SOLUTION READY

Aptella
AUTOMATION + POSITIONING TECH

Quick Start Guide and Trouble Shooting Essentials

AllDayRTK Network Plug & Play Base

October 2025

All Day RTK
Enabling Geo-Precision

AllDayRTK

Enabling Geo-Precision

POWERED BY Aptella AUTOMATION + POSITIONING TECH

Contents

Technical

Introduction

The AllDayRTK team have developed a new modular network base station concept called Plug-n-Play (P&P). Designed to be robust, reliable, professional build quality, high accuracy positioning solution.

With a choice of GNSS and telecommunication components such as being Starlink ready, the P&P base kit is future-proof and technically agile.

Managed remotely through the AllDayRTK platform to maximise uptime and signal availability; just plug it in and let our team do the rest!

Features

- Agile high accuracy AllDayRTK Focus network base solution
- Future-proof GNSS hardware with multi-GNSS support
- Dual SIM 4G LTE communications and Starlink ready
- Professional build, robust and reliable design
- Precise survey coordination and monitoring
- Full remote operations and management
- Durable intuitive external connections
- Secure user access and activity reporting
- AllDayRTK platform management tools
- Direct level 1 support

Quick Start Guide – Plug it in and AllDayRTK does the rest!

POWERED BY Aptella AUTOMATION + POSITIONING TECH

System Overview

- Pre-configured to connect GNSS base to AllDayRTK Network on power up
- Base Kit Includes :

  Topcon MR2 GNSS receiver, Cradlepoint S700 modem, GNSS antenna, power supply, cable management and enclosure.

Components

- **Topcon MR-2 multi-GNSS reference receiver**
- **Cradlepoint S700 Modem** (Dual SIM, Starlink/NBN ready)
- **Topcon G5-A1 GNSS Antenna** (IGS Calibration)
- **Victron Energy 240V AC to 12V DC Power Supply** (Double insulated)
- **30m LMR400 GNSS Antenna Cable**
- **2x 4G External Paddle Antennas**
- **Serial to USB-A and USB-C Cables**
- **Enclosure Box** (pre-wired and tested)

Additional Accessories Required:

- GNSS Antenna Mounting Pole (Tripod brackets for metal roof or wall mount pole)

Optional Accessories:

- External 4G Antenna extension set – optional kit can be purchased if an external 4G antenna extension is required to improve 4G signal reception.

Plug and Play Kit - Internal

AllDayRTK
Enabling Geo-Precision

Quick Start Guide – Plug it in and AllDayRTK does the rest!

POWERED BY Aptella AUTOMATION + POSITIONING TECH

Install and Power up

• Pre-configured to connect GNSS base to AllDayRTK Network on power up

1. Mount the G5-A1 antenna securely and level on the desired stable structure using the appropriate antenna mounting set, such as Tripod roof mount or Wall mount pole. (Refer to Detailed Installation Guidelines) Note Antenna serial number required for Reg13 Meta data

2. Plug the TNC end of the LMR400 GNSS antenna cable into the G5-A1 antenna and route the cable securely from the roof to the desired location within the building where the Enclosure is placed.

Safety Notice: care must be taken to abide by all requirements set by building owner, this includes cable routing, use of conduit, and waterproofing and roof cavities that have been made for routing the cable.

3. Connect the N-type end of the LMR400 cable into GPS Port of the enclosure.
4. Connect the 2x 4G Paddle Antennas into CELL1 and CELL2 ports of the enclosure
NOTE#1 : If there is an external 4G antenna fitted on the roof, plug the external 4G antenna cable into the CELL1 port using the SAE to N adaptor from one of the 4G paddle antennas.
NOTE#2: If there is NBN or Starlink internet available on site, and if the host wishes to run the Base station using their internet, plug the NBN/Starlink router into the Ethernet port of the enclosure using a standard Ethernet cable (Ethernet cables are not provided with Plug-n-Play Base Kit)

5. Plug the Anderson power connector end of the Victron Energy Battery Charger / power supply into the Anderson port of the Enclosure and plug the Battery charger into a standard certified 240V AC wall socket.

