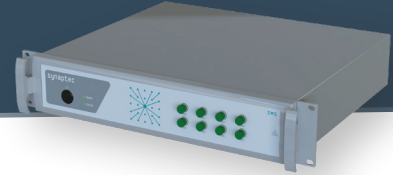


Interrogators



Distributed Electrical Sensing (DES) Interrogator

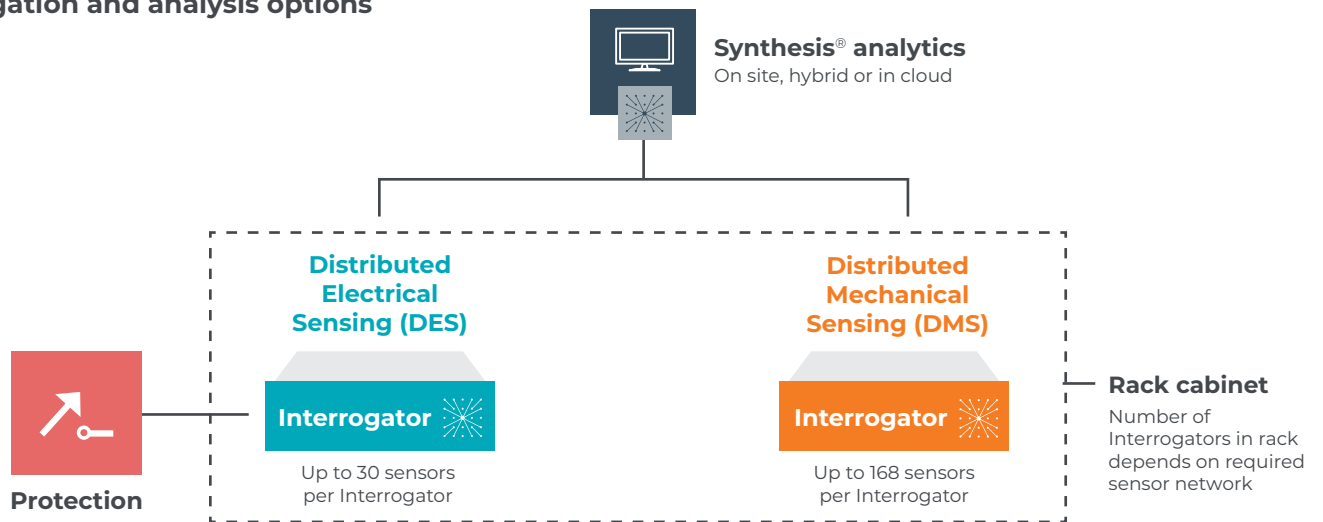


Distributed Mechanical Sensing (DMS) Interrogator

Synaptec Interrogators are the core component in all our monitoring systems, centrally gathering, time-stamping and publishing synchronous data from passive Synaptec sensors. The data can be streamed to existing protection relays and SCADA systems, with Synthesis® providing visualisation and analytics to enable actionable alarms and insights.

Modular and scalable, they fully support any mix of Synaptec’s electrical and mechanical sensors and perform real-time analysis of the performance and condition of power networks.

Interrogation and analysis options



Max sensors per fibre	30	21
Max fibres per Interrogator	1	8
Max publishing rate	14.4 kHz (synchronised waveforms)	1 Hz
Applications	Protection, metering and condition monitoring	Condition monitoring
Supported electrical sensors*	PSC	n/a
Supported mechanical sensors*	PST, OHLS, PTT	PST, OHLS, PTT

* PSC: Passive Secondary Converter, PST: Passive Strain Transducer, OHLS: Overhead Line Sensor, PTT: Passive Temperature Transducer.

The **DES Interrogator** is Synaptec's core, high-performance Interrogator, designed primarily for Distributed Electrical Sensing (DES). The DES Interrogator streams live data in industry standard formats including IEC 61850 Sampled Values or custom data formats, and alarms in GOOSE format.

