MINFARM Satellite

MF GATEWAY

Outdoor LoRaWAN® Satellite Gateway with Solar Power and Battery Backup

MF GATEWAY Features

- **Global Connectivity:** For a large number of LoRaWAN® sensors within 10 km 'hotspot' range of MF GATEWAY with uplink and downlink reachback via small L-band satellite terminal to corporate HQ
- **Outdoor and Solar Powered with Battery Backup:** IP66 outdoor unit with fully autonomous solar powered system and battery backup
- **Modular Solar System:** The MF GATEWAY is designed around an MPPT solar charge controller which allows the solar panel to operate at its maximum power point. Multiple solar panels can be easily attached to the enclosure which allows the same enclosure to be deployed to different locations with different peak sun hour patterns.
- **Easy to Integrate:** Works with any LoRaWAN® sensor and endpoint, including AWS and The Things Network with onboarding Dashboard and fully documented API
- **Secure:** Defence in depth architecture with end to end encryption and private hosting options available
- **Globally Certified:** L-band satellite certification and radio emissions certification for deployment to the Middle East (UAE, Oman, KSA), North America, Africa, Europe, Brazil, Australia, New Zealand
- **ATEX Version Available:** For use in hazardous areas

minfarmtech.com

Viasat ELEVATE Partner

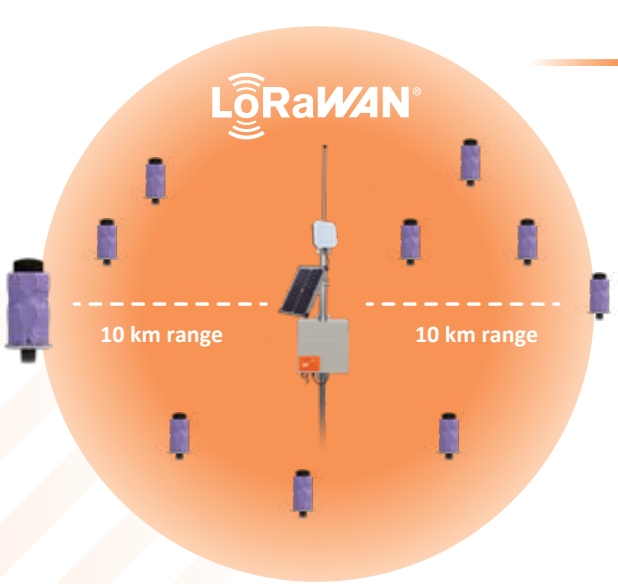
MF GATEWAY

MF GATEWAY Overview

The MF GATEWAY Outdoor Solar unit provides LoRaWAN® sensor connectivity in remote locations where data or power are not available. A LoRaWAN® 'hotspot' with a 10 km radius from the MF GATEWAY provides a low power wide area network to field devices. The MF GATEWAY uses L-band geostationary satellite services via a low power satellite terminal. The MF GATEWAY transmits gathered field sensor data uplinks to a corporate HQ location via its L-band satellite data connection. This satellite data connection supports command downlinks and has 24/7 global availability. The MF GATEWAY's satellite data usage is predictable and reliable using MinFarm's protocol optimization and compression. The MF GATEWAY's end to end encryption module and defence in depth architecture ensures all data is transferred in a secure manner. The MF GATEWAY is an outdoor unit with autonomous solar power and battery backup, suitable for year-round deployments in remote locations. Remote telemetry and firmware update management is available via a fully documented API.

MF GATEWAY LoRaWAN® with Satellite Connectivity

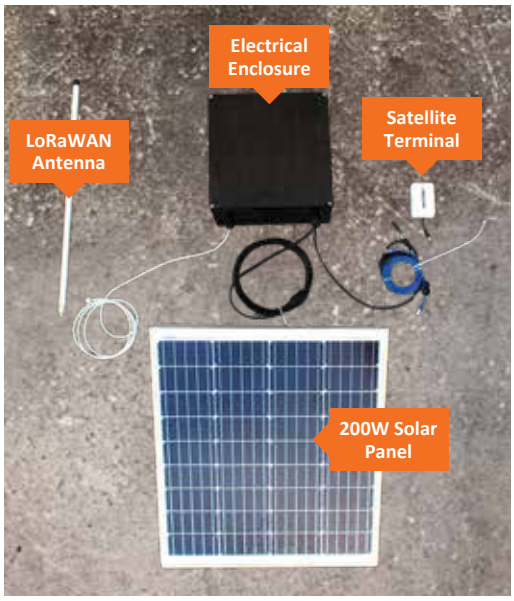
The MF GATEWAY has global 24/7 uplink and downlink data coverage via the Viasat L-band geostationary satellite service. Local sensors communicate using the LoRaWAN® protocol within a 10 km range of each MF GATEWAY Outdoor Solar unit. Several thousand sensors can be supported by each MF GATEWAY. Overlapping coverage zones can provide wide geographic coverage with sensor data connectivity. The MF GATEWAY is available in an ATEX zone 2 variant for deployment in hazardous zones.



