

» SYNC DEFENDER

SECURE TIMING FOR YOUR NETWORK



KEY BENEFITS

Enhance the security of your network

Synchronise up to five separate physical LANs with dependable timing

Safeguard the integrity of your systems with a security-hardened network stack purpose built for timing

Strengthen the resilience of your network with multiple reference inputs and oscillator upgrade options

Future-proof your system architecture with scalable modular design

Five year warranty and free-of-charge lifetime firmware updates

Sync Defender is the ideal solution for secure synchronised timing on computer networks.

SECURE DEPENDABLE TIMING

Sync Defender enhances the security of your network providing a trusted stable stratum 1 NTP time source behind your firewall. Available with one to five timing LAN ports, Sync Defender enables secure synchronised dependable timing on up to five separate physical networks.

SECURITY-HARDENED

Sync Defender helps safeguard the integrity of your systems with its security hardened design. It incorporates a proprietary network stack built from the ground up to provide secure stable timing. As a result of this intentional design methodology, the timing LAN ports only implement the essential protocols needed for timing.

NETWORK RESILIENCE

Sync Defender strengthens the resilience of your network by offering a choice of reference inputs, antenna upgrades and enhanced holdover performance oscillators.

Standard configurations include a single internal GNSS decoder with anti-jam technology and selectable support for GPS, GLONASS and Galileo.

The optional second internal GNSS decoder card adds dual redundancy for mission critical installations.

Alternatively, a reference input card is available to add support for a GPS6000 system to enable simple installation of a GNSS system in large buildings and data centres by use of existing structured cabling.

The optional anti-jam timing antenna enables reliable GNSS operation in the most demanding weak signal and hostile RF environments.

For improved holdover performance, a choice of oscillator upgrades are available including a high stability OCXO option that allows Sync Defender to continue operating seamlessly during extended periods of synchronisation loss.

SCALABLE MODULAR DESIGN

Sync Defender allows you to future-proof your system architecture with its scalable modular design. You can easily add additional LAN cards as your network grows, allowing you to securely synchronise up to five separate physical networks.

A range of optional expansion cards are also available, enabling secure synchronisation of your network with industrial systems and other equipment.

FIVE YEAR WARRANTY

Sync Defender comes with a five year warranty as standard. You also get free-of-charge lifetime firmware updates and technical support.



Part No	Description	Holdover Performance
SD-301-TCXO	Temperature Compensated Crystal Oscillator	2 msec per day
SD-302-OCXO	Oven Controlled Crystal Oscillator	500 µsec per day
SD-303-OCXO-HS	High Stability Oven Controlled Crystal Oscillator	75 µsec per day

OSCILLATOR OPTIONS

Sync Defender is available with a choice of oscillator options to provide improved holdover performance during periods of synchronisation loss.

IMPROVED HOLDOVER PERFORMANCE

The SD-301-TCXO offers economical holdover performance, enabling Sync Defender to continue providing stable timing during short periods of synchronisation loss. All but the most basic model of Sync Defender are fitted with the SD-301-TCXO oscillator as standard.

The SD-302-OCXO provides a good balance between cost and performance, offering improved holdover performance at a competitive price. The SD-302-OCXO enables Sync Defender to continue providing accurate timing for your network during longer periods of synchronisation loss.

Designed for the most demanding mission critical applications, the SD-303-OCXO-HS delivers superb holdover performance. This allows Sync Defender to continue performing seamlessly during extended periods of synchronisation loss.

TIME REFERENCES

Sync Defender offers a flexible choice of time reference options.

MULTI-CONSTELLATION GNSS

The SD-101-GNSS decoder card provides multi-constellation GNSS support for your Sync Defender. With 32 satellite parallel tracking and class-leading high-performance design, the SD-101-GNSS synchronises your Sync Defender to within 30 nsec of UTC.

The SD-101-GNSS decoder card incorporates anti-jamming technology and offers selectable support for GPS, GLONASS and Galileo. The card provides real time diagnostics and active antenna monitoring. User programmable cable delay compensation ensures timing accuracy is maintained over long cable runs.

An SD-101-GNSS decoder card is fitted to all standard configuration Sync Defender models.

