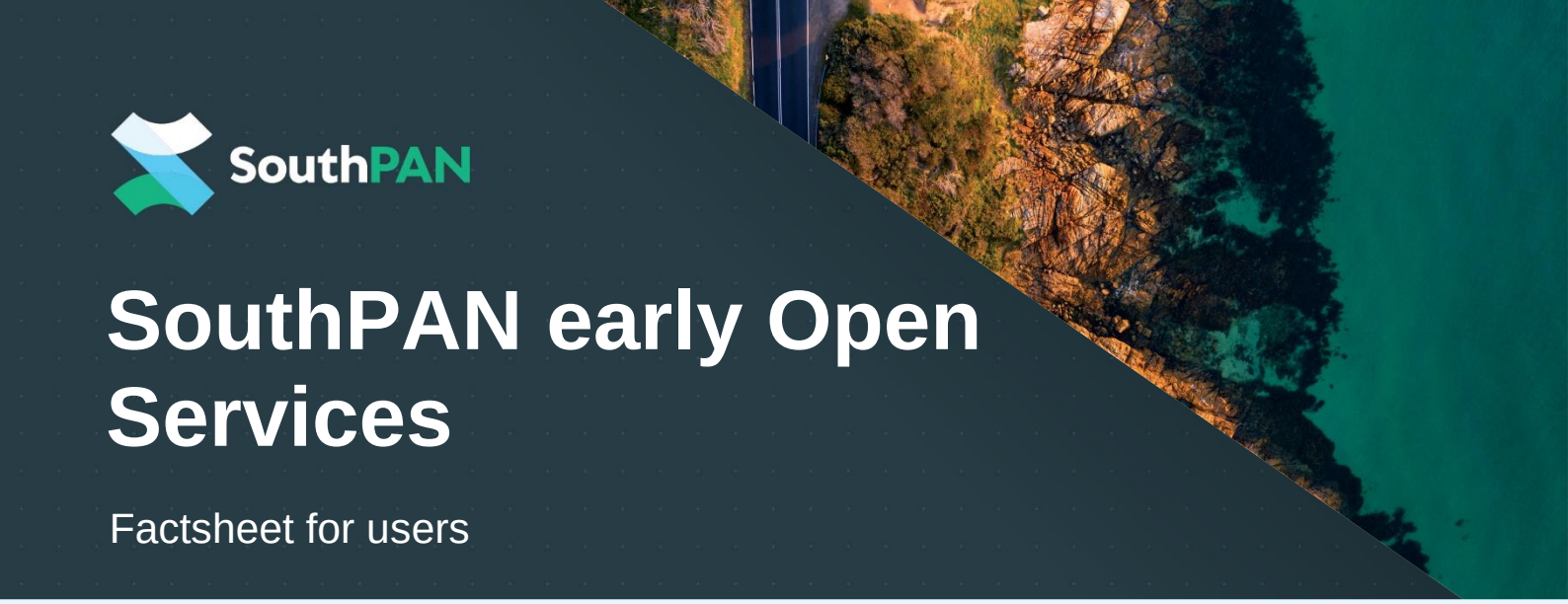


SouthPAN early Open Services

Factsheet for users

Version 1 September 2022

Introduction

This factsheet is intended for GNSS users who wish to access SouthPAN early Open Services.

SouthPAN is a Satellite-Based Augmentation System (SBAS) capability provided by Geoscience Australia and Toitū Te Whenua Land Information New Zealand.

Early Open Services became available to users in September 2022. A certified Safety of Life Service will be available from 2028.

What are Open Services?

Open Services are intended for all users that require better positioning than can be obtained from stand-alone GPS and Galileo, and where Safety of Life is not impacted by the user's positioning capability.

Early Open Services

SouthPAN will provide three early Open Services.

L1 SBAS Open Service

The L1 SBAS early Open Service will provide navigation messages on the L1 frequency (1,575.42 MHz), and allow users with a receiver that tracks GPS L1 C/A signals to improve their position accuracy to better than ≤3m in the horizontal and ≤4m in the vertical (95% confidence interval).

DFMC SBAS Open Service

The Dual Frequency Multi-Constellation SBAS early Open Service will provide navigation messages on the L5 frequency (1,176.45 MHz), and allow users—with a receiver that tracks GPS L1 C/A and L5 signals, and Galileo E1 and E5a signals—to improve their position accuracy to better than ≤1.5m in the horizontal and ≤2.5m in the vertical (95% confidence interval).

