SKF Multilog On-line System WVT

CMWA 7910

User Manual Part No. 32311900-EN
Revision A

> ⚠ ***WARNING! Read this manual before using this product. Failure to follow the instructions and safety precautions in this manual can result in serious injury, damage to the product, or incorrect readings. Keep this manual in a safe location for future reference.***

5271 Viewridge Court., San Diego, CA 92123-1841 USA
Telephone: (858) 496-3400, Fax: (858) 496-3531
Customer Service: 1-800-523-7514

SKF USA Inc.

Patents: US 4,768,380 • US 5,633,811 • US 5,679,900 • US 5,845,230 • US 5,852,351 • US 5,854,553 • US 5,854,994 • US 5,870,699 • US 5,907,491 • US 5,992,237 • US 6,006,164 • US 6,124,692 • US 6,138,078 • US 6,199,422 • US 6,202,491 • US 6,275,781 • US 6,301,514 • US 6,437,692 • US 6,489,884 • US 6,513,386 • US 6,633,822 • US 6,789,025 • US 6,792,360 • US 7,103,511 • US 7,697,492 • WO/2003/048714

Product Support – Contact Information

Product Support – To request a Return Authorization, Product Calibration or a Product Support Plan, use the web page links for direct contact and support.

Product Sales - For information on purchasing condition monitoring products, services or customer support, contact your local SKF sales office.

General Product Information

For general product information (i.e., product data sheet, accessories catalog, etc.), visit the Condition Monitoring Products page on SKF.com and select the appropriate product link.

Technical Support Group

Discuss/review issues of specific interest with maintenance and reliability specialists from around the world at the SKF Knowledge Centre.

For technical support on issues like troubleshooting product installation, troubleshooting product performance, etc., use our technical support web page to contact one of our Technical Support Groups.

Product Registration

Please take a moment to register your product at www.skf.com/cm/register to receive exclusive benefits offered only to our registered customers, including receiving technical support, tracking your proof of ownership, and staying informed about upgrades and special offers. (Please visit our website for more details on these benefits.)

Tell us how we're doing!

It's important that you're satisfied with the quality of our product user manuals. We appreciate your feedback; if you have comments or suggestions for improvement, please tell us how we're doing!

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SKF USA Inc. – Limited Warranty

WARRANTY

Subject to the terms and conditions contained herein, SKF warrants to the Buyer that for the warranty period indicated below the products sold by SKF that are listed below (the "Products"), when properly installed, maintained and operated, will be free from defects in material and workmanship and shall be fit for the ordinary purposes for which the Products are designed.

BUYER'S LIMITED REMEDIES

This limited warranty defines SKF's sole and exclusive liability and Buyer's sole and exclusive remedy for any claim arising out of, or related to, any alleged deficiency in any Product sold by SKF, even if such claim is based on tort (including negligence or strict liability), breach of contract, or any other legal theory. If the Product does not conform to this limited warranty, Buyer must notify SKF or SKF's authorized service representative within thirty (30) days of discovery of the nonconformity; provided, however, that SKF shall not be liable for any claim for which notice is received by SKF more than thirty (30) days following the expiration of the applicable warranty period for the Product. Upon receipt of timely notification from Buyer, SKF may, at its sole option, modify, repair, replace the Product, or reimburse Buyer for any payment made by Buyer to SKF for the purchase price of the Product, with such reimbursement being pro-rated over the warranty period.

WARRANTY PERIOD

Except as expressly provided below, the warranty period for each Product shall commence on the date the Product is shipped by SKF to Buyer.

90-DAY WARRANTY

Products warranted for ninety (90) days by SKF are as follows: cable assemblies, MARLIN QuickConnect (MQC), magnetic temperature probes, and all refurbished equipment.