DUAL REDUNDANCY

Sync Defender enables you to strengthen the resilience of your network by adding a second dual redundant input reference card. Depending on your specific resilience needs, you could choose two SD-101-GNSS cards

with each set to a different GNSS constellation; you may choose to configure the second card as an identical live backup. Alternatively, a special-order reference input option may be more suitable. Sync defender allows you to configure the time reference cards to meet your redundancy and resilience needs.

SIMPLIFYING INSTALLATION

The SD-102-EXT external time reference interface card adds support for a GPS6000 system. By moving the RF decoding from within the Sync Defender to a remote GPS6000 system, the majority of the cable link to the antenna can be made using existing structured cabling rather than dedicated RF coaxial cables. In a large building or data centre, this can reduce installation costs significantly, as well as simplifying the installation process.

TIMING ANTENNA UPGRADE

The optional SD-105-ANT high-gain anti-jam timing antenna provides improved operation in the most demanding weak signal and hostile RF environments.

A range of accompanying cables and accessories are available.



Part No	Description
SD-101-GNSS	Multi-constellation GNSS decoder card
SD-102-EXT	External time reference interface card
SD-103-RTC	Real-time clock module
SD-105-ANT	High-gain anti-jam timing antenna

MODEL COMPARISON CHART »

OUTPUT OPTIONS

Sync Defender is based on a scalable modular design allowing you to add additional outputs as your network grows.

MULTIPLE NETWORKS

The SD-401-ETH timing LAN card delivers the capability to securely synchronise an additional physical network from your Sync Defender.

To maintain network isolation, each card incorporates its own processor running its own security-hardened network stack. As well as ensuring segregation between your networks, this isolated multi-processor approach guarantees that high bandwidth utilisation on one physical network port will have no effect on the available bandwidth of another.

All models of Sync Defender have one timing LAN integrated onto the motherboard. The Sync Defender 200 model is also fitted with a single SD-401-ETH timing LAN card, providing two timing LANs in total. Optionally, an additional three further SD-401-ETH timing LAN cards can be installed. This enables Sync Defender 200 to provide secure synchronised timing on up to five separate physical networks.

INDUSTRIAL OUTPUTS

Sync Defender is available with a range of optional expansion cards providing high accuracy time synchronisation for industrial systems and other equipment.

The SD-420-232 expansion card adds a serial time and date output and PPS output at RS-232 signal levels. Data can be transmitted in one of 27 different data formats.

The SD-421-485 expansion card provides a serial time and date output at RS-485 signal levels.

The SD-425-PPS expansion card offers a high accuracy pulse per second (PPS) output.

The SD-426-IRIG expansion card provides a 1KHz amplitude modulated IRIG-B timecode output.

Further expansion card options are available to special order.

	Sync Defender 50	Sync Defender 100	Sync Defender 200
Timing LANs	1	1	2 *
Optional maximum Timing LANs *	-	-	5
TCXO (option SD-301-TCXO)	-	YES	YES
OCXO (option SD-302-OCXO)	-	OPTION	OPTION
High stability OCXO (option SD-303-OCXO-HS)	-	OPTION	OPTION
Multi-constellation GNSS decoding	YES	YES	YES
Security-hardened built for timing network stack	YES	YES	YES
NTP authentication	YES	YES	YES
Secure firmware upgrades	YES	YES	YES
Dual redundant time reference	-	OPTION	OPTION
External time reference interface (option SD-102-EXT)	OPTION	OPTION	OPTION
RS-232 expansion card *	OPTION	OPTION	OPTION
RS-485 expansion card *	OPTION	OPTION	OPTION
PPS expansion card *	OPTION	OPTION	OPTION
IRIG-B expansion card *	OPTION	OPTION	OPTION
Dual redundant power *	OPTION	OPTION	OPTION
DC power	OPTION	OPTION	OPTION
Warranty	5 YEARS	5 YEARS	5 YEARS

* Sync Defender has four expansion card / timing LAN card slots in total. Each of the above options marked with an asterisk will occupy one expansion card slot.