PVS Open Service

The 'Precise Point Positioning (PPP) via SouthPAN' (PVS) early Open Service will share the L5 frequency with the DFMC SBAS Open Service in the near future, before transitioning to a new navigation signal.

PVS will allow users—with a receiver that tracks GPS L1 C/A and L5 signals, Galileo E1 and E5a signals, and is capable of processing the PVS messages—to improve their position accuracy better than ≤0.40m in the horizontal and ≤0.55m in the vertical (95% confidence interval), after convergence. Convergence will be better than 80 minutes during PVS early Open Services, and the user does not need to remain stationary during the convergence period.

Using the early Open Services

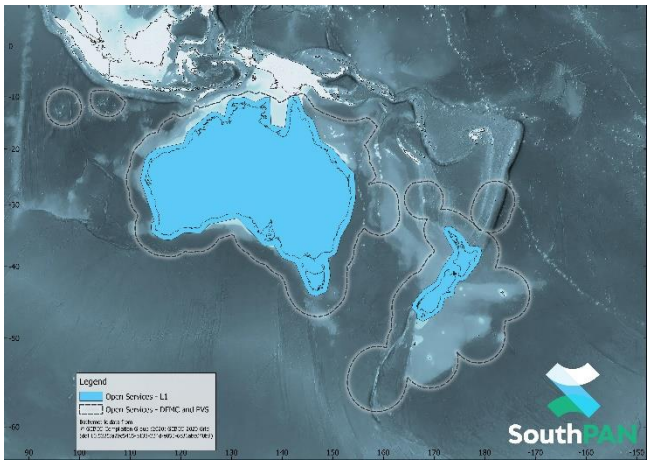
Many GNSS receivers can track and process SBAS transmissions on L1, however, a smaller range of receivers track L5 as well. Check with your manufacturer to learn more about the capability of your receiver.

Characteristics of SouthPAN early Open Service transmissions

- The SouthPAN early Open Services are broadcast from the Inmarsat 4F1 geostationary satellite located at 143.5° East longitude, using the pseudorandom noise code (PRN) code 122. Satellite ranging cannot be performed with PRN 122.
- The Service Provider ID bits of the health and status word of Message Type 17 will be set to '8' to indicate the navigation messages are provided by SouthPAN.
- SouthPAN will transmit Message Type 27 'SBAS Service Message'. SouthPAN will not transmit Message Type 28 'Clock-Ephemeris Covariance Matrix Message' in the near future.
- The L1 SBAS navigation message will include the Message Type 0 'Don't use for safety applications' to indicate the Safety of Life Service is not yet available. Message Type 0 will reflect the contents of Message Type 2. You may need to configure your receiver to treat MT0 as MT2 to use the SouthPAN L1 SBAS early Open Service.
- Similarly, the DFMC SBAS navigation message will include MT0 instead of message Types 34, 35, and 36.

Where can I access the early Open Service?

The L1 SBAS early Open Service is available inside the blue area in the figure. The DFMC SBAS and PVS early Open Services are available inside the dotted lines.



Next Steps

SouthPAN Open Services will be improved in the coming years as infrastructure is deployed, increasing functionality and performance. New geostationary satellites, reference stations, and redundant telecommunications networks will result in better accuracy and availability.

The PVS Open Service will migrate from L5 to a new navigation signal centred on 1,207.14 MHz, and a new message format will be published. The combination of the new signal and format will further improve PPP accuracy and convergence times.

SouthPAN Open Services will also be provided over the internet alongside the satellite broadcast. For any questions about these future improvements, please refer to the contact details below.

Further reading

The following documents contain additional information about SouthPAN services and SBAS technology:

- SouthPAN Service Definition Document for Open Services
- RTCA DO-229F: Minimum Operational Performance Standards for GPS / SBAS Airborne Equipment
- EUROCAE ED-259: Minimum Operational Performance Standards for Galileo / GPS / SBAS Airborne Equipment

Contact Us

Email

ClientServices@ga.gov.au

southpan@linz.govt.nz

Phone

1800 800 173 (Australia)

0800 665 463 or +64 7 974 5595 (New Zealand)

Website

www.ga.gov.au/southpan

www.linz.govt.nz/southpan