SKF Multilog On-line System IMx-8

24/7 condition monitoring to improve machine reliability

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The SKF Multilog On-line System IMx-8, is a powerful solution for condition monitoring applications requiring up to 8-channels, per device. Coupled with SKF software, it provides a complete system for early fault detection and prevention, automatic advice for correcting existing or impending machine conditions and advanced condition based maintenance to improve reliability, availability and performance.

The SKF Multilog IMx-8 packs a high-specification condition monitoring product into a compact form. It offers 8 analogue inputs (constant current accelerometers, voltage inputs) and two digital channels, for speed sensor inputs.

It incorporates RS485 and Ethernet connectivity to provide easy access to the vibration and temperature data and integration with other systems.

The SKF Multilog IMx-8 integrates easily with SKF's Cloud service for data storage, data sharing and for SKF Remote Diagnostic Services.

The SKF Multilog IMx-8 has several industry specific certifications and can be typically used in the following industries:

- Wind energy
- Marine
- Machine Tool
- Process Industries

Features

- No bigger than a paperback novel
- 8 analogue inputs (vibration/process)
- 2 digital inputs (speed)
- Transducer power
- Simultaneous measurements on all channels

- Ethernet connectivity to @ptitude Observer software
- DHCP client, capable

- On board clock calendar
- Supports NTP time synchronisation protocol
- Device time update from app

- Modbus RTU (RS485) link
- Modbus TCP/IP
- Support for simultaneous RTU, TCP/IP and multiple Modbus TCP/IP, use

- 24–48 VDC and/or Power over Ethernet
- Redundant power capability
- Output relay drivers – alarms and system

- Multi-parameter gating
- Multiple SKF enveloping filters

- Data buffering in non-volatile memory when communication is down
- 2 GB used for measurement data

- Integrates to SKF's Cloud service and SKF Remote Diagnostic Services
- Local access via iOS and Android Apps
- Bluetooth
- Multiple industry/environmental approvals:
  - CE
  - WEEE
  - RoHS
  - EMC immunity and emissions

IMx-8 top connectors

DC input power connection

Demountable terminals are provided for the incoming DC power supply.

Pin	Description
+	+24 to +48 V DC
-	0 V DC

The IMx-8 also supports Power over Ethernet (PoE), via the RJ45 connector.

Both potential power sources can be used to provide power redundancy.

USB A Host interface (Type A connector) SKF supply a Bluetooth dongle fitted in USB port A. The dongle supports Bluetooth v4.0 LE, (Low Energy).

USB B Service interface (Type mini-B) SKF can supply an isolated cable for USB port B.

LEDs Pwr – Power (green, normally on) *Sys* – System (red, normally off)

Sw Rescue button (maintenance mode)

Eth (Ethernet)

Ethernet connectivity for a TCP connection to @Observer software (Monitor service) and in addition, will support Modbus TCP/IP.

Connector	RJ45 with two LEDs
Network support	10/100 Mbit/s
DHCP client	Configurable
DNS	server name lookup
NTP	time synchronisation.

Note: The Ethernet connection is isolated from the enclosure and is unrelated to G.

RS485 (2-wire)

Protocol	Modbus RTU
Master/slave mode	Configurable

Pin	Description
RA	RS485 A
RB	RS485 B
G3	GND

SKF provide one 120-ohm RS485 termination resistor (coloured black) with each IMx-8 (CMON 4108) and another as part of CMON 4135.

D1 and D2 (Digital/tacho input connections)

The digital input channels D1 and D2 support common types of two-, three-wire tacho sensors. For each input, 3-terminals are available:

Pin	Description
G1 or G2	GND / Return
D1 or D2	Signal
P1 or P2	Power

Digital sensor power is always enabled to the 'P' terminals. Peak current demand from the sensor should be no greater than the limit stated in the specifications, even if the average demand is less.

Notes:

Demountable terminal connectors

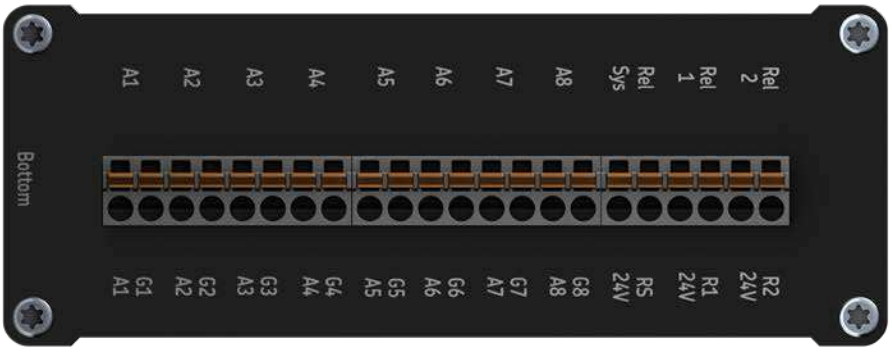
One 11-way (digital) and one 2-way (power) are provided.