ONE-YEAR WARRANTY

Products warranted for one (1) year by SKF are as follows: all Microlog products and accessories, all Microlog Inspector applications including hand-held computers, all MARLIN data managers (MDM), all MARLIN Condition Detectors (MCD), all Wireless Machine Condition Detectors (WMCD), all Multilog On-line Systems (IMx), all Multilog Condition Monitoring Units (CMU, TMU), Multilog Local Monitoring Units (LMU), all Multilog Wireless Monitoring Units (WMx), Multilog On-line System Wireless Vibration Transmitter (WVT) ISA100, all Wireless Monitoring Systems V/T, all Vibration PenPlus, all Machine Condition Advisors (MCA), all Machine Condition Indicators (MCI), all transmitters, all Monitor Interface Modules (MIM), all Machine Condition Transmitters (MCT), all MicroVibes and Custom Products with the prefix of CMCP (with the exception of any consumable or expendable items), Shaft Alignment Systems TKSA 60 and TKSA 80 including hand-held computer, measuring units and accessories.

TWO-YEAR WARRANTY

Products warranted for two (2) years by SKF are as follows: all standard Eddy Probes, Eddy Probe Drivers, and Eddy Probe Extension Cables, all Multilog On-line Systems (DMx), all Wireless Machine Condition Sensors, and all M800A and VM600 Machinery Monitoring Systems.

For all On-line Systems that have satisfied Criteria 1 and 2 below, the warranty period shall be either thirty (30) months from the date the On-line System is shipped by SKF to Buyer, two (2) years from the date the On-line System is installed and commissioned by SKF, or two (2) years from the date on which the installation of the On-line System has been audited and commissioned by SKF or its authorized service representative, whichever period ends first.

Criteria 1.

Devices used with a Multilog On-line System (IMx), Multilog Condition Monitoring Unit (CMU), Multilog Local Monitoring Unit (LMU), including, but not limited to, the sensing device, the interconnect cabling, junction boxes, if any, and the communications interface, must consist only of SKF-supplied or SKF-approved devices and/or components. The computer provided by Buyer must meet the requirements stipulated by SKF.

Criteria 2.

SKF or its authorized service representative has installed the On-line System or has audited the installation and commissioned the On-line System.

"On-line Systems" are defined as systems consisting of Multilog On-line System (IMx), Multilog Condition Monitoring Unit(s) (CMU), Multilog Local Monitoring Unit(s) (LMU), and any sensing or input devices, the interconnect cabling between the sensing or input devices and the Multilog On-line System (IMx), Multilog Condition Monitoring Unit(s) (CMU), Multilog Local Monitoring Unit(s) (LMU), and the cabling between the Multilog On-line System (IMx), Multilog Condition Monitoring Unit (CMU), Multilog Local Monitoring Unit (LMU) and the proprietary SKF communications interface with the host computer.

FIVE-YEAR WARRANTY

Products warranted for five (5) years by SKF are as follows: special seismic sensors.

LIMITED LIFETIME WARRANTY

Products covered under this Limited Lifetime Warranty (as set forth below) are as follows: standard seismic sensors of the CMSS 2XXX and CMSS 7XX series (accelerometers and velocity transducers) as marked and published in the SKF Vibration Sensor Catalogue.

(A) Subject to the terms herein, SKF will provide a "Limited Lifetime Warranty" for the products specified above sold by SKF USA Inc. after April 15, 2014. Under the Limited Lifetime Warranty, those products shall, at the time of shipment, be free from defects in material and workmanship. If any of these products fail to meet the terms of this Limited Lifetime Warranty during the life of such products, SKF USA Inc., in its sole discretion, will repair, replace or exchange the products for the same model if the necessary components for the products are still available to SKF USA Inc. on a commercially reasonable basis. SKF USA Inc. will not provide a Limited Lifetime Warranty on products damaged by accident, abuse, misuse, neglect, improper installation, problems with electrical power, natural disaster, or by any unauthorized disassembly, repair or modification.

(B) Upon receipt of any product covered by the Limited Lifetime Warranty, SKF USA Inc. will pay all shipping charges to send the repaired, replaced or exchanged product to the original point of shipment. SKF USA Inc. reserves the right to decline repair or replacement if no fault is found in the product.

(C) For any warranty claim, the original Buyer must provide SKF USA Inc. with the applicable model and serial numbers, the date of purchase, the nature of the problem, and proof of purchase. SKF USA Inc., in its sole discretion, will determine if the Buyer must return the product covered under this warranty to SKF USA Inc.