6. Power on the Battery Charger/Power supply
Allow up to 2 minutes for the Modem and Receiver to power on, acquire signal and connect to the AllDayRTK Server

NOTE: Refer to Plug and Play Block Diagram, connections and Internal wiring diagrams for more information on all cables and connections.

AllDayRTK Enabling Geo-Precision

Connections

1. Plug in GNSS Antenna cable
2. Plug in 4G Antenna cable
3. Power up

GPS: N type - Female port
GNSS Antenna connection
Plug in the N-male LMR400 cable for the external GNSS Antenna

CELL1 : N type - Female Port
Primary External 4G (LTE) cellular connection
Plug the N to SMA adaptor provided.

CELL2 : N type - Female Port
Auxiliary External 4G (LTE) cellular connection

SERIAL RS232-Female Port
UHF For SATEL radio connection (Male to Male NULLMODEM adaptor required)
Configuration port to configure the MR2 receiver via TRU.
(RS232 Male to USB configuration cable is included in Plug and Play Kit)

ETHERNET: RJ45 Port
Ethernet WAN Port for Internet connection.
Plug NBN or Starlink internet router into this port.
This will allow the Base to connect to the AllDayRTK Network
using the on-site NBN/fixed line or Starlink internet.

Anderson 12V DC Power Port

ANDERSON PLUG: 12V Regulated DC Power Port
240V AC to 12V DC Power Supply

Quick Start Guide – Plug it in and AllDayRTK does the rest!

POWERED BY Aptella AUTOMATION + POSITIONING TECH

Post – Install checks

• Pre-configured to connect GNSS base to AllDayRTK Network on power up

- Every Plug and Play Kit will have a Kit number label on its door
- Once the Base Station is installed, all connections are made, and powered on, contact the AllDayRTK team at alldayrtk@aptella.com and quote the Kit number to perform connectivity checks and commence Base commissioning process.
- Installers provide photos and antenna serial number (Refer to Detailed Installation Guidelines)
- The AllDayRTK team will verify 4G signal strength, GNSS signal quality and onboard the base into the AllDayRTK Public or Focus Network after 5 business days.

NOTE: The team requires 3 consecutive days of GNSS Data, the Base must be powered on throughout the commissioning process.

Plug and Play Kit - Internal

All Day RTK
Enabling Geo-Precision

Internal Components

POWERED BY Aptella AUTOMATION + POSITIONING TECH

Cradlepoint S700 Modem

- Allows connectivity to AllDayRTK servers
- Facilitates Starlink/NBN connection to Base Station
- CELL1 and CELL2 ports on enclosure connect to Cellular Primary and Auxiliary ports of the modem respectively
- ETHERNET port on the enclosure connects to the WAN port of the modem

Topcon MR-2 GNSS Receiver

- GPS port on the enclosure connects to the antenna port of the MR-2
- Ethernet Port of the MR2 (via “Y-cable” connects to the LAN port of S700 modem
- COM1 port of the MR-2 (via “Medusa cable” connects to the UHF Port on the enclosure

Plug and Play Kit Number

- Plug and Play Kit number will be printed on the enclosure door
- This Kit number is necessary for Base Kit identification and commissioning process