Index	11603
Timestamp (YYYY-MM-DDThh:mm:ss:mmmZ)	2022-01-26T16:03:37.000Z
Data	0.1430
Temperature(C)	22
Status	BAT OK | PRESSURE DEVICE | NO ERROR
Reserved	5
Reboot counter	181

MF GATEWAY

MF GATEWAY Components and Assembly



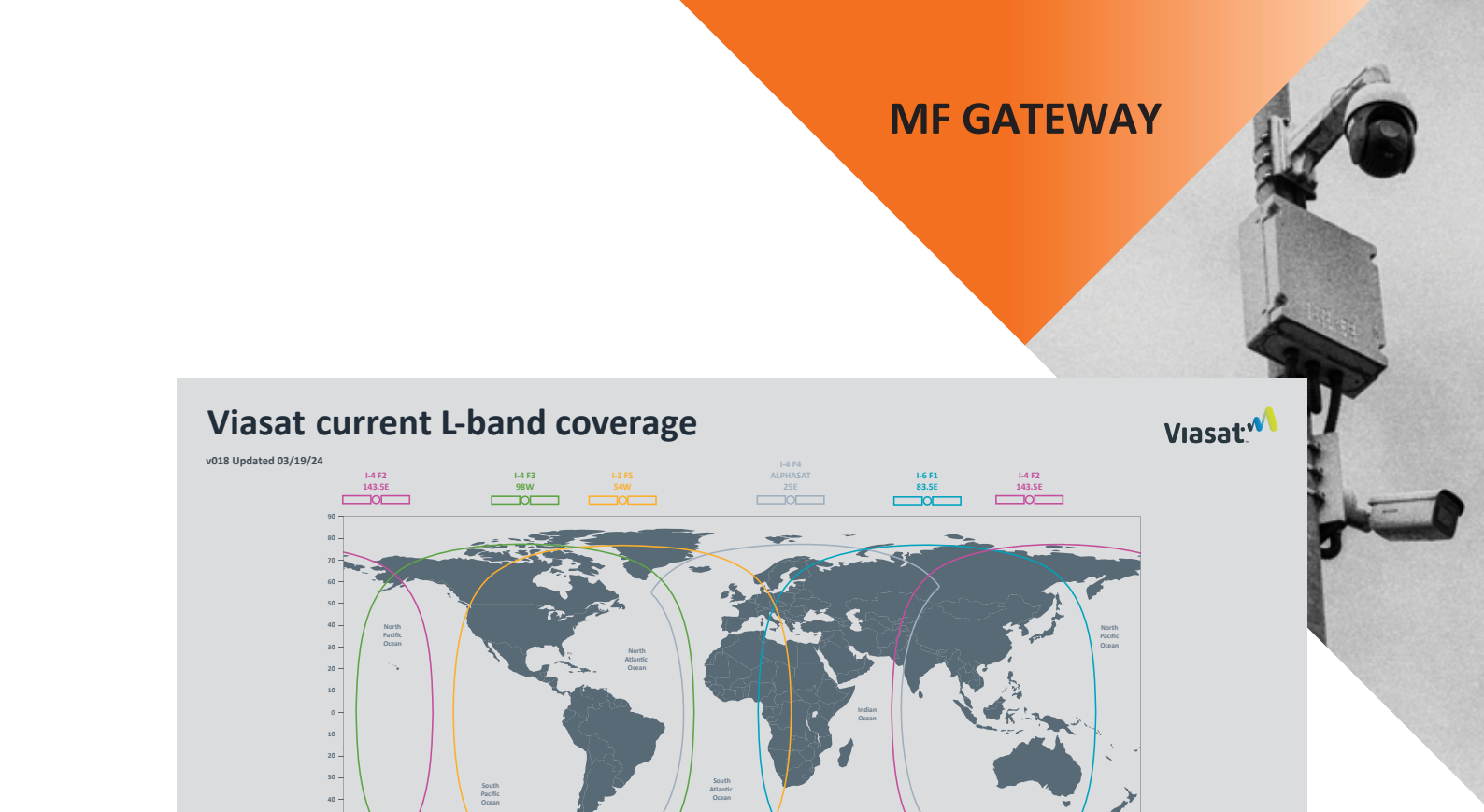
MF GATEWAY Satellite Service Overview

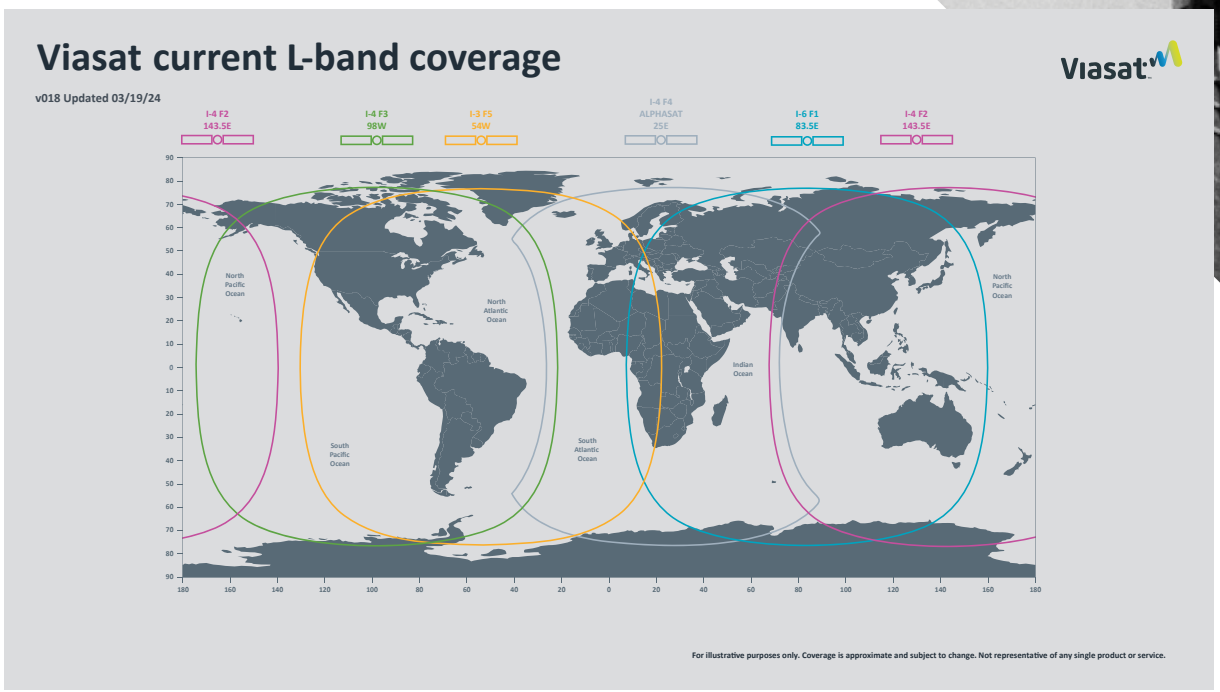
MF GATEWAY Satellite connectivity is provided by the L-band IsatData Pro (IDP) or BGAN satellite service owned and operated by Viasat Inc. The IDP service supports smaller, low power terminals that are suitable for sensor deployments of less than 100 sensors transmitting uplinks every hour. Larger sensor deployments should use the BGAN service. Viasat owns and operates L-band satellites in geostationary orbit that provide global coverage and capacity today to over 300,000 L-band devices in mission critical infrastructure monitoring roles all over the world. It is a trusted service utilised by governments, industry and NGOs for asset monitoring and real time information gathering. L-band is an extremely robust and weatherproof frequency that requires relatively low power satellite terminals that can operate in temperatures of up to 85°C. Country specific satellite licences for L-band terminal usage are held by MinFarm's existing distribution partner network.

Modular Solar System

The MF GATEWAY is designed around an MPPT solar charge controller which allows the solar panel to operate at its maximum power point. Multiple solar panels can be easily attached to the enclosure which allows the same enclosure to be deployed to different locations with different peak sun hour patterns. The only variable is the number and size of solar panels required by the location. This simplifies deployment and logistics. The unit is also field upgradeable. A field technician can add extra solar panels without any change or reconfiguration required to the enclosure itself.

