Specifications													
Model				1	rs-2910	TS-2	2912	TS-29	914	TS-2922		TS-2924	
	Time source				l		GNS	s (GPS, QZSS, G	alileo, GLONAS	5S)			
Holdover accuracy*1		OCXO			pe-C / Type-A	Type-C	/ Type-A	Type	A	Type-A		Type-A	
	1PPS			4 (51) 4000 40144						1			
Pulse output		10MHz		1	1:(Either TPP	S or TOMH:	Z)	-		1	1 -		
	100BASE-TX / 1000BASE-T				2		1	-		1		_	
Ethernet interface	SFP-optical (1000BASE-X)				-		1	2		-		_	
	SFP-optical (1000BASE-X/10GBASE-R)				-	-	_	-		2		2	
LAN connector		RJ-45			1								
	Memory card				Compac	tFlash		-		SD	memory o	ard	
	Number of	Number of avialable interface port			2					3		2	
	Correction accuarcy (When GNSS locked)			UTC within < 40ns (PRTC-B)									
	Profile			Default Profile (IEEE1588v2), Telecom profile (G.8265.1, G.8275.1, G.8275.2), IEEE802.1AS-2011 (qPTP) *2									
PTP	Protocol			IPv4 UDP / Ethernet									
	Delay mechanism			Delay request-response (Default Profile, Telecom Profile) / Peer Delay (IEEE802.1AS-2011)									
	Sync mes	Sync message transmission type				1step (D	efault Pro	file, Telecom Pro	file) / 2step (IE	EE802.1AS-201	I)		
	Maximun	n processing capal	oility		Sync: 128pps*3*4, Delay_request (receive): 128pps*3*4, Announce: 8pps								
	Maximum numbe	er of connectable s	lave devices			12	8*3			1024*4			
	Number of	Number of avialable interface port			2					To Be Supported			
NTP	Correction acc	Correction accuarcy (When GNSS locked)			±1ms								
		Protocol			NTP _s SNTP								
	Recommended processing capability			500pps									
	SyncEther			Master function supports ITU-T G.8261, G.8262 and G.8264									
Network	VLAN			Tag-based VLAN (IEEE 802.1Q)									
		Routing			Static								
		Monitoring		SNMP (v1/v2c/Private MIB), S					te MIB), SYSLO	IIB), SYSLOG			
	Authentication			RADIUS, Local authentication									
Management (IPv6)	Remote connections			TELNET, SSH, FTP, SFTP, TFT						P			
		ZTP			Confguratio	on Deployn	ment, Firm	ware Update	Update		To Be Supported		
	TS-2910	/ TS-2912	TS-29	14	TS-2922	TS-2	974	TS-291() / TS-2912	TS-	2914	TS-2922	
Model	-10	-12	-12		-12	-1	2	-20	-22		22	-22	
Rated voltage		DC-40.5V to -	57.0V		DC-40.5 to -57.6V	DC-40.5 t	to -57.0V		AC100V to AC	240V ±10% (5	0/60Hz) *	5	
Rated current	0 37A (DC-48V)				0.42A (DC-48V) 0.38A (DC-		C-48V)	(48V) 0.34A / 0.19A		0.32A	/ 0.17A	0.40A / 0.22A	
Power consumption	18.0W				20.2W 18.2		2W 20.0W		18	.0W	21.2W		
Calorific value	64.8kJ/h				72.7kJ/h 65.5kJ		J/h 72.0kJ/h		64.	3kJ/h	76.3kJ/h		
Model	TC 201	0 / TS-2012			TC-2014	1		TC 2022			TC 20	24	
			-40 to 70°C			0 to 50%			-40 to 65°C				
	0	0 to 50 °C			-40 t0 /0 C U t0 50 C						-40 10 0		
	On the ch	On the shalf (herizontal)			(all mount, note mount, atc. Pack mount					Wall mount and mount at-			
	Un the sh	Un the shell (norizontal)			vaii-mount, pole-mount, etc.			Kack-mount			waii-mount, pole-mount, etc.		
(without protrusions)	$208 (W) \times 282 (D) \times 44 (H) mm$ 3			12 (W)	12 (W) × 102 (D) × 430 (H) mm			425.5 (W) × 280 (D) × 44 (H) mm			312 (W) × 102 (D) × 430 (H) mm		

6.5kg

VCCI-A、RoHS、IP65

Certificates

Weight (approximate)

Optional Accesoories

*1: The holdover accuracy, varying with the oscillator installed in this product, is as follows. Regardless of the model, a common accuracy is achieved with the selected oscillator.

OCXO Type-C: 1.5 microseconds/2 hours / 50 microseconds/24 hours OCXO Type-A: 400 seconds nano seconds/5 hours / 1.5 microseconds/24 hours *2:Support for IEEE802.1AS-2011 (gPTP) is available as an optional feature.