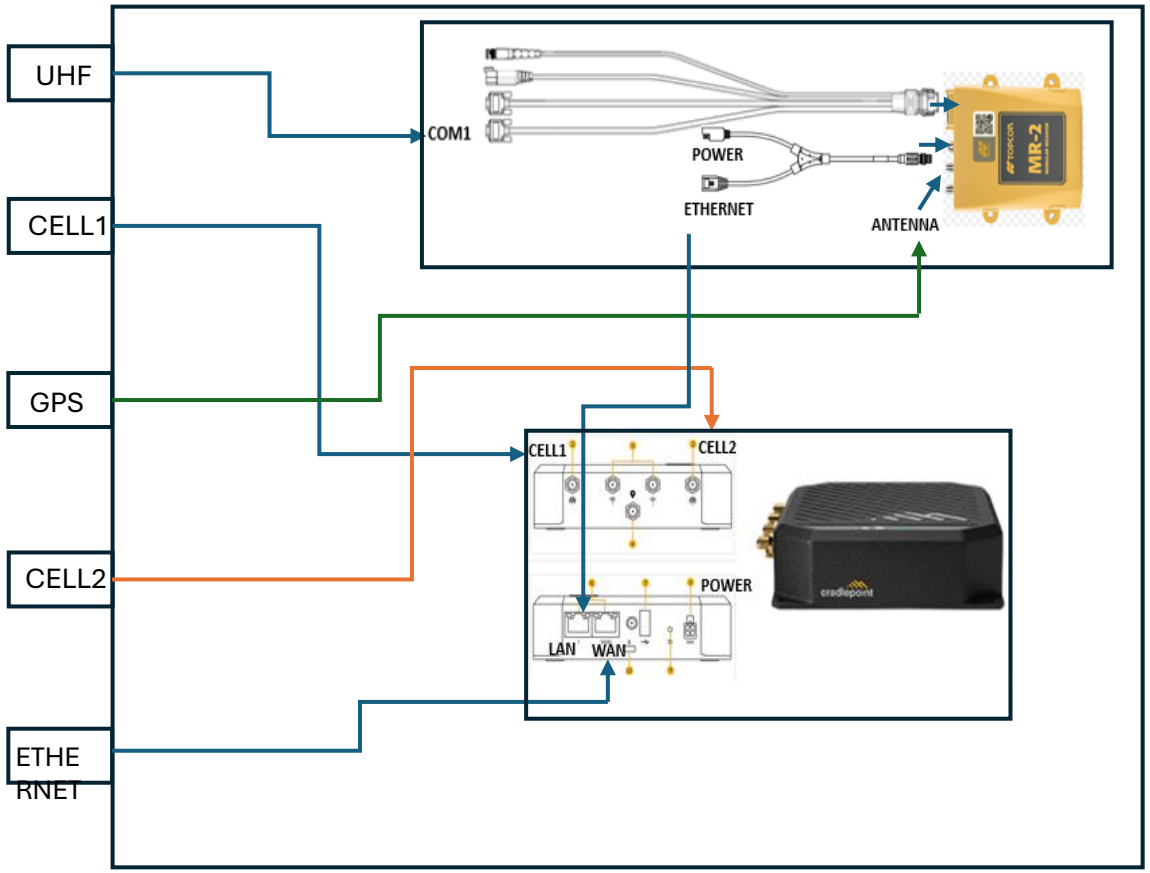
Technical Specifications

Modem and Communications	
Rugged IoT router	Dual SIM LTE / Starlink Ready
Interface	2 x SMA cellular 2 x 1 GbE LAN/WAN Wi-Fi 574 Mbps
Environmental	-20 to + 60 deg Celsius Humidity 10% to 90% IP30
Security	FIPS 140-3 Level 1 Module State firewall throughput 480 Mbps
Physical	123 x 118 mm 516 g