MF GATEWAY





MF GATEWAY Model Ordering Information

Model Name	Product Description
MF-460	MinFarm Gateway with Solar and Battery Backup for BGAN Satellite Terminals and LoRa EU868 Networks
MF-460-915	MinFarm Gateway with Solar and Battery Backup for BGAN Satellite Terminals and LoRa US915 Networks
MF-460-SERIAL	MinFarm Gateway with Solar and Battery Backup for IDP Satellite Terminals and LoRa EU868 Networks
MF-460-SERIAL-915	MinFarm Gateway with Solar and Battery Backup for IDP Satellite Terminals and LoRa US915 Networks
MF-460-SERIAL-ATEX	MinFarm Gateway with Solar and Battery Backup for IDP Satellite Terminals and LoRa EU868 Networks with ATEX certification

MF GATEWAY Certifications and Standards

Electrical Enclosure

EMC	MF Edge Gateway (Europe): CE Mark (EU) RED (EU) UKCA (UK) EN 55032:2012/AC:2013 (Emissions) MF Edge Gateway (US): FCC Part 15 Class A MF Edge Gateway (Canada): ICES-003 Class A MF Edge Gateway (Australia): Australia: CISPR32 MF Edge Gateway (Japan): Japan: TELEC, Radio/Telecom Biz Act, GITEKI Smart Shunt: EN-IEC 61000-6-1 EN-IEC 61000-6-2 Solar Charge Controller: EN 61000-6-1 EN 61000-6-3 ISO 7637-2 LFP Battery: EN-IEC 61000-6-3:2007 A1:2011 AC:2012 EN-IEC 61000-6-2:2005 AC:2005
Safety Compliance	Electrical Enclosure: Flammability UL 94 - V-0 Glow wire test - IEC 60707-3: 960°C; 3.2 mm RoHs - Directive 2011/65/EU CE-Label - EG-No. 765/2008 Low Voltage Directive No.: 2014/35/EU UL508A / C22.2 - Typ 1, 4, 4x Halogen free Digital Timer: Protection Class: II according to EN 60 730-1 MF Edge Gateway (Europe): IEC 60950-1 MF Edge Gateway (North America): UL/cUL 60950-1 UL/cUL 62368-1 MF Edge Gateway (Australia): IEC 60950-1 IEC 62368-1 MF Edge Gateway (Japan): UL 60950-1 2nd Ed. cUL 60950-1 2nd Ed. IEC 60950-1 2nd Ed LFP Battery: EN-IEC 62368-1:2020 IEC 61427-1:2013 NEN-EN-ISO 9001:2015

MF GATEWAY

MF GATEWAY Certifications and Standards

Electrical Enclosure

Radio Compliance	MF Edge Gateway (Europe): RED, Article 3.1b: EN 301 489-1 V2.1.1 (General) EN 301 489-1 V2.2.3 (General) EN 301 489-3 V2.1.2 (LoRa/SRD) EN 301 489-17 V3.2.0 (WiFi/BT) EN 301 489-19 V2.2.0 (GNSS receivers) RED, Article 3.2: EN 303 413 V1.1.1 (GNSS) EN 300 220-2 V3.1.1 EN 300 220-2 V3.2.1 (Lora/ISM) EN 300 328 V2.2.2 (2.4 GHz ISM) EN 301 893 V2.1.1 (5 GHz RLAN) MPE/RF Exposure: EN 62311:2008 MF Edge Gateway (US): FCC Part 22, 24, 27 MF Edge Gateway (Canada): ISED-003 MF Edge Gateway (Australia & New Zealand): AS/NZS 4268:2012 + A1:2013 MPE Standard 2014 MF Edge Gateway (Japan): Japan Giteki, Radio/Telecom Biz Act
Weight	9 kg (without battery)
Dimensions (L x W x D)	405 x 405 x 200 mm
Operating Temperature	-30 to +50°C
Humidity	20% - 90% RH, non-condensing
IP Rating	IP66