All measurements are time-synchronised, accurately time-stamped to within a microsecond, and published at up to 14.4 kHz, enabling the system to support a combination of protection, metering, and condition monitoring applications. The DES Interrogator synchronously monitors up to 30 sensors over a 60 km range, processing and streaming waveform data in real time with industry-leading latency and detail.

The **DMS Interrogator** monitors mechanical sensors for temperature, strain and overhead line sag at the slower rate of 1 Hz appropriate for such measurands. Available with up to 8 optical channels, each of which can monitor up to 21 mechanical sensors, the DMS Interrogator enables highly-efficient, highly-multiplexed mechanical condition monitoring for power systems assets.

The uniquely powerful and flexible nature of Synaptec's Interrogators makes them ideal for long-range, multi-point protection, automation, control and condition monitoring applications. Streaming data from DES and DMS Interrogator modules are brought together by Synthesis to provide live system condition visualisation, configurable alarms, performance insights, and decision support for asset managers.

Specifications

	DES Interrogator	DMS Interrogator
Mechanical		
Dimensions	19" 3U rack (447 x 425 x 132 mm)	19" 2U rack (483 x 400 x 88 mm)
Weight	8.3 kg	7 kg
Power supply		
Voltage	100-240 VAC, 110/220 or 48/125 VDC	100 – 240 VAC
Frequency	50/60 Hz	50/60 Hz
Maximum power consumption	90 W	17.5 W
Redundancy	Integrated dual-redundant	Single
Environmental		
Operating temperature	-25 to +55 °C	0 to +50 °C
Storage temperature	-25 to +70 °C	-20 to +70 °C
Humidity	to 93% at +40 °C	to 90% at +40 °C
Shock endurance	15 g (in each axis); 11 ms pulse (IEC 60255-21-2)	20 g (in each axis); 11 ms pulse (IEC 60068-2-27)
Sinusoidal vibration endurance	1g (10 - 150 Hz); 20 cycle/axis (IEC 60255-21-1)	2.5 g (5 to 65 Hz); 30 min/axis (IEC 60068-2-6)
IP rating	IP3X	IP20
Optical input		
Number of optical channels	1	8 (max)
Number of sensors per channel	30 ¹	21 ²
Fibre type	Standard simplex single-mode	Standard simplex single-mode
Interface	SC/APC	FC/APC

¹ Assumes 5P10 class Passive Secondary Converter with operating temperature range -5 °C to +40 °C.

² Assumes Passive Temperature Transducers with operating temperature range -40 °C to +100 °C.

Specifications (continued)

	DES Interrogator	DMS Interrogator
Communications interfaces and IO		
Number of Ethernet ports	6x Gigabit Ethernet	1x Ethernet
Ethernet interface	SFP (user selectable interface type, and included with the Interrogator)	RJ45
Redundancy	IEC 62439-3 PRP	n/a
Protocol(s)	IEC 61850-9-2 "LE", IEC 61869-9, IEC 61850-8-1 (GOOSE), customised datasets	SCPI
Supported sampling rates	4 kHz, 4.8 kHz, 14.4 kHz	1 Hz
Watchdog contact	Normally open (NO) and normally closed (NC) terminals	n/a
Time synchronisation		
Protocol(s)	PTP: IEC/IEEE 61850-9-3 PPS: input and output via optical multimode ST fibre NTP: synchronisation of system clock to a specified NTP server (not suitable for precision synchronisation of waveform samples)	NTP
HMI		
Software configuration and management	Secure web interface – integrated within Interrogator	Secure web interface – integrated within Interrogator
Configuration port	Front panel: RJ45 Gigabit Ethernet	RJ45 Ethernet
Display	2x16 alphanumeric	n/a
LEDs	Indicators for alarms, Ethernet connections, and power	Indicators for power and status
Reference standards		
Environmental/EMC	Product safety per IEC 60255-27 Climatic environment per IEC 60255-1 (IEC 60068-2) Mechanical environment per IEC 60255-1 (IEC 60255-21) EMC per IEC 60255-1 (IEC 60255-26)	IEC 60068-2