Optional items

For optional items and accessories, refer to ordering information.

CAN For vehicle systems interfacing (currently no firmware support)

IMx-8 bottom connectors



A1 to A8 (Analogue inputs 1-8)

Channels A1 to A8 support constant current accelerometers, current or voltage inputs.

Constant current, transducer power is enabled by configuration, on a per channel basis.

Pin	Description
A1 to A8	Signal
G1 to G8	GND / Return

Relay drivers (Digital outputs)

The IMx-8 provides 3 relay driver outputs for system, warning and alarm status indications.

Pin	Description
24V	Relay drive power
RS	System relay output
24V	Relay drive power
R1	Relay 1 output
24V	Relay drive power
R2	Relay 2 output

The RS, R1 and R2 connections are of a type known as 'open collector' or 'open drain'. The system relay (RS) is failsafe (alarms on loss of power), R1 and R2 are non-failsafe.

Notes:

Demountable terminal connectors

Two 8-way (A1 to A4, A5 to A8) and one 6-way (Relay drivers) are provided.

Current signals

When connecting a 4-20 mA current signal to an analogue input an external load resistor is required. SKF provide a set of 250-ohm load resistors (coloured blue), as part of CMON 4135.

Specifications

Hardware

Power Input	13 W, 24–48 V DC (±5%). Recommended supply fuse: 2 A slow blow (T2AL) The power input connections are isolated from GND / chassis
Power over Ethernet	PoE can be used instead of or redundantly with the 24–48 V DC input Nominal voltage 48 V, 13 W maximum
Analogue inputs	
Quantity	8 (A1 to A8)
Input type	Non-isolated, referenced to chassis/enclosure ground
Input range	Functionally: ±25 V (±28 V without damage)
Impedance	>100 kΩ
Supported sensor types	2-wire: Constant current accelerometers Voltage signals 4-20 mA signals (load resistor to be fitted at the IMx input)
Analogue sensor power	4 mA constant current per sensor Individually software enabled/disabled for each sensor Sensor power has short circuit protection
Sensor and cable fault detection	Automatic – software configurable
Analogue/Digital conversion	24 bit (one A/D converter per channel)
Dynamic range	120 dB
Signal to noise ratio	90 dB
Digital inputs	
Quantity	2
Input type	Non-isolated, referenced to chassis/enclosure ground
Input range	Functionally: positive voltages up to 24 V (+27 V without damage)
Trigger level	2,9 V, Hysteresis 0,1 V
Impedance	1,6 kΩ
Supported sensor types	2- and 3-wire, including: PNP sensors Pulse signals (TTL to pulses with peak voltages up to +24 V) On-line oil debris sensor (Gastops MetalSCAN)
Digital sensor power	24 V DC. Maximum, peak demand up to 30 mA per sensor Sensor power always enabled (available on a dedicated terminal) Sensor power has short circuit protection
Digital Outputs	
Relay driver outputs	3 relay drivers (24 V DC) 2 for measurement alarming and 1 for system alarming Total maximum drive current available: 70 mA Minimum individual coil resistances: 345 Ω (1 relay) 690 Ω (2 relays) 1 035 Ω (if 3 relays are in use)
Physical and environmental	
Mounting	DIN-rail (35 mm × 7,5 mm 'top hat' DIN rail)
Size (H is across the rail)	Size (H × W × D): 172[A] × 104 × 40[B] mm *(6.8 × 4.1 × 1.6 in.)* A: Height (H) does not include terminal connectors and Bluetooth dongle B: Depth (D) is unmounted and excluding DIN-rail mounting bracket
Weight	410 g *(0.9 lb)*
IP rating	IP 30 (IP65 SKF cabinet available)
Operating temperature range	–40 to +70 °C *(–40 to +158 °F)*
Storage temperature range	–50 to +85 °C *(–58 to +185 °F)*
Humidity	95% (relative) non-condensing
Pollution degree	2
Maximum altitude	2 000 m *(6 562 ft)*
Measurement category	Cat II
Vibration tolerance	4 – 13,2 Hz 1 mm 13,2 – 100 Hz 0,7 g Number of axes: 3 mutually perpendicular.
Connectors	Removable terminal blocks with spring terminals The use of bootlace ferrules sized at 1,5 mm² / 16 AWG is recommended System specific connectors are used for LAN and USB connections

Specifications cont.