Battery

EMC	EMC Directive 2014/30/EU with the following harmonised standards: EN-IEC 61000-6-3:2007 A1:2011 AC:2012 EN-IEC 61000-6-2:2005 AC:2005
Safety Compliance	Low Voltage Directive 2014/35/EU with the following harmonised standards: EN-IEC 62368-1:2020 Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 1: Photovoltaic off-grid application: IEC 61427-1:2013
Nominal Capacity at 25°C	60 Ah
Nominal Voltage	12 V
Chemistry	LiFePO4
Safety Compliance	The integrated Battery Management System (BMS) will disconnect the battery in case of over discharge, over charge, low or high temperature
Weight	9.5 kg
Dimensions (L x W x D)	213 x 229 x 138 mm
Operating Temperature	Discharge: -20 to +50°C Charge: 0 to +45°C
Storage Temperature	-40 to +65°C
Transport Information	UN3480 - UN3481

MF GATEWAY

MF GATEWAY Certifications and Standards

BGAN Satellite Terminal

Certification	Regulatory: CE, FCC, IC Inmarsat: Inmarsat Class 2 Type Approved and BGAN M2M Certified
Safety Compliance	Hazardous Environments: C1D2 Certified
Weight	1.6 kg
Dimensions (L x W x D)	202 x 202 x 51.8 mm
Operating Temperature	-40 to +55°C
Humidity	95% non-condensing at 40°C/+104°F
IP Rating	IP66

IsatData Pro (IDP) ST 2100 Satellite Terminal

Certification	Regulatory: CE, FCC, IC, Anatel Inmarsat: Inmarsat Type Approval
Safety Compliance	Vibration: SAE J1455 (Sec 4.9.4.2 fig 6-8) MIL-STD-810G (Sec 514.6, 514.6C-1) Shock: MIL-STD-810G (Sec 516.6)
Weight	200 g
Dimensions (L x W x D)	125 x 85 x 36 mm
Operating Temperature	-40 to +85°C
IP Rating	IP67