(D) The express warranty set forth in the Limited Lifetime Warranty is in lieu of and excludes any and all other warranties express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

(E) SKF USA Inc.'s sole obligations under this Limited Lifetime Warranty are set forth in paragraphs (A) and (B), and SKF USA Inc.'s liability under this Limited Lifetime Warranty shall not exceed the purchase price of the product, plus any shipping and handling charges that SKF USA Inc. may be obligated to pay pursuant to paragraph (B).

(F) **IN NO EVENT SHALL SKF USA INC. BE LIABLE OR OBLIGATED TO THE BUYER OR ANY OTHER PERSON FOR SPECIAL, EXEMPLARY, PUNITIVE, INCIDENTAL, DIRECT, INDIRECT, GENERAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BY WAY OF EXAMPLE ONLY, LOST PROFITS OR SAVINGS, LOSS OF BUSINESS OR LOSS OF USE) OR ANY OTHER LOSS, COST OR EXPENSE IN CONNECTION WITH THE PRODUCTS REGARDLESS OF WHETHER OR NOT ANY OF THE FOREGOING WERE FORESEEABLE OR THAT SKF USA INC. WAS ADVISED AS TO THE POSSIBILITY OF SUCH DAMAGES, LOSS, COST, OR EXPENSE.**

(G) The Limited Lifetime Warranty applies solely to the original Buyer and is non-transferrable.

OTHER SKF PRODUCTS

Any SKF product supplied hereunder but not covered by this limited warranty shall be either covered by the applicable SKF limited warranty then in place for such product or, if no such warranty exists, shall be covered by the 90-day warranty stated above.

THIRD PARTY PRODUCT WARRANTIES

For any third party products sold to Buyer by SKF, SKF will transfer to Buyer any warranties made by the applicable third party product vendor to the extent such warranties are transferable.

CONDITIONS

As a condition to SKF's warranty obligations hereunder and if requested or authorized in writing by SKF, Buyer shall forward to SKF any Product claimed by Buyer as being defective. Buyer shall prepay all transportation charges to SKF's factory or authorized service center. SKF will bear the cost of shipping any replacement Products to Buyer. Buyer agrees to pay SKF's invoice for the then-current price of any replacement Product furnished to Buyer by SKF, if the Product that was replaced is later determined by SKF to conform to this limited warranty.

SKF shall not be obligated under this limited warranty or otherwise for normal wear and tear or for any Product which, following shipment and any installation by SKF (if required by the contract with the Buyer), has, in SKF's sole judgment, been subjected to accident, abuse, misapplication, improper mounting or remounting, improper lubrication, improper repair or alteration, or maintenance, neglect, excessive operating conditions or for defects caused by or attributable to the Buyer, including without limitation Buyer's failure to comply with any written instructions provided to Buyer by SKF.

SKF shall be free to conduct such tests, investigations and analysis of the Products returned to SKF, as it deems reasonable and proper in the exercise of its sole judgment. As a further condition to SKF's obligations hereunder, Buyer shall offer its reasonable cooperation to SKF in the course of SKF's review of any warranty claim, including, by way of example only, Buyer's providing to SKF any and all information as to service, operating history, mounting, wiring, or re-lubrication of the Product which is the subject of the Buyer's warranty claim.

EXCEPT WARRANTY OF TITLE AND FOR THE WARRANTIES EXPRESSLY SET FORTH IN HEREIN, IT IS UNDERSTOOD AND AGREED THAT:

(A) SKF MAKES NO OTHER WARRANTY, REPRESENTATION OR INDEMNIFICATION, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT;

(B) IN NO EVENT SHALL SKF BE LIABLE OR OBLIGATED FOR SPECIAL, EXEMPLARY, PUNITIVE, INCIDENTAL, DIRECT, INDIRECT, GENERAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BY WAY OF EXAMPLE ONLY, LOST PROFITS OR SAVINGS, LOSS OF BUSINESS OR LOSS OF USE) OR ANY OTHER LOSS, COST OR EXPENSE IN CONNECTION WITH THE PRODUCTS AND RELATED SERVICES, IF ANY, PROVIDED BY SKF, AND THIS DISCLAIMER SHALL EXTEND AS WELL TO ANY LIABILITY FOR NONPERFORMANCE CAUSED BY SKF'S GROSS OR ORDINARY NEGLIGENCE, AND IN ALL CASES REGARDLESS OF WHETHER OR NOT ANY OF THE FOREGOING WERE FORESEEABLE OR THAT SKF WAS ADVISED AS TO THE POSSIBILITY OF SUCH DAMAGES, LOSS, COST, OR EXPENSE; AND

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The exclusive remedies provided in this limited warranty shall not be deemed to have failed of their essential purpose so long as SKF is willing and able to perform to the extent and in the manner prescribed in this limited warranty.