AllDayRTK Enabling Geo-Precision

POWERED BY Aptella AUTOMATION + POSITIONING TECH

Internal Wiring



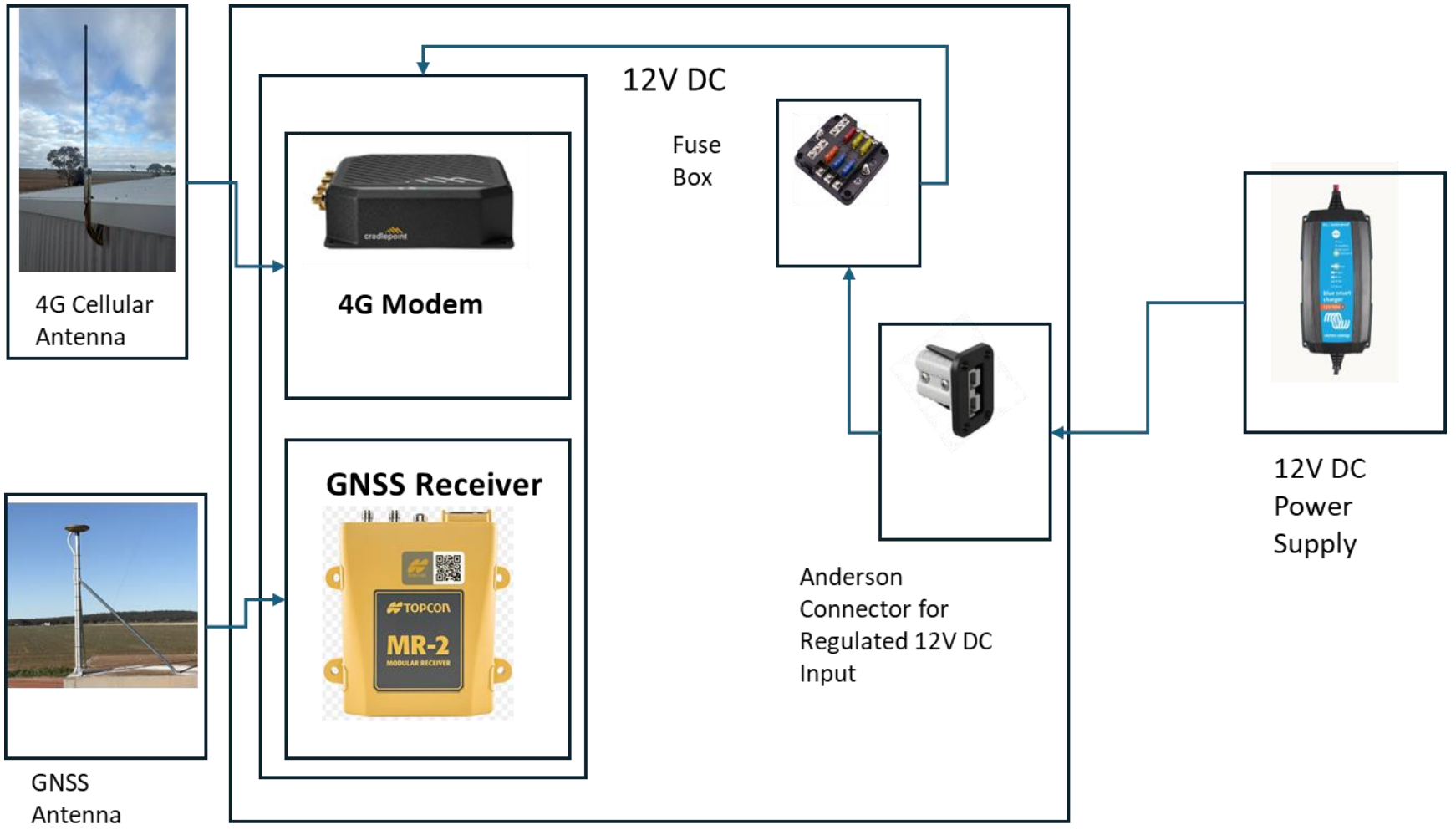
Technical Specifications

GNSS Topcon MR2	
Signals	Further proof all multi-GNSS Triple band (L1/L2/L5) GPS/GLONASS/Galileo/ BeiDou/QZSS
Accuracy	RTK Network corrections 10mm +0.5ppm 1 Sigma
Environmental	Operating -40 > 75 Deg. Celsius

GNSS Antenna Topcon G5-A1	
Signals	Full-Wave all multi-GNSS Triple band inc. 1230 and 1570 MHz inc SBAS
Physical	298 x 75 mm 1.3 Kg
Environmental	Operating -40 to + 75 deg Celsius
IP	Water / Dust IP67 IEC 60529

All Day RTK
Enabling Geo-Precision

Block Diagram



All Day RTK
Enabling Geo-Precision

Trouble Shooting

- All internal connections within the Plug and Play enclosure are tested and configured, however, there may be cases where equipment doesn't work as intended.

