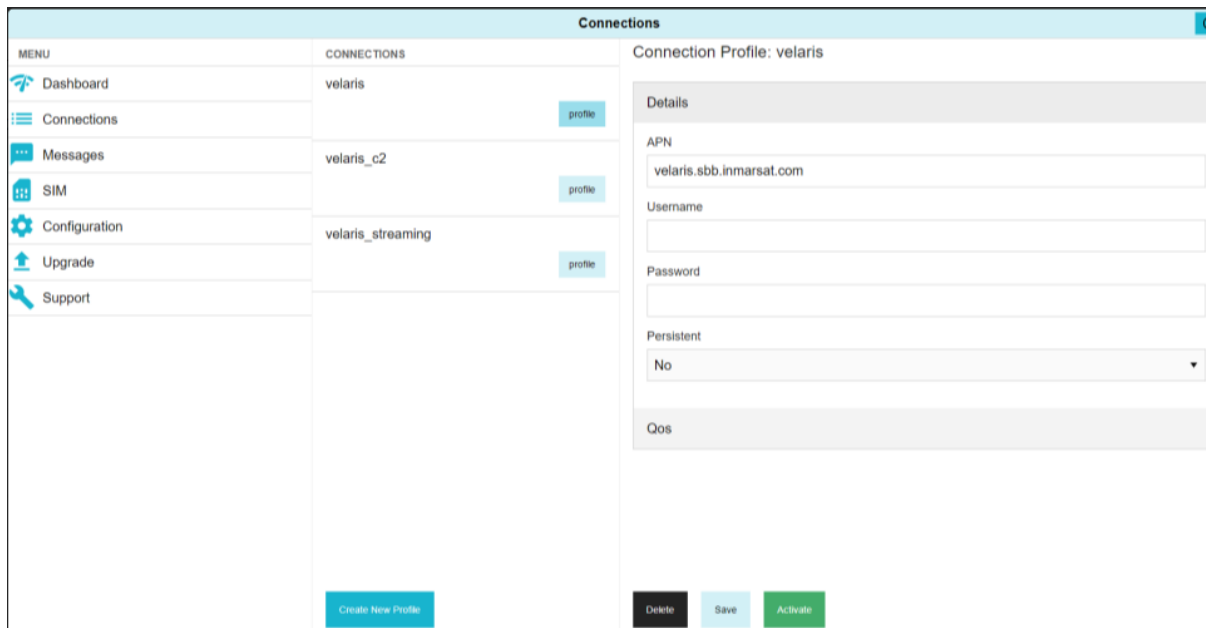


Figure 16 - Connections interface

Clicking on a profile will allow modification of the configuration and/or activation of it

Setting a profile to persistent will cause the terminal to activate this connection each time the terminal connects to the network.

The QoS settings are a request to the network for a particular quality of service, once the link has been established the QoS section will be marked “negotiated” and will show the QoS agreed with the network.

Note: a streaming connection incurs per-minute charges

7.2.3 Upgrade

The upgrade tab allows for firmware updates to the modem by dragging and dropping files provided.

7.3 Satellite Data Link

7.3.1 Data rate

The system provides maximum background connection data rates of 200kbps up and down however this is not guaranteed bandwidth and depends both on signal strength and network loading. Streaming data connections up to 32kbps are supported which provide guaranteed bandwidth. Streaming connections at 8 and 16kbps are also supported.

7.3.2 APN

By default 3 different satcom connection profiles are configured:

Connection Name	APN / Configuration	Description
velaris	velaris.sbb.inmarsat.com	Background data connection
velaris_c2	velaris.c2.sbb.inmarsat.com	Prioritised background data connection for C2 data – please note this is not currently implemented
velaris_streaming	velaris.stream.sbb.inmarsat.com	Streaming enabled data connection at 8, 16 or 32kbps

The username and password present for each connection profile are synchronised with the SIM card. Each username and password is specific for the APN and cannot be used multiple times simultaneously. Please contact support@gotonomi.com if you require more active PDP contexts to each APN.

If a connection is activated then the terminal will route all traffic via that connection.

7.3.3 PPPoE

The Gotonomi terminals can support up to 10 simultaneous PDP contexts. A host system can establish a PPPoE connection to the modem. The PPPoE connection must specify one of the APN's. Instructions are available for Windows and Linux from support@gotonomi.com.

Once a PPPoE connection is established the modem will no longer route traffic via a normally activated context, it would therefore be required for the host system to do that if needed.

PPPoE connections will only succeed if the terminal is able to activate the network connection, therefore it will not work until the terminal is attached to the network.

7.4 Data rate control

Due to the nature of operation of these terminals it is likely that the available bandwidth will fluctuate whether this is due to the capacity of background data or due to the antenna being turned away from the satellite during a banking manoeuvre.

During these periods the network acts as a store and forwards system, with both the terminal and the ground station buffering data until the link returns. During this and immediately after, until the backlog has been cleared, it is likely that the user will experience an increase in latency, not due to an increase in the link itself but as data has to queue before it can be transferred. Users should be mindful that the capacity of the link can fluctuate and the closer to operating at link maximum the terminal is the longer it will take to return to normal operation. If the latency is too high then certain user applications running over the satcom link may start to fail.

Note: Windows in its default configuration will place a lot of traffic on the connection which can both affect testing and/or create large data bills.