CM-F0001 EN
Revision X, March 2015

End-User License Agreement

THIS END-USER LICENSE AGREEMENT (this "Agreement") is entered into by and between SKF USA Inc. and/or SKF Condition Monitoring Center AB (hereinafter referred to collectively as the "Licensor") and any person or business that executes this Agreement by clicking the "I agree" icon at the end of this Agreement or by accessing, using, or installing the Software ("Licensee" or "You"). Licensor and Licensee shall be referred to collectively in this Agreement as the Parties.

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(b) Effective Date. The term "Effective Date" shall mean the date on which Licensee assents to the terms of this Agreement by clicking the "I agree" button at the bottom of this Agreement.

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(d) Person. The term "Person" shall mean an individual, a partnership, a company, a corporation, an association, a joint stock company, a trust, a joint venture, an unincorporated organization, or a governmental entity (or any department, agency, or political subdivision thereof).

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(a) Term. This Agreement shall commence on the Effective Date and shall continue in existence until it is terminated in accordance with Section 9(b) below.

(b) Termination. Licensor may terminate this Agreement and the license conveyed hereunder in the event that Licensee breaches any provision, term, condition, or limitation set forth in this Agreement, including but not limited to the license restrictions set forth in Section 2(d) of this Agreement.

(c) Effect of Termination. Within ten (10) days after termination of this Agreement and the license granted hereunder, Licensee shall return to Licensor, at Licensee's expense, the Software and all copies thereof, and deliver to Licensor a certification, in writing signed by an officer of Licensee, that all copies of the Software have been returned to Licensor and that Licensee has discontinued its use of the Software.

10. ASSIGNMENT

Licensee shall not assign or otherwise transfer the Software or this Agreement to anyone, including any parent, subsidiaries, affiliated entities or third Parties, or as part of the sale of any portion of its business, or pursuant to any merger, consolidation or reorganization, without Licensor's prior written consent. Any assignment or transfer effected in violation of this Section 10 shall be void ab initio and of no force or effect.

11. FORCE MAJEURE

Neither party shall be in default or otherwise liable for any delay in or failure of its performance under this Agreement if such delay or failure arises by any reason beyond its reasonable control, including

any act of God, any acts of the common enemy, the elements, earthquakes, floods, fires, epidemics, riots, failures or delay in transportation or communications; provided, however, that lack of funds shall not be deemed to be a reason beyond a party's reasonable control. The Parties will promptly inform and consult with each other as to any of the above causes that in their judgment may or could be the cause of a delay in the performance of this Agreement.

12. NOTICES

All notices under this Agreement are to be delivered by depositing the notice in the mail, using registered mail, return receipt requested, to the party's last known principal business address or to any other address as the party may designate by providing notice. The notice shall be deemed delivered four (4) days after the notice's deposit in the mail, if such notice has been sent by registered mail.

13. CHOICE OF LAW

This Agreement (including all Exhibits), including its formation, execution, interpretation, and performance, and the rights and obligations of the Parties hereunder, shall be governed by and construed in accordance with the laws of the Commonwealth of Pennsylvania, without regard to any conflicts of law (or choice of law) principles thereof.

