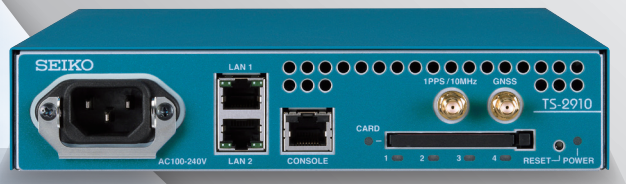
SEIKO

Time Server Pro.

TS-2910 / TS-2920 Series

Carrier-grade compact grandmaster for 5G network timing

TS-2924



TS-2910

GNSS PTP 1PPS 10MHz

Features

- Simple structure in a half-rack unit with functions required for high-precision time embossing logic.
- Meets highly strict 5G network synchronization requirement by installing in backhaul.
- Compliant with PRTC-B by multi GNSS support and signal reception algorithm improvement.

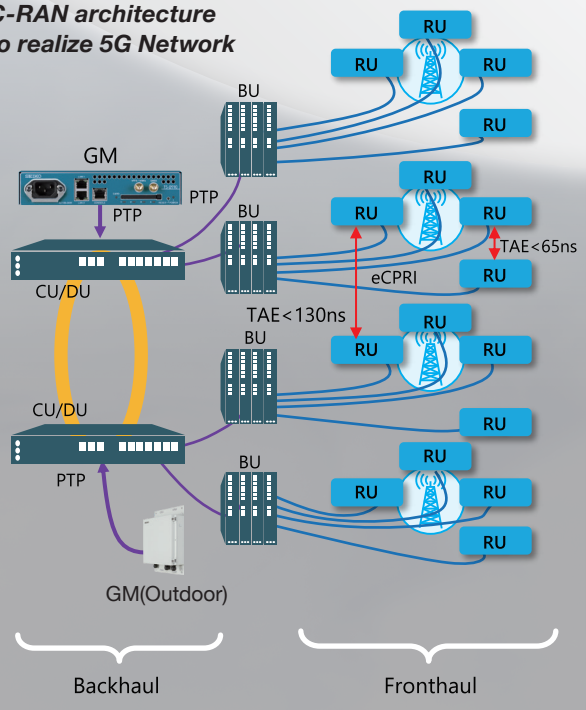
How TS-2910 realizes 5G Network

- GM deployed in backhaul enables transformation to 5G network without significant change of its current architecture.
- Outdoor GM can be connected to in-house facilities with optical fibers to form robust backhaul network.

5G Time Synchronization Accuracy Requirements

Category	Application/Function	Time Budget Error
A+	MIMO or TX diversity transmission, at each carrier frequency	65ns
A	Intra-band contiguous carrier aggregation with or without MIMO or TX diversity	130ns
B	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	260ns
C	TD-LTE	1.5μs

C-RAN architecture to realize 5G Network



GM in backhaul of C-RAN keeps TAE between RUs within the prescribed value to meet 5G NW requirement

GM : Grandmaster
PTP : Precision Time Protocol
C-RAN : Centralized Radio Access Network
eCPRI : evolved Common Public Radio Interface

TAE : Time Alignment Error
CU : Centralized Unit DU : Distributed Unit
RU : Radio Unit BU : Baseband Unit

SEIKO SOLUTIONS INC.

Time Server Pro. TS-2910 / TS-2920 Series

TS-2910 series

Basic model with two versatile Ethernet ports.
Suitable for a system with all equipment gathered in the same facility.

DC model

TS-2912 series

Carrier optimized model with a traditional Ethernet port and a SFP port.
Ideal for a system installed in a wide area connected with optical cables.

DC model

TS-2914 / TS-2924

IP65 Compliant. Function and performance are the same as TS-2912 series.