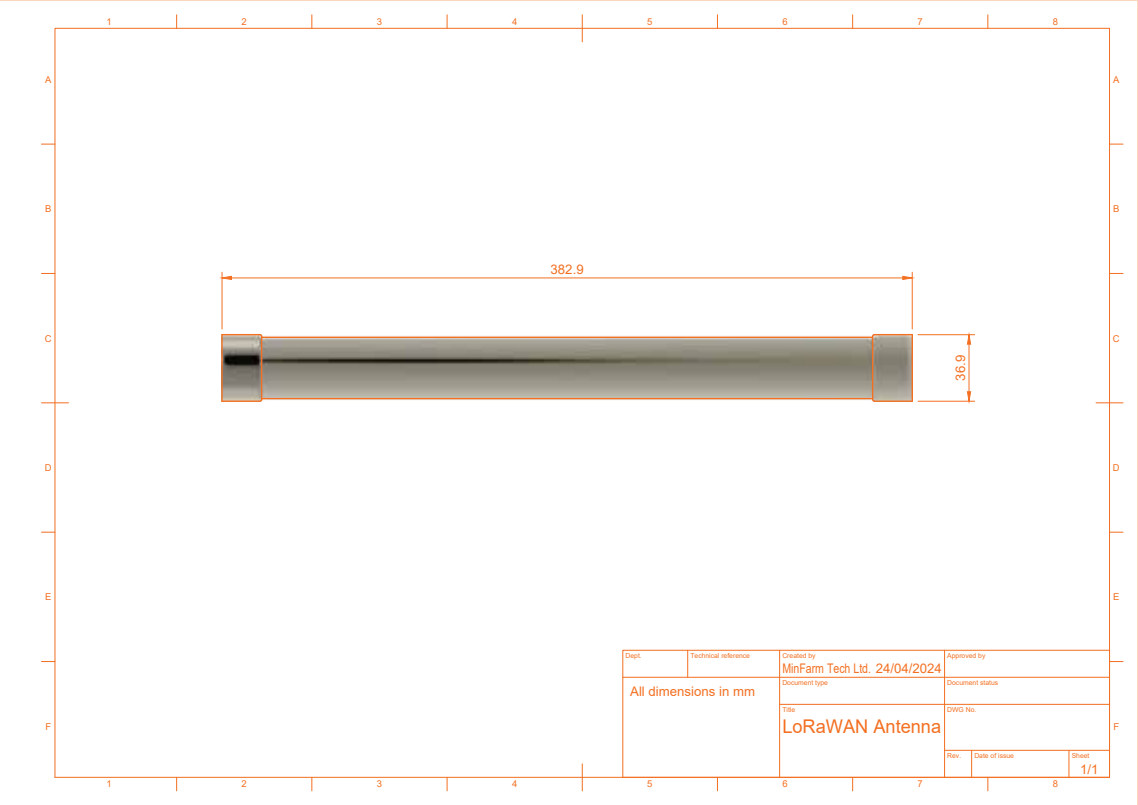
Solar Panel

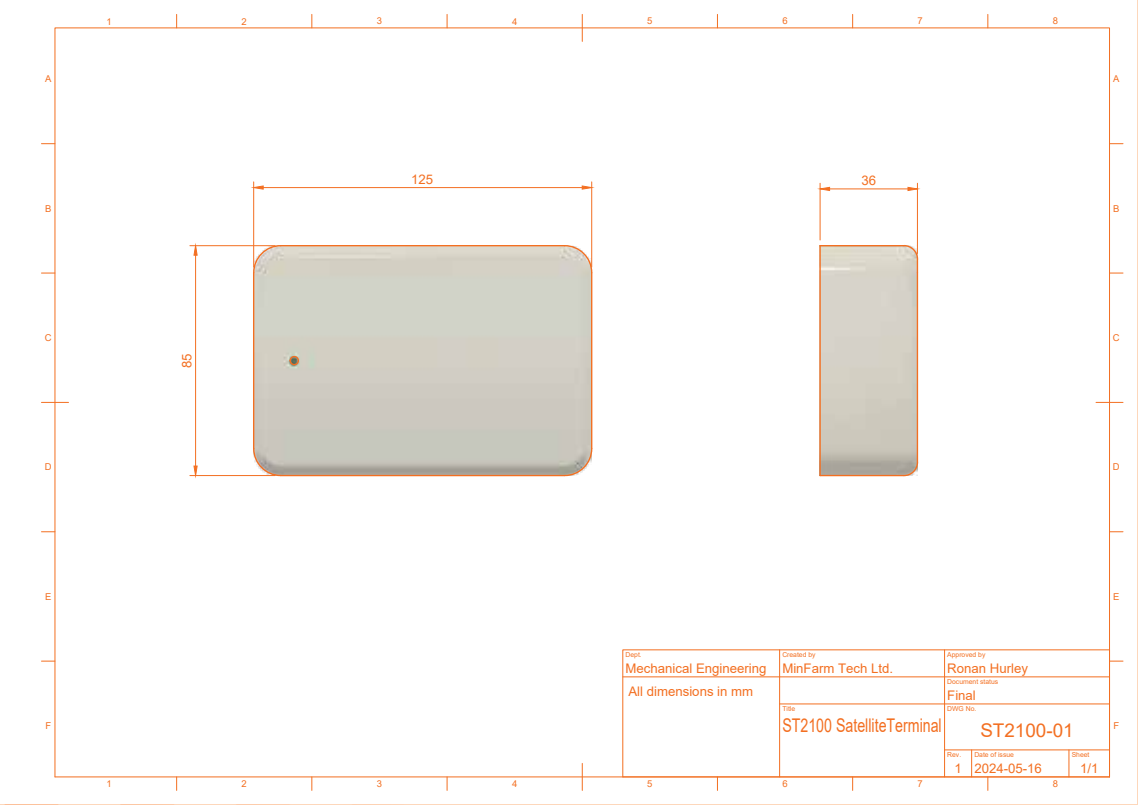
Power	200 W
Safety Compliance	CE RoHs
Weight	11.5 kg
Dimensions (L x W x D)	1482 x 674 x 35 mm
Operating Temperature	-40 to +85°C
IP Rating	IP65

