The Multilog Condition Monitoring Unit (CMU)

A round-the-clock surveillance system to improve machine reliability

SKF introduces it's next generation on-line surveillance system. The Multilog Condition Monitoring Unit (CMU) along with the SKF Machine Analyst On-Line Systems and SKF Machine Analyst /HMI software, provide a powerful solution for improving plantwide reliability. First introduced in 1987, the Multilog is today's leading on-line surveillance system, with an installed base of more than 50,000 channels monitoring machinery in a range of industries around the globe.

FEATURES

- *Microsoft embedded Win CE*

- *Multi-parameter monitoring for identifying a range of machine problems*

- *Large capacity and non-volatile memory preserves critical machine detail in the event of a loss of power*

- *Distributed processing for enhanced system reliability*

- *Ethernet or SKF proprietary RS-485 communications*

- *Modular channel options*

- *Ruggedized construction for optimum performance in the harshest environments (IP 65 Rated)*

- *Versatile platform for the addition of future capabilities including two channel analysis*

The Multilog Condition Monitoring Unit (CMU) enables round-the-clock data acquisition from plant machinery in any industrial or process environment. The CMU collects and evaluates vibration and process machinery data from permanently installed sensors, then automatically captures alarms as they occur. It records data on a scheduled basis, making problem detection and analysis on key assets timely, reliable and efficient. Specially designed to perform in harsh, remote, unsafe or difficult to reach locations, the CMU automatically records and processes machine data and alerts a user to incipient machine problems.

Machine information is transmitted via an Ethernet or SKF LAN Plus connection to a host computer running the SKF Machine Analyst for On-Line Systems software. Once installed, the system is configured via the software on any networked PC- even while the system is on-line. With the complete SKF Multilog On-Line surveillance system solution, users spend less time collecting data and more time on the analysis and diagnosis of machine problems.

MODULAR ARCHITECTURE WITH BUILT-IN FLEXIBILITY

The CMU is a modular and scaleable solution that easily meets your current operational and budgetary needs, then grows along with your reliability program. Start with as few as 4 channels and expand as needed. Multi-parameter, tachometer, digitial IO, and direct access modules allow you to further expand or customize the CMU to your plant's unique monitoring requirements. Up to 32 static or dynamic sensor inputs, 8 tachometer signal inputs and 16 digital logic inputs can be connected to the CMU.

When it's time to grow your program, the CMU is easy to expand. From a single unit of 4 to 32 channels, to 63 CMU's monitoring 2016 channels and 16, 128 measurement points, the Multilog system can be tailored to fit any size program.

SKF Reliability Systems

SKF

SYSTEM RELIABILITY AND PERFORMANCE

Each CMU collects and evaluates data internally and functions independently of other units. Once configured, it does not rely on the host computer for data collection. This distributed processing and alarm evaluation helps to ensure the utmost in system reliability and performance and eliminates the bottlenecks that occur when data processing occurs only in the software.

INTEGRATED PLATFORM

A powerful combination for round-the-clock machinery monitoring, the complete on-line monitoring system combines the strength of the Condition Monitoring Unit data acquisition device with the analytical power of the SKF Machine Analyst for On-Line Systems software. With user-defined data displays and the capability to view multiple plots simultaneously, the program frees a user to approach analysis according to personal preferences with complete control over workspace and analysis tools.

SKF Machine Analyst for On-Line Systems provides the platform for versatile trending and powerful analysis of collected data. The software is multi-tasking, so the CMU continues to collect and process data and you are notified of alarm conditions even while using the system for analysis.

Additional diagnostic capabilities offer you the option to view measurement data just seconds after it is acquired. Extensive event log, reporting functions and database management tools allow you to closely track machine problems, determine the need for maintenance or recreate events that led up to the current condition.

SKF Machine Analyst is the core platform in the SKF Machine Analyst Suite which also supports the Microlog line of portable data collectors/analyzers from SKF, the Diagnostic Instruments line of data collectors, and the MARLIN line of personal data assistants for Operator Driven Reliability. Now plants can benefit from a single program that provides the range of analysis and diagnostic tools to facilitate teamwork, and consistent and reliable decision making across functional lines.