*3:The maximum number of slaves is limited to 128pps for up to 32 nodes, 64pps for up to

2kg

VCCI-A、RoHS

64 nodes, and 32pps for up to 128 nodes. *4: The maximum number of slaves is limited to 128pps for up to 128 nodes, 64pps for up to

256 nodes, 32pps for up to 512 nodes, and 16pps for up to 1024 nodes. *5:For use with AC240V an aaplicable power cable is necessary.

(Model Number Format Example) TS-291X-YZ

SEIKO

X=0:Copper Ports×2 X=2:SFP Port×1+Copper Port×1

Y=1:DC Power Model Y=2:AC Power Model Z=0:OCXO Type-C Z=2:OCXO Type-A

* All the Seiko Solutions product listed in this brochure comes with a complimentary one-year warranty period. Specifications, designs, and other details mentioned in this brochure are subject to change without prior notice for improvement purposes
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Multi GNSS antenna, GNSS antenna pole, GNSS extension cable, GNSS amplifier, GNSS arrester GNSS antenna (TS-210) GNSS antenna (TS-210) + + holder pole (TS-211) (TS-212) Optior * Image when TS-210 attached

6.5kg

VCCI-A、RoHS、IP65

3.6kg

VCCI-A, RoHS





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2412-SS02-BS



Empowering diverse social infrastructure with precise timing

In modern society, ensuring efficiency, reliability, and safety in critical infrastructure depends significantly on precise time synchronization. Seiko, with its proven track record as a PTP Grandmaster Clock provider in the mobile carrier industry, offers high-precision time synchronization solutions across various domains.



Seiko's GMC is the exclusive solution for meeting high-precision time synchronization needs, offering flexibility in selecting the communication interface and indoor/outdoor models to suit your deployment environment.

Seiko's Time Server Pro, series designed with an extensive foundation of knowledge, delivers nanosecond-level, high-precision time synchronization, meeting the international standard PRTC-B requirements, a critical component for 5G mobile network deployments.

Achieves precise synchronization for 5G network demands

infrastructure, along with top-notch customer support

- Complies with PRTC-B via multi-GNSS support and enhanced signal reception • Features high-performance receivers with anti-jamming and multipath mitigation Backed by extensive experience in the communication industry and critical
- PRTC-B, defined in the international standard (G.8272), sets the accuracy for a Primary Reference Time Clock (PRTC) device to achieve a time error of within 40 nanoseconds relative to UTC. This level of precision is required to achieve more accurate time synchronization than PRTC-A (within 100 nanoseconds) offers.

Indoor Model TS-2910 Series

Compact model ideal for multi-site base station deployments

A simple and cost-effective model with the features necessary for high-precision time stamping logic. The indoor installation model, which can accommodate two units in a 1U space, allows flexible selection of power and oscillators. Saving the device settings to a CF card enables swift recovery in case of malfunctions.



TS-2910 (AC Model)

Equipped with two versatile copper ports (electric) for PTP interfaces. Suitable for systems where all equipment is centralized within the same facility.



TS-2912 (AC Model)

Equipped with one SFP port (optical) and one copper port (electric) for PTP interfaces. Ideal for wide-area systems that connect over long distances using optical cables.

Time Synchronization System in a 5G Mobile Network



Centralized Radio Access Network Open Radio Access Network

O-RAN (Open Radio Access Network) is a specification that opens up interfaces between RU-DU and DU-CU, emphasizing interoperability with various vendor equipment.

Mobile applications and its time-sync accuracy requirements

Category	Application	TAE*
A+	MIMO or TX diversity transmission, at each carrier frequency	65 ns
Α	Intra-band contiguous carrier aggregation with or without MIMO or TX diversity	130 ns
В	Intra-band non-contiguous carrier aggregation with or without MIMO or TX diversity, and Inter-band carrier aggregation, with or without MIMO or TX diversity	260 ns
С	TD-LTE	3 µs

on Trends in High-Precision Time and Frequency Synchronization Technologies for Achieving 5G Mobile Networks, NTT Technical Journal, Vol. 30, No. 11, pp. 44-48, 2018.

Indoor Model TS-2920 Series

A 10G-compliant model required for the O-RAN era

Building upon the fundamental specifications of the TS-2910 Series, this 1U-sized model incorporates a 10Gbps interface to enhance connectivity allowing time synchronization for up to 1024 devices and supports power redundancy.



TS-2922 (DC Model)

Equipped with one SFP port (optical) and one copper port (electric) for PTP interfaces. Ideal for wide-area systems that connect over long distances using optical cables.

Distributed Radio Access Network

n addition to the $1.5 \,\mu$ sec precision required in traditional 4G TD-LTE networks, the realization of highspeed, low-latency networks in 5G necessitates even greater accuracy in time synchronization across the entire network. The ITU-T has established a standard for the required precision of a GMC known as PRTC-B, with an accuracy evel set at less than UTC \pm 40 nsec.

Outdoor Models TS-2914 and TS-2924

Outdoor-installable models compliant with IP65 standards

Building upon the features of the TS-2912, it is well-suited for use in base stations installed in a variety of environments, regardless of location.

TS-2914/TS-2924

TS-2924 is compatible with a 10Gbps interface, making it suitable for even broader applications.