GNSS Antenna

TS-210/TS-211

Operation Temperature	-40ºC to 85ºC
External dimensions	ϕ66.5×47.5 (H) mm
Weight	approx. 150g (10m cable included)

Model			TS-2910				TS-2912				TS-2914		TS-2924
			-10	-20	-12	-22	-10	-20	-12	-22	-12	-22	-12
Time source	GNSS	GPS	Yes										
		QZSS	Yes										
		GLONASS	Yes										
		Galileo	Yes										
Holdover accuracy*1	OCXO Type-A		--		400ns/5Hrs 1.5μs/24Hrs		--		400ns/5Hrs 1.5μs/24Hrs				
	OCXO Type-C		1.5us/2Hrs 50us/24Hrs		--		1.5us/2Hrs 50us/24Hrs		--				
Pulse output			1PPS / 10MHz								unsupported		
Ethernet interface			100BASE-TX / 1000BASE-T 2 ports				SFP-optical (1000BASE-X) 1 port, 100BASE-TX / 1000BASE-T 1 port				SFP-optical (1000BASE-X) 2 ports		SFP+ optical (1000BASE-X*2 / 10GBASE-R) 2 ports
PTP	Number of available interface port		2										
	Correction accuracy (When GPS locked)		UTC within 40 ns										
	Profile		Default Profile (IEEE1588v2), Telecom profile for Frequency (G.8265.1), Telecom profile for phase/time (G.8275.1), Telecom profile for phase/time (G.8275.2), IEEE802.1AS-2011 (gPTP)										
	Protocol		IPv4 UDP/ Ethernet										
	Delay mechanism		Delay request-response (Default Profile, Telecom Profile) / Peer Delay (IEEE802.1AS-2011)										
	Sync. message transmission type		1 step (Default Profile, Telecom Profile) / 2 step (IEEE802.1AS-2011)										
	Maximum processing capability		Sync : 128 packet s/sec*3, Delay request (receive) : 128 packets /sec*3, Announce : 8 packets/sec										
	Maximum number of connectable slave devices		128*3										
SyncEther			Yes										
syslog			Yes										
Telnet, SSH			Yes										
IPv6			Only management functions (SNMP, telnet, ssh, syslog, ftp, tftp, RADIUS authentication, etc.) are supported										
VLAN			Yes										

Characteristics	TS-2910		TS-2912		TS-2914	TS-2910		TS-2912		TS-2914	TS-2924
	-20	-22	-20	-22	-22	-10	-12	-10	-12	-12	-12
Rated voltage	AC100V ~ AC240V±10% (50/60 Hz)*4					DC -40.5V ~ -57.0V					
Rated current	0.34A/0.19A				0.32A / 0.17A	0.37A					0.38A
Power consumption	20W				18W	18W					18.2W
Calorific value	72.0kJ/h				65.8kJ/h	64.8kJ/h					65.52kJ/h
Operation temperature	0 ~ 50 °C				-40 ~ 70 °C	0 ~ 50 °C				-40 ~ 70 °C	TBD
Operation humidity	15 ~ 85% RH (no condensation)										
Installation style	On the shelf (horizontal)				Wall-mounted, pole-mounted, etc.	On the shelf (horizontal)				Wall-mounted, pole-mounted, etc.	
Dimensions	208(W) x 282(D) x 44(H) mm				312(W) x 102(D) x 430(H) mm	208(W) x 282(D) x 44(H) mm				312(W) x 102(D) x 430(H) mm	
	(projection not included)										
Weight	Approx. 2kg				Approx. 6.5kg	Approx. 2kg				Approx. 6.5kg	
Certificates	VCCI-A, RoHS				VCCI-A , RoHS, IP65	VCCI-A, RoHS				VCCI-A , RoHS, IP65	
GNSS antenna	Multi GNSS antenna, antenna holder										

*1 Depends on the oscillator selected for the required holdover performance. *2 Will be supported in future update.
*3 Depends on the number of slaves: 128 packets/sec for up to 32 nodes, 64 packets/sec for up to 64 nodes, and 32packets/sec for up to 128 nodes.
*4 For use with AC 240V an applicable power cable is necessary.

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