LoRa Antenna

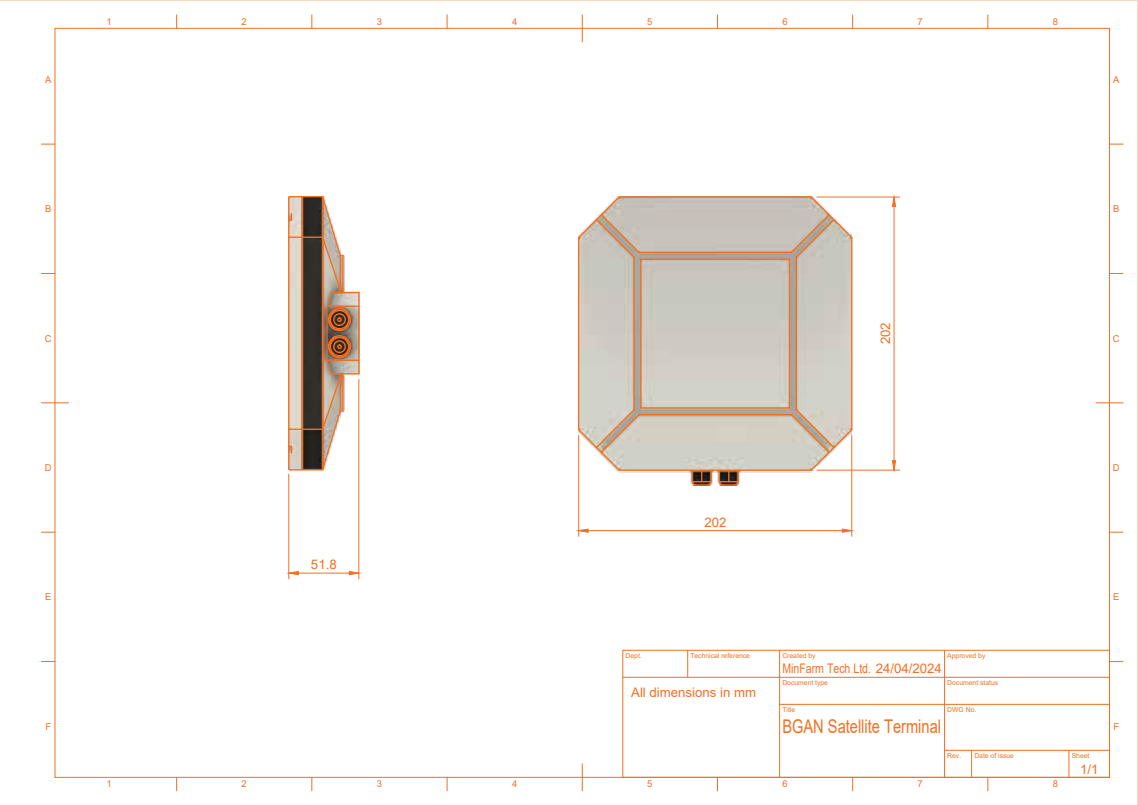
Safety Compliance	Flammability Rating: UL94 HB
Weight	0.228 kg
Dimensions (L x Diameter)	338.9 x 36.9 mm
Operating Temperature	-40 to +85°C
Humidity	100%
IP Rating	IP67

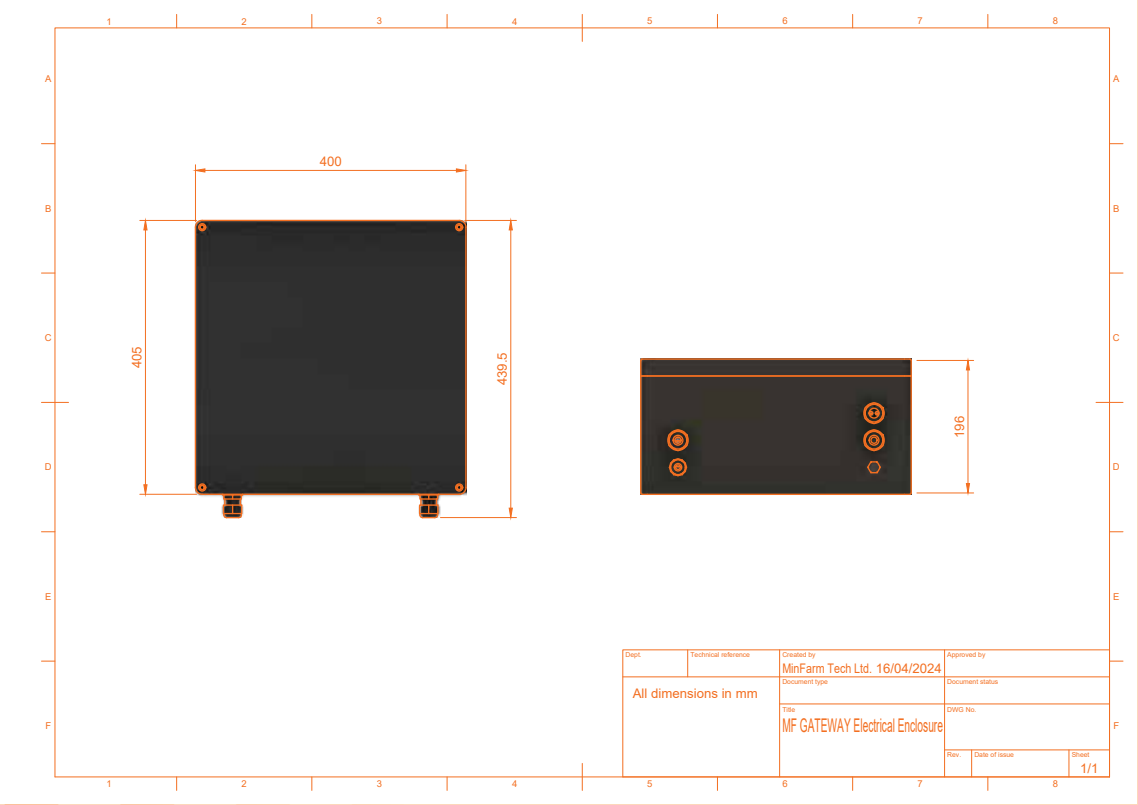
MF GATEWAY Outdoor Solar Technical Drawings