Measurement capabilities

Analogue channels	
Frequency range	DC to 40 kHz
Maximum sampling frequency:	102,4 kHz
Crosstalk rejection	–110 dB at 1 kHz
Vibration measurement accuracy	Amplitude: ±2% (up to 20 kHz), ±5% (20 to 40 kHz) Phase: ±3° (up to 100 Hz)
Measurement types	
Overall	Acceleration, velocity, acceleration enveloping (gE*) *SKF enveloping filters 1 to 4, for bearing damage detection Optional high-pass (AC) filter, selectable cut-offs
Detection	RMS, true peak and peak-peak
FFT resolution	100 to 6 400 lines, integration/differentiation in the frequency domain
FFT window function	Hanning
Time waveform (TWF)	256 to 16 384 points (equivalent to FFT lines above)
Acquisition types	Fixed frequency range or order tracking
Synchronous measurements	Configurable across (up to) all 8-channels
Alarm capabilities	
Overall value	Warning and alarm (window), scalar or vector (circular, amplitude/phase) Adaptive alarming Alarm group support
Other measurement types	
Modbus external channels	32 Modbus holding registers available
IMx derived points	Calculated values based on measurement data
Digital channels	
Frequency range	From 0,016 Hz to 20 kHz *(1 cpm – 1,2 Mcpm)* When used for order tracking, maximum pulse frequency is 2,5 kHz
Speed accuracy	0,05% of measurement value (typically 0,01% up to 2,5 kHz)
Other capabilities	Pulse counting Configurable pulses per rev. The product of pulses per rev and rotational speed is subject to the maximum frequency range, limitation.
System Interfaces	
IMx-8 top connectors	Ethernet LAN, CAN and RS485 USB A dongle provides: Bluetooth v4.0 LE (Low Energy) USB B Service interface (Type mini-B)
Supported protocols	
RS485	Modbus RTU
Ethernet	Modbus TCP/IP, IEC 61850 MMS* *an automation standard for communications networks in a sub-station environment
Measurement data storage	
Modes	Data storage on time, associated measurement value (gating) or alarm condition Measurements linked to speed data (when available) Transient data capture Event capture trigger mode: Manual, Event, Run cycle
Data time stamping support	Internal clock calendar (backup power capacitor for about 1 week) (S)NTP time synchronisation protocol Device time can also be set from the companion app.
On-board/internal buffering	4 GB (non-volatile/Flash memory): 1 GB for trend and dynamic 1 GB for event capture and run cycles 2 GB reserved
Self-diagnostics	
Built-in	Automatic hardware monitoring and diagnosis (watchdog and self-testing)
Remote access	Hardware, firmware identification and status information

Specifications cont.

Software/database/App support

Main software	SKF @ptitude Observer
Software capabilities	Measurement configuration, data storage, assessment, analysis, reporting Automatic (IMx-8 device) firmware update
Supporting software tool	SKF @ptitude Observer On line device configurator
Tool capabilities	Network configuration
Supporting software	SKF Multilog IMx Manager Apps for iOS and Android
App capabilities	Network configuration Measurement configuration SAT (Site Acceptance Test) and installation support Firmware update Report generation and data viewer Set device time/date

Data repositories

Customer specific repository	Machine (asset) templates Network configurations Firmware
Customer security/protection	IMx devices and repository users are associated only to specific companies Data is encrypted

Certifications and type approvals

CE directive	EMC Directive 2014/30/EU
EMC Emissions	EN 61000-6-4:2007/A1:2011
EMC Immunity	EN 61000-6-2:2005
DNV GL Renewables	GL-IV-4:2013, Guidance for the Certification of Condition Monitoring Systems for Wind Turbines
DNV GL Marine type	DNV No 2.4:2006, Location class: “All locations except bridge and open deck” EMCA
ABS Marine type	ABS Part 4:2011, chapter 9, section 7, table 9 and 10, Installation class: “General power distribution zone” (Pending)
Lloyd’s Register Marine type	Lloyd’s Register, Test Specification No 1, July 2013, Equipment in general power distribution zones

Ordering information

Part Number	Description
CMON 4108	SKF Multilog IMx-8
CMON 4133	Mini USB cable (isolated) for IMx-8/IMx-16Plus
CMON 4134	SKF Bluetooth dongle for IMx-8/IMx-16Plus
CMON 4135	Set of double deck connectors and resistors for Modbus termination, 4-20 mA inputs and PT1000 inputs* for IMx-8/IMx-16Plus
CMON 4136	Analogue isolator module (4-20 mA to voltage) for IMx-8/IMx-16Plus
CMON 4137	DIN rail mounted power supply for IMx-8/IMx-16Plus
CMON 4150	IP65 cabinet with pre-drilled holes for IMx-8/IMx-16Plus
CMON 4151	IP65 cabinet without pre-drilled holes for IMx-8/IMx-16Plus

*PT1000 inputs are only supported by the IMx-16Plus and the associated resistors (coloured red) are required for a SAT test.

For installation and training services, contact your local SKF supplier or representative.

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