8 Safety information

8.1 Introduction

All variants of the velaris product are considered system components. There are certain requirements for system integration which were assumed during the terminal safety assessment. These requirements are described in this section.

8.2 Outside use

The terminal must only be used within a structure or self-contained system such as a UAV. The terminal must not be connected to infrastructure cabling without appropriate protection for the terminal from external circuit transients.

If the terminal is attached to a building or building structure then the maximum height above ground for which the unit has been assessed is 2m.

8.3 Power supply

The power supply of the terminal must be of type PS2. This requires that the power supply is limited to not exceed 100W after 5 seconds.

8.4 RF Safety

When the antenna is operational an operator should maintain a distance from the antenna radome of at least 55cm. Note that there is no requirement below the horizon of the antenna.

8.5 Thermal safety

The integrator is responsible for providing sufficient heat sinking to limit the internal and external temperatures of the terminal. With no thermal management, under non fault high throughput conditions the surface temperature of the terminal may reach 85 degrees. Appropriate warnings and access controls should be appropriate to the installation situation.

9 Regulatory

9.1 Regulatory declaration information

9.1.1 Frequency use

Parameter	Value
Terminal TX frequency	1626.5 to 1660.5MHz 1668 to 1675MHz
Terminal RX frequency	1518 to 1559MHz
GNSS frequency (receive)	1559 to 1610MHz

9.2 Country Safety Certificates

Contact support@gotonomi.com for further information.

9.3 Regulatory Declaration

Changes or modifications not expressly approved by Gotonomi/TTP Plc could void the user's authority to operate the equipment

9.3.1 Velaris Module

FCC Supplier's Declaration of Conformity

Gotonomi Module VM01

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Designated U.S. Agent

- Company Name: Approve-IT, Inc.
- Contact Name: Nathan Grinager
- Street Address: 8011 34th Ave South, Suite 342
- City/Province/Zip: Bloomington, MN 55425
- Telephone No: 651-247-1678
- Email: team@approve-it.net
- FRN #: 0027533835

To ensure compliance with FCC and ISED RF exposure requirements this device must be installed to provide a minimum of 55cm between the antennas and people.

Pour garantir la conformité aux exigences d'exposition RF de la FCC et d'ISED Canada, cet appareil doit être installé de manière à laisser un minimum de 55 cm entre l'antenne et les personnes.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This radio transmitter 33922-VMODULE200A has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Cet émetteur radio 33922-VMODULE200A a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antennes énumérés ci-dessous, avec le gain maximal autorisé indiqué. Les types d'antennes non inclus dans cette liste et dont le gain est supérieur au gain maximal indiqué pour l'un des types énumérés sont strictement interdits avec cet appareil.

Gotonomi Omni 200A Antenna, Gain 2.5dbi, Impedance 50 Ohm

9.3.2 Velaris Multilink Module

FCC Supplier's Declaration of Conformity

Gotonomi Multilink Module VML01

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Designated U.S. Agent

- Company Name: Approve-IT, Inc.
- Contact Name: Nathan Grinager
- Street Address: 8011 34th Ave South, Suite 342
- City/Province/Zip: Bloomington, MN 55425
- Telephone No: 651-247-1678
- Email: team@approve-it.net
- FRN #: 0027533835

To ensure compliance with FCC and ISED RF exposure requirements this device must be installed to provide a minimum of 55cm between the antennas and people.

Pour garantir la conformité aux exigences d'exposition RF de la FCC et d'ISED Canada, cet appareil doit être installé de manière à laisser un minimum de 55 cm entre l'antenne et les personnes.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This radio transmitter 33922-VMULTIL200A has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Cet émetteur radio 33922-VMULTIL200A a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antennes énumérés ci-dessous, avec le gain maximal autorisé indiqué. Les types d'antennes non inclus dans cette liste et dont le gain est supérieur au gain maximal indiqué pour l'un des types énumérés sont strictement interdits avec cet appareil.

Gotonomi Omni 200A Antenna, Gain 2.5dbi, Impedance 50 Ohm

9.3.3 Velaris 200

FCC Supplier's Declaration of Conformity

Gotonomi Module V200

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Designated U.S. Agent

- Company Name: Approve-IT, Inc.
- Contact Name: Nathan Grinager
- Street Address: 8011 34th Ave South, Suite 342
- City/Province/Zip: Bloomington, MN 55425
- Telephone No: 651-247-1678
- Email: team@approve-it.net
- FRN #: 0027533835

To ensure compliance with FCC and ISED RF exposure requirements the V200 device must be installed to provide a minimum of 55cm between the device and people.

Pour garantir la conformité aux exigences d'exposition RF de la FCC et d'ISED Canada, cet V200 appareil doit être installé de manière à laisser un minimum de 55 cm entre l'appareil et les personnes.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to

radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

9.4 Type Approval

The Gotonomi Terminals are type approved for the Viasat network.
Contact support@gotonomi.com for further information.

9.5 Export control

Each of the 3 Gotonomi terminals have undergone rating by the UK government. They have advised that the terminals are covered by the Dual Use designation, rating 5A101. Users should ensure that they comply with all appropriate laws and regulations.

10Document Version History

Version	Release Date	Comments
2.1	May 2025	Added regulatory info, safety section and FCC agent’s details.
1.1	March 2025	Added altitude restrictions
1.0	21 Jan 2025	Initial release