Model Variations:

Sync Defender 50:	1 timing LAN, GNSS support
Sync Defender 100:	1 timing LAN, TCXO, GNSS support
Sync Defender 200:	2 timing LANs, TCXO, GNSS support

Time Reference Options:

SD-101-GNSS:	Multi-constellation GNSS decoder card
SD-102-EXT:	External time reference interface card
SD-103-RTC:	Real-time clock module

Oscillator Options:

SD-301-TCXO:	TCXO oscillator
SD-302-OCXO:	OCXO oscillator
SD-303-OCXO-HS:	High stability OCXO oscillator

Power Input Options:

SD-501-DUAL-MAINS:	Dual redundant mains power
SD-502-DC-9-36:	DC power supply
SD-503-DC-NEG-48:	Negative 48V DC power supply

Output Options:

SD-401-ETH:	Timing LAN card
SD-420-232:	RS-232 expansion card
SD-421-485:	RS-485 expansion card
SD-425-PPS:	Pulse per second output expansion card
SD-426-IRIG:	IRIG-B timecode output expansion card

Antenna Options, Cables and Accessories:

SD-105-ANT:	High-gain anti-jam timing antenna
SD-106-BRK:	L bracket for timing antenna
SD-107-SRG:	Standard lightning arrester
SD-108-SRG-PLUS:	Advanced lightning arrester
SD-201-TT03:	3m TNC-TNC antenna / arrester cable
SD-202-TT10:	10m TNC-TNC antenna / arrester cable
SD-203-TT25:	25m TNC-TNC antenna / arrester cable
SD-211-TS03:	3m TNC-SMA arrester / SD cable
SD-212-TS10:	10m TNC-SMA arrester / SD cable
SD-213-TS25:	25m TNC-SMA arrester / SD cable

TECHNICAL SPECIFICATIONS >>

Timing LAN Specifications:

Supported protocols:	NTP v2/v3/v4, SNTP v3/v4, DHCP
NTP authentication:	SHA1, MD5
NTP performance:	5000 NTP packets per sec (each port, unauthenticated)
NTP timestamp accuracy:	Within 30 µsec of internal timebase
Link speed:	10Base-T / 100Base-TX auto-sensing

Holdover Performance (at 20 °C, after 24 hours GPS sync):

SD-301-TCXO:	2 msec per day
SD-302-OCXO:	500 µsec per day
SD-303-OCXO-HS:	75 µsec per day

Internal GNSS decoder (version SD-101-GNSS) Specifications:

GNSS engine:	32 satellite parallel tracking
GNSS constellations:	GPS, GLONASS, Galileo
Min. acquisition sensitivity:	-148dBm (cold start)
Min. tracking sensitivity:	-160dBm
Synchronised accuracy:	30 nsec (1 sigma)
RF input:	SMA connector

PPS Expansion Card (SD-425-PPS) Specifications:

PPS accuracy:	50 nsec
Output:	BNC, TTL into 50 ohms

IRIG-B Expansion Card (SD-426-IRIG) Specifications:

Data format:	1KHz amplitude modulated IRIG-B
Output:	BNC, 3V p-p into 50 ohms

RS-232 Expansion Card (SD-420-232) Specifications:

RS-232 data accuracy:	50 µsec
RS-232 PPS accuracy:	1 µsec
Connector:	DB-9 (DE-9) female D-Sub (DCE)

RS-485 Expansion Card (SD-421-485) Specifications:

RS-485 data accuracy:	50 µsec
Connector:	Detachable screw terminal block

Mechanical, Electrical and Environmental Specifications:

Display:	20 x 2 alphanumeric backlit LCD
Keypad:	Capacitive touch sensing
Status LEDs:	18 x white status LEDs
Enclosure dimensions:	430 x 220 x 44 mm (excl. rack brackets)
19" rack configuration:	1 U high 19" rack mounting
Enclosure weight:	3 kg
Packed weight:	4 kg
Update port:	USB spec. 2.0 compliant type B full speed
Power consumption:	< 40 watts
Power inlet:	100-250VAC 50/60Hz dble. fused IEC C14
Optional 2nd power inlet:	100-250VAC 50/60Hz dble. fused IEC C14
Operating temperature:	0 to 50 °C
Relative humidity:	0% - 95%, noncondensing
Warranty:	5 years from date of supply

Certification Approvals:

Safety requirements:	BS EN 62368-1: 2024
Emission requirements:	BS EN 55032: 2015 +A1:2020
Immunity requirements:	BS EN 55035: 2017 +A11:2020
Radio equipment directive:	EN 303 413: V1.2.1 (2021-04)
CE / UKCA:	Meets all applicable directives
RoHS:	RoHS compliant