14. CONSENT TO JURISDICTION

In the event that either party initiates litigation relating to or arising out of this Agreement, Licensor and Licensee irrevocably submit to the exclusive jurisdiction of the state or federal court in or for Philadelphia, Pennsylvania for the purposes of any suit, action or other proceeding relating to arising out of this Agreement or any transaction contemplated hereby or thereby ("Legal Proceedings"). Licensee further agree that service of any process, summons, notice, or document by U.S. registered mail to such Party's respective address shall be effective service of process for any Legal Proceeding. Licensor and Licensee irrevocably and unconditionally waive any objection to personal jurisdiction and/or the laying of venue of any Legal Proceeding in the state or federal court in or for Philadelphia, Pennsylvania, and hereby further irrevocably and unconditionally agree not to plead, argue, or claim in any such court that any Legal Proceeding brought in any such court has been brought in an inconvenient forum and otherwise waive any and all objections to the forum.

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(a) Complete Agreement. The Parties agree that this Agreement is the complete and exclusive statement of the agreement between the Parties, which supersedes and merges all prior proposals, understandings and all other agreements, oral or written, between the Parties relating to the use of the Software.

(b) Amendment. This Agreement may not be modified, altered or amended except by written instrument duly executed by both Parties. Any purchase orders or other ordering documents issued to Licensee by Licensor shall not have the effect of amending or modifying this Agreement, and shall only serve to memorialize the number of licenses or products ordered by Licensee. In the event of a conflict between the PSP Policies and this Agreement, the terms of this Agreement shall control.

(c) Waiver. The waiver or failure of either party to exercise in any respect any right provided for in this Agreement shall not be deemed a waiver of any further right under this Agreement.

(d) Severability. If any provision of this Agreement is invalid, illegal or unenforceable under any applicable statute or rule of law, it is to that extent to be deemed omitted. The remainder of the Agreement shall be valid and enforceable to the maximum extent possible.

(e) Read and Understood. Each party acknowledges that it has read and understands this Agreement and agrees to be bound by its terms.

(f) Limitations Period. No action arising under, or related to, this Agreement, may be brought by either party against the other more than two (2) years after the cause of action accrues, unless the cause of action involves death or personal injury.

(g) Attorneys' Fees. In the event any litigation is brought by either party in connection with this Agreement, the prevailing party in such litigation will be entitled to recover from the other party all the costs, reasonable attorneys' fees, and other expenses incurred by such prevailing party in the litigation.

(h) Authorized Representative. The person installing or using the Software on behalf of Licensee represents and warrants that he or she is legally authorized to bind Licensee and commit Licensee to the terms of this Agreement.

(i) Injunctive Relief. Licensee agrees that Licensor may suffer irreparable harm as a result of a violation of Sections 2, 4, 6, 10, 15, and 17 of this Agreement and that monetary damages in such event would be

substantial and inadequate to compensate Licensor. Consequently, Licensor shall be entitled to seek and obtain, in addition to such other monetary relief as may be recoverable at law or in equity, such injunctive other equitable relief as may be necessary to restrain any threatened, continuing, or further breach by Licensee without showing or proving actual damages sustained by Licensor and without posting a bond.

Table of Contents

1
System Overview

⚠Safety Messages

> ⚠***WARNING! Your safety is extremely important. Read and follow all warnings in this document before handling and operating the equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings.***

WARNING! – Warning messages can alert you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

IMPORTANT: – Important messages means that there is a risk of product or property damage if the instruction is not heeded.

Patent Information

This product is covered by patents owned or licensed by SKF USA Inc. and is intended for use only with components authorized by SKF. Any use of this product in combination with other components not purchased from SKF may subject the user to liability for patent infringement.

FCC and IC Regulatory Text (English and French)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. (ref: 47 CFR part 15 subpart A Section 15.21)

This device complies with FCC Part 15 and Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Toute modification non approuvée expressément par la partie en charge de la conformité peut annuler le droit d'utilisation de l'appareil par le consommateur. (Voir 47 CFR Sec. 15.21)

Cet appareil est conforme à FCC Partie15 de Industrie Canada RSS standard exempts de licence (s). Son utilisation est soumise à Les deux conditions suivantes: (1) cet appareil ne peut pas provoquer d 'interférences et (2) cet appareil doit accepter Toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif.

L'antenne utilisée pour ce transmetteur doit être installé pour fournir une distance de séparation d'au moins 20 cm de toutes les personnes et ne doit pas être co-localisés ou fonctionner en conjonction avec une autre antenne ou transmetteur.