STANDARD AND CUSTOM COMMUNICATIONS PROTOCOLS

The CMU can be linked to the host computer using SKF's RS-485 communication link or through Ethernet. This means users can take advantage of existing cabling whether it be Ethernet or SKF's RS-485 Lan used by the Local Monitoring Units. Or, you may wish to consider an alternative connection such as fibre optics or even wireless.

HIGH PERFORMANCE IN HARSH ENVIRONMENTS

The IP 65 rated enclosure is dust tight and water stream protected. This means the CMU can be installed in the harshest of locations in close proximity to the monitored machine, minimizing cabling costs and ensuring measurement quality.

Industrial-grade electronics in the CMU are also rated for greater tolerance in high temperature environments. This results in greatly improved component and unit reliability overall and ease of installation because there is no need for ancillary equipment such as fans for additional cooling.

ADVANCED MEMORY AND AUTO-RECOVERY OF MACHINE DATA

The CMU unit now contains a large capacity memory which enables the capture of more machine data. Each of the CMU's 32 channels can take multiple measurement configurations (points) to support multi-parameter monitoring. The CMU can support up to 256 measurement points with 5 measurements (FFT and time-waveform) per downloaded point (based on 800 lines of resolution for dynamic data), as well as over 500 alarm measurements. Alarms and point set-ups are stored in non-volatile memory in each CMU. This ensures the preservation of critical machine information in the event of a power loss. An auto-recovery feature automatically resumes system operation after a temporary power loss. (No user intervention required.)

MONITOR HIGH FREQUENCY APPLICATIONS

An Fmax at 40 kHz provides a significant analysis bandwith that enables monitoring of high-frequency applications such as high speed spindles, specialized pumps, gearboxes and more.

FAST, ACCURATE AND RELIABLE DETECTION OF MACHINE AND COMPONENT PROBLEMS

The CMU provides up to 12,800 lines of resolution, providing the analyst with the ability to more clearly distinguish problems where frequencies are in close proximity, or longer time samples when observing and analyzing complex events. A 96 dB Dynamic range makes it possible to discern even the smallest signal amid accompanying machine noise.

MULTI-PARAMETER CAPABILITIES FACILITATE ENHANCED ANALYSIS

The capability for multi-parameter monitoring in the CMU adds tremendous value to the on-line solution. Monitor vibration, temperature and a range of process parameters to better understand the machine's failure development.

Use advanced techniques like acceleration enveloping, widely recognized in industry as the most accurate and reliable method of detecting rolling element bearing damage. SKF utilizes multiple filters covering the entire measurement bandwidth to ensure effectiveness at low, medium and high speeds.

The technology also makes it possible to detect gear damage and unique problems related to special functions on industry-specific plant machinery for example – felt barring, press roll flat spots and more in paper, or chatter in the steel industry.

COST-EFFECTIVE INSTALLATION ALTERNATIVES

The CMU simplifies and reduces the costs associated with installation when using standard eddy probes which can be powered directly from the unit – without the need for a separate power supply.

COMMUNICATION WITH PLANT SYSTEMS

With 16 digital inputs, the CMU easily determines the operational state of a monitored machine from external sources such as a PLC, to enable logic gating. A special gating mode (pre-emptive) allows data capture even in applications with a short (few seconds) window of opportunity for measurements. This capability makes it possible to automate data collection according to a specific function, change in machine speed or other relevant condition. This is a requirement for machine tool spindle monitoring and stamping presses.

SERVICE AND SUPPORT

With local offices in more than 130 countries around the world, SKF is poised to provide the support you need to implement a results oriented program from the start. We offer a range of reliability maintenance services and products and nearly 100 years of applications expertise in a range of industries. Contact SKF Reliability Systems for help in designing a blueprint for reliability success and bottom line cost savings in your plant.