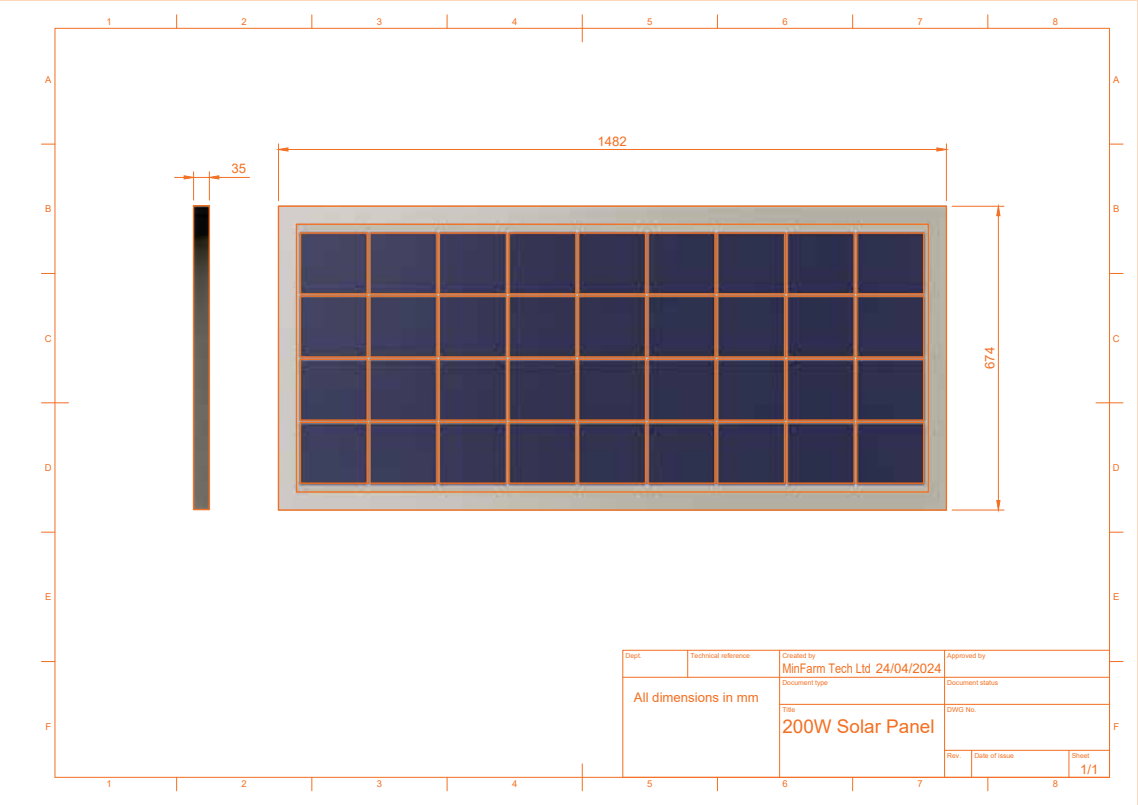


MF GATEWAY Outdoor Solar Technical Drawings





MF GATEWAY Outdoor Solar Technical Drawings



MINFARM
Satellite

Contact Info

Email: sales@minfarmtech.com

Web: minfarmtech.com

Tel: +353 1 442 8574

Postal address: MinFarm Tech Ltd.

Bracetown Business Park, Clonee

Co. Meath, Ireland

minfarmtech.com