Personnel Safety

Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing, and gloves away from moving parts.

Do not overreach. Keep proper footing and balance at all times to enable better control of the device during unexpected situations.

Use safety equipment. Always wear eye protection. Non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

Do not repair or adjust energized equipment alone, under any circumstances. Someone capable of providing first aid must always be present for your safety.

To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Keep minimum safe distance from the antenna. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna used for this transmitter must be installed to provide a distance of at least 20 cm (8 in.) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Device Safety

Do not operate the equipment without the antenna connected.

Device service must be performed only by qualified SKF repair personnel.

Use only accessories recommended or provided by SKF USA Inc. or the manufacturer.

Energized Equipment

Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

No Submersion/Immersion

This equipment is IP66 rated, is dust-tight and resistant to powerful jets of water. Do not immerse in any liquid. If the instrument is subjected to these conditions, adverse operation may result, and there is a risk of serious injury or damage should fire occur.

Avoid Damage and Injury

To avoid costly damage to the instrument or injury from a falling instrument, place the instrument on a solid stable surface when not in use and do not place any heavy objects on it.

Use a damp, clean cloth for cleaning. Do not use cleaning fluids, abrasives, or aerosols. They could cause damage, fire, or electrical shock.

Do not open the device cover in a hazardous area, or in locations where contact with water or other contaminants may occur.

About This User Manual

This user manual provides technical information about the SKF Multilog On-line System WVT device (WVT stands for Wireless Vibration Transmitter), commonly called the "SKF Multilog WVT" in this user manual. This user manual also helps you to set up the SKF Multilog WVT device in the OneWireless* network. Setting up the SKF Multilog WVT includes installing and using the DataController interface to:

- Establish global configuration parameters for the device initialization
- Set up the data collection schedule
- Export the device hierarchy and vibration data to SKF @ptitude Analyst
    - ➢ This manual does not cover exporting data directly from the Honeywell OneWireless Wireless Device Manager (WDM) to other process control or asset management systems.

As you use this manual, you'll discover certain conventions used:

Bold type is used to indicate text that appears on a menu, window or dialog.

Italics are used to emphasize important information.

➢ - are used to indicate notes to the reader.

Step-by-step procedures are sequenced using bullets, •.

In writing this manual we assume you are familiar with common Windows® operations. Refer to your Windows guides for information in these areas.

Related Documentation

Document	Part No.
Wireless Device Manager (WDM) User Interface User Manual	P/N 32312000
OneWireless Wireless Device Manager User's Guide	

* OneWireless is a trademark of Honeywell International Inc.

Technical Support

If you have questions regarding the installation or operation of the SKF Multilog WVT, contact SKF's technical support staff.

Internet Support
www.skf.com/cm

Email
TSG-Americas@skf.com (North America, South America and Asia)
TSG-EMEA@skf.com (Europe, Middle East and Africa)

Phone Support
1-800-523-7514, 8 a.m. – 5 p.m. PST Monday to Friday

Fax Support
1-858-496-3531

Address your fax to **SKF Technical Support**. Include information on your hardware/ software environment, and describe your problem or question in detail. Also, leave a phone number, fax number or website where we may return your call.

SKF Multilog WVT System Overview

The SKF Multilog On-line System WVT (SKF Multilog WVT) unit is a compact, four-channel vibration and temperature field-mounted monitoring device that communicates on the ISA100.11a wireless standard. It also has a tachometer input to monitor the speed of the machine. The device can be battery powered or powered from a DC voltage source. It is ideal for monitoring machines in areas that are inaccessible, difficult or dangerous to reach, or where it would be expensive or hazardous to install cables.

The digitizes dynamic machine condition analog signals using an on-board analog-to-digital converter (ADC) and stores them in internal memory. This data is then passed over the ISA100.11a network to a host computer, where it is automatically imported to the SKF @ptitude Analyst software for viewing and analysis. The data can also be imported to a Distributed Control System (DCS), such as Honeywell's Experion.