- No Power Lights on Modem or MR2 Receiver:
  - Check Fusebox if fuse is blown
  - Ensure modem power cable is plugged in securely
  - Refer to Internal Wiring diagram to identify Power cables

NOTE: LED Indicators on MR2 will be difficult to view due to its mounting position within the enclosure.

- For any issues
  - Contact the AllDayRTK team at alldayrtk@aptella.com

All Day RTK
Enabling Geo-Precision

Trouble Shooting – MR2 Status lights

POWERED BY Aptella AUTOMATION + POSITIONING TECH

LED Status Indicators on Topcon MR-2:

1.Power LED (PWR)

1. **Solid Green**: Receiver is powered and operating normally.
2. **Flashing Green**: Low power or power cycling.
3. **Off**: No power.

2.Ethernet LED (ETH)

1. **Solid Green**: Ethernet link is established.
2. **Flashing Green**: Data is being transmitted.
3. **Off**: No Ethernet connection.

3.Satellite Tracking LED (STAT)

1. **Solid Green**: GNSS satellites are being tracked, and position is fixed.
2. **Flashing Green**: Searching for satellites or no fix.
3. **Red**: Error in satellite tracking.

4.COM LED (COM1/COM2)

1. **Solid Green**: Port is active, and data is being transmitted.
2. **Flashing Green**: Intermittent data transmission.
3. **Off**: No communication.

Power LED

The Power LED indicates whether the receiver is on or off, and to indicate the status and type of OAF loaded.

Table 3. Power LED Patterns

LED Color	Description
⬭	When the LED is off, the receiver is off.
	When the LED is blinking or solid, the receiver is on and an OAF is loaded. See below for the types of OAF.
⬭ ⬭ ⬭	When the LED continuously blinks between red, green and yellow, a standalone positioning OAF is loaded.
⬭	When the LED is solid green, an RTK-enabled OAF is loaded.

Ethernet LED

The Ethernet LED indicates the status of the Ethernet connection.

Table 4. Ethernet LED Patterns

Display	Description
⬭	Solid Red: No Ethernet connection.
⬭	Solid Green: Ethernet Connection established.

All Day RTK
Enabling Geo-Precision

Trouble Shooting – Status Indicators – S700 Modem

POWERED BY Aptella AUTOMATION + POSITIONING TECH

POWER: Detects that the unit has power.	
●	No Light = Not receiving power. Check the power switch and the power source connection.
○	Solid White = Powered on.
NETCLOUD MANAGER STATE: Detects whether the device is able to connect to NCM	
●	No Light = Unable to connect to Netcloud Manager.
○	Solid White = Connected to NetCloud Manager.

EMBEDDED MODEM STATE: Indicates information about the integrated modem.	
●	**No Light** = Modem not detected
●	**Solid Green** = Modem has established an active connection
✳	**Flashing Green** = Modem is connecting
●	**Solid Yellow** = Data connection error.
✳	**Flashing Yellow** = Modem is in the process of resetting
●	**Solid Red** = Carrier reject
✳	**Flashing Red** = No SIM or SIM Door Open

CELLULAR HEALTH: Indicates the health of the primary cellular modem's signal.	
●	**No Light** = No cellular connection
●	**Solid Green** = Cellular health is excellent/good
●	**Solid Yellow** = Cellular heath is fair
●	**Solid Red** = Cellular Health is poor

Trouble Shooting – Power Cycle Modem

- Power Cycling the S700 modem:

  Unplug the Power cable from the modem, wait for 10seconds, Re-plug the power cable and wait for LED indicators to light up.