TECHNICAL SPECIFICATIONS

DATA ACQUISITION AND EVALUATION

Vibration Acceleration, Velocity, and Displacement: Includes hardware integration (single) or software integration (double)

Acceleration Enveloping: Four (4) filter ranges

Velocity Enveloping: Four (4) filter ranges

FFT, Time and Phase

Averaging: Standard, Synchronous Time, Peak-Hold

Parametric Gating: Data acquisition based on other measured parameters

Logic Gating: Triggered and pre-emptive

Alarms: Overall, spectrum envelope, band, speed following band, phase

Pressure: Static and Dynamic

Speed: From tacho, programmable pulses/rev

4-20 mA Inputs

Temperature: Proportional DC with programmable units and offset

Static Measurements: User programmable units

MULTI-PARAMETER MODULE

Number of Inputs: 32 maximum (multiplexed)

Total Dynamic Range: 140 dB

Measurement S/N Ratio: 96 dB (tested)

Voltage Range: 20 mVpp to 40 Vpp (centered around zero)

Current Input: 4-20 mA

Input Frequency Range: DC to 40 kHz

Low Frequency Cut Off Filter: Fixed ranges from 0.16 Hz to 70 Hz

Lines of Resolution: 100, 200, 400, 800, 1600, 3200, 6400, 12800

Input Protection: 440 volt

Sensor Power: 4 mA at 24 Vdc for seismic sensors.
-24 Vdc for displacement probes.

Sensor Validation Measurement: Parallel BOV or gap measurement

TACHOMETER MODULE

Number of Inputs: 8 (multiplexed)

Power Provision For External Tacho Device: A single +12 Vdc at 500 mA for all 8 tachos

Frequency Range: 10–60,000 RPM ±1% (as actually seen on the tacho input).

Voltage Range: 2 Vpp to 30 Vpp

Trigger Level: Automatic

DIGITAL INPUTS

Number of Inputs: 8 or 16

Voltage Range: TTL compatible 0 to 5 Volt.

Visual Indicators: LED for each input which is lit when "high".

AMPLITUDE DEVIATION

Acceleration/Velocity/Displacement:
$< \pm 5\%$

BOV: $< \pm 5\%$ on 20 VDC scale

Gap: $< \pm 0.1\%$ of full-scale (fs = 20 V)

Temperature: $< \pm 1\%$ of full scale value

Process Parameter: $< \pm 1\%$ of full scale value (fs = 10 V)

SIZE

Dimensions: 23.6" (600 mm) wide x 23.6" (600 mm) high x 8.4" (210 mm) deep in stainless steel IP 65 weatherproof enclosure

Weight: Approximately 70 lbs. (32 kg)

ENVIRONMENTAL

IP 65: Dust tight and water stream protected

Operating Temperature: 0 to +130°F (-20 to +55°C)

Humidity: To 95% relative humidity condensing.

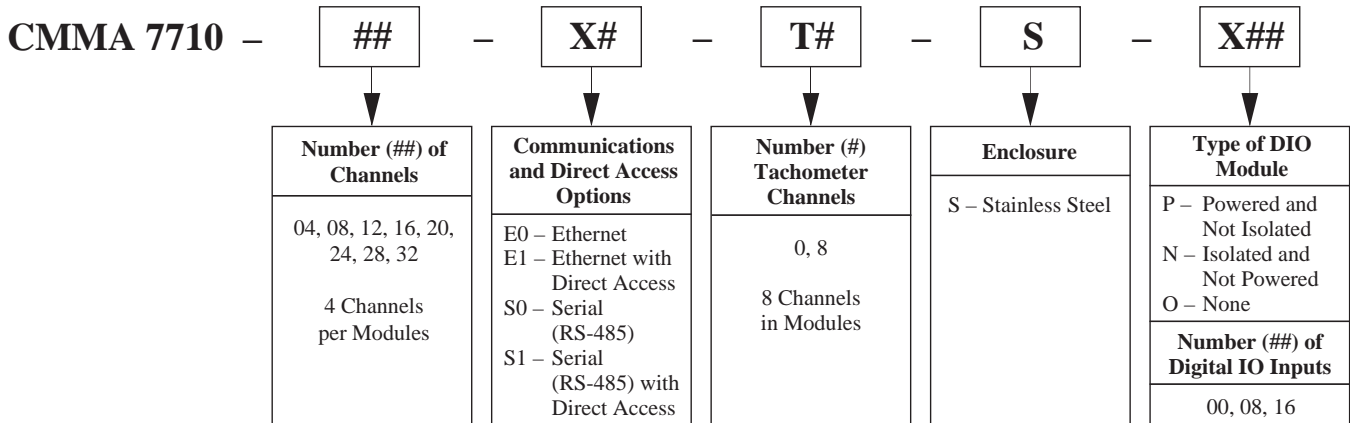**Certifications:** CE, CSA

NETWORK

- 10-BaseT Ethernet
- SKF Proprietary (230 kbaud) RS-485
- Up to 63 devices per network

HOST SOFTWARE – MACHINE ANALYST

- Run on either Windows XP or Windows 2000.
- Can be installed in client/server configuration for shared access.
- Uses an Oracle database for maximum performance and reliability
- Machine Analyst also supports SKF Microlog and MARLIN SKF Condition Monitoring products.
- Compatible with @ptitude Decision Support Software and SKF Machine Analyst /HMI software.

The Multilog Condition Monitoring Unit (CMU)

ORDERING INFORMATION

CMMA 7710 – ## – X# – T# – S – X##

Number (##) of Channels	Communications and Direct Access Options	Number (#) Tachometer Channels	Enclosure	Type of DIO Module
04, 08, 12, 16, 20, 24, 28, 32 4 Channels per Modules	E0 – Ethernet E1 – Ethernet with Direct Access S0 – Serial (RS-485) S1 – Serial (RS-485) with Direct Access	0, 8 8 Channels in Modules	S – Stainless Steel	P – Powered and Not Isolated N – Isolated and Not Powered O – None

				Number (##) of Digital IO Inputs
				00, 08, 16

PRE-CONFIGURED MODELS

CMMA 7710-32-E0-T8-S-000 Multilog CMU System, 32 channels, Ethernet Communications, No Direct Access, 8 Tachometer Inputs, Stainless Steel enclosure, No Digital Inputs.

CMMA 7710-16-E0-T8-S-000 Multilog CMU System, 16 channels, Ethernet Communications, No Direct Access, 8 Tachometer Inputs, Stainless Steel enclosure, No Digital Inputs.

CMMA 7710-32-S0-T8-S-000(*) Multilog CMU System, 32 channels, SKF RS-485 communications, No Direct Access, 8 Tachometer Inputs, Stainless Steel enclosure, No Digital Inputs.

CMMA 7710-16-S0-T8-S-000(*) Multilog CMU System, 16 channels, SKF RS-485 communications, No Direct Access, 8 Tachometer Inputs, Stainless Steel enclosure, No Digital Inputs.

(*) Contact factory for availability.

CUSTOM CONFIGURATION

CMMA 7710-00-E0-T0-S-000 Multilog CMU Base unit, zero channels, Ethernet Communications, No Direct Access, zero Tachometer Inputs, Stainless Steel enclosure, No Digital Inputs.

CMMA 7710-32-S0-T8-S-000(*) Multilog CMU Base unit, zero channels, SKF RS-485 communications, No Direct Access, zero Tachometer Inputs, Stainless Steel enclosure, No Digital Inputs.

EXPANSION MODULES

CMMA 7710-MP Multi-parameter Module, 4 channel (Maximum 8 per CMU).

CMMA 7710-TACH Tachometer Module, 8 channel (Maximum 1 per CMU).

CMMA 7710-DION Digital Input Module, 8 Inputs (Maximum 2 per CMU).

CMMA 7710-DIOP Digital Input Module, 8 Inputs (Maximum 2 per CMU). Non-isolated with self powered inputs.

CMMA 7710-DA Direct Access/Manual Data Collection Module (Maximum 1 per CMU). Isolated inputs.

CERTIFIED
ISO 9001:2000

MGMT. SYS.
RvA C 050

Accredited by the Council
for Accreditation (RvA)

INTERTEK CERTIFICATION

ANSI · RAB
QMS
ACCREDITED
National Accreditation
Program

SKF Reliability Systems – ISO 9001:2000/ ISO 14001 Certified

LLOYDS REGISTER QUALITY ASSURANCE
ISO 14001

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