  Power cable highlighted in the image:

Trouble Shooting – Power Cycle MR2 GNSS

POWERED BY Aptella AUTOMATION + POSITIONING TECH

- Power Cycling the MR2 Receiver:

  Unplug the SAE Bullet connector Power cable from the “Y cable” connected to the MR2.
  Wait for 10seconds, Re-plug the power cable and wait for LED indicators to light up.

  Power cable highlighted in the image:

Trouble Shooting – UHF Options

- The Plug and Play kits are compatible with SATEL Radios
- Ensure the ACMA license for the frequency has been obtained and the correct frequency, desired Protocol and modulation settings have been loaded into the SATEL radio during pre-delivery stage.
- Once the SATEL radio is installed, connect a Male-to-male NULLMODEM adaptor (provided) to the SATEL Radio RS-232 Serial cable and plug the other end of the NULLMODEM adaptor to the UHF Port on the enclosure. See picture.
- Contact the AllDayRTK team and quote the Plug and Play Kit number to enable RTCM data output from the Receiver to the SATEL Radio.

Male-to-male NULLMODEM adaptor

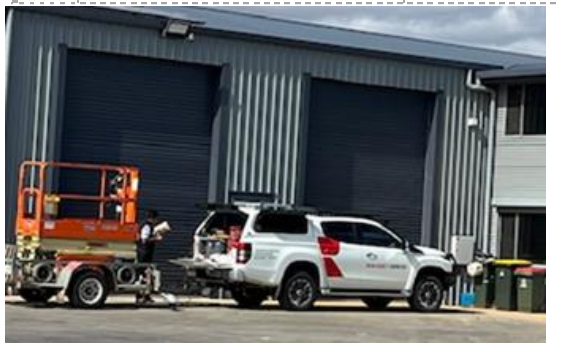
SATEL UHF Radio Setup with Plug and Play Kits

- The Plug and Play kits are compatible with SATEL Radios
- Ensure the ACMA license for the frequency has been obtained and the correct frequency, desired Protocol and modulation settings have been loaded into the SATEL radio during pre-delivery stage.
- Once the SATEL radio is installed, connect a Male-to-male NULLMODEM adaptor (provided) to the SATEL Radio RS-232 Serial cable and plug the other end of the NULLMODEM adaptor to the UHF Port on the enclosure. See picture.
- Contact the AllDayRTK team and quote the Plug and Play Kit number to enable RTCM data output from the Receiver to the SATEL Radio.

Safety Note: Example Safe Work Method Statement (SWMS)

POWERED BY Aptella AUTOMATION + POSITIONING TECH

JOB STAGES List the stages required to perform the task		HAZARDS List each potential hazard that could cause injury / damage when the task step is performed	INHERENT RISK (before)			AGREED CONTROLS List for each hazard the specific controls that are required to allow the job to be performed at a safe level	WHO WILL MAKE THIS HAPPEN	RESIDUAL RISK (after)		
			L	C	R			L	C	R
1	Roof access to the host site	Pedestrian/foot traffic		X		Spotter or signage	Operators on site	X		
		Hights while operating a ladder	X			Spotter or equipment to fasten ladder	Operators on site	X		
		Working in confined spaces	X			Spotter or access workspace before work commences	Operators on site	X		
		Traversing ruff surfaces	X			Ensure workspace is clear and wear appropriate footwear	Operators on site	X		
		Working on rooftop	X			Work within 1 meter from edge of site or ensure barricade is in place if required	Operators on site	X		
		Slips trips and falls	X			Ensure workspace is clear and wear appropriate footwear	Operators on site	X		
		Cuts and abrasions	X			Wear PPE where required	Operators on site	X		
		Sun exposure		X		Assess risk to sun exposure and use hats/sunscreen where necessary	Operators on site	X		



All Day RTK
Enabling Geo-Precision

Example of a finished site with directional photos

North direction

East

South

West

For an AllDayRTK site to be registered with Geoscience Australia and obtain a Regulation 13 certification requires 4 deflectional photos and photo of the antenna serial number, along with descriptions of the site, mast and roof material

All Day RTK
Enabling Geo-Precision