The network components of a system that supports SKF Multilog WVT devices are shown in Figure 1-1. The SKF Multilog WVT is a field device which communicates wirelessly with an access point known as a Field Device Access Point (FDAP). The FDAP then communicates via a local field Ethernet network to a Wireless Device Manager (WDM). The WDM has a second Ethernet network for passing data, for example, to a host computer which will process and analyze the data. In this case, the host computer would be running SKF @ptitude Analyst. The data can also be exported using the available industrial protocols MODBUS, OPC and HART through the WDM.

A typical system consists of multiple SKF Multilog WVT devices and FDAPs with one WDM managing the network. The ISA 100.11a standard allows for field devices to pass data from one to another to an FDAP. When line powered field devices have routing enabled, data "hops" from one field device to the next, thus increasing the overall range of the network and reducing the number of FDAPs needed.

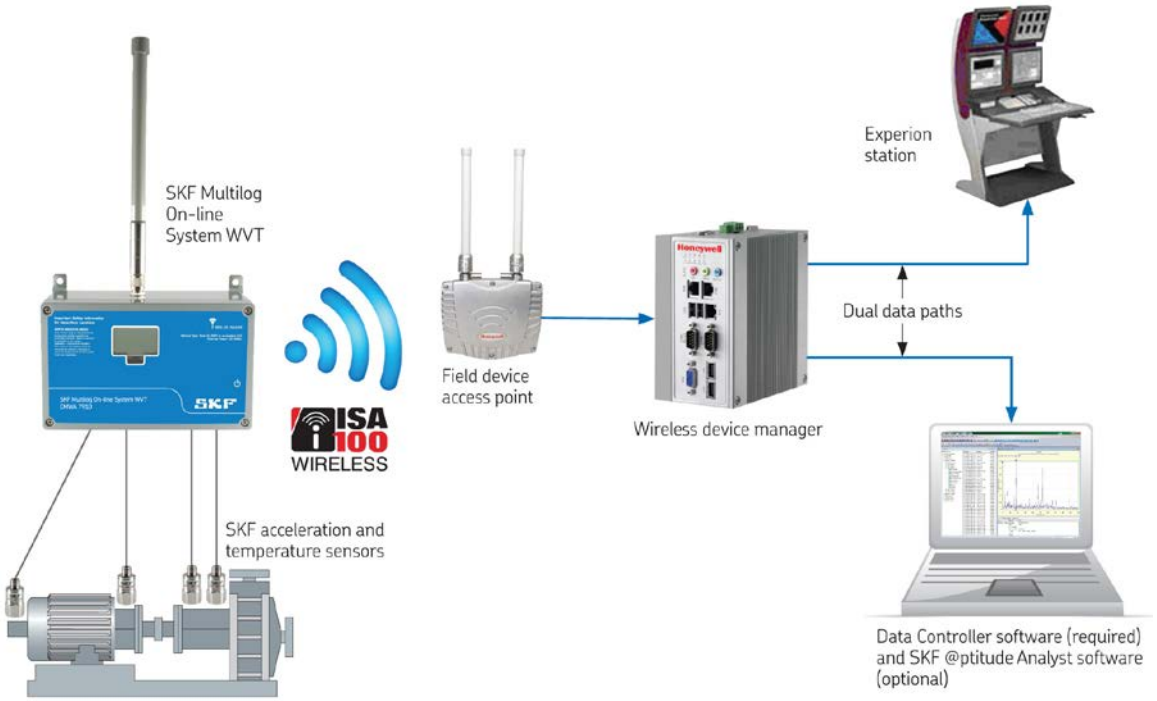


Figure 1 – 1.
System Components: Hardware and Basic Network.

Hardware and Network Requirements

The primary hardware and network components include:

Host computer with DataController software – The DataController application is a Windows service that facilitates collection of data from SKF Multilog WVTs and makes the vibration waveform data available to SKF @ptitude Analyst.

Predictive Maintenance computer with SKF @ptitude Analyst software – Host and Predictive Maintenance computers can be the same computer. Refer to the SKF @ptitude Analyst documentation for the recommended requirements for your version.

Wireless Device Manager (WDM) – The Wireless Device Manager hosts the gateway, system manager and security manager components as defined by ISA100.11a standards. It manages the wireless field instrument network and all wireless field devices, including ISA100.11a field instruments, FDAPs and any wired field devices with an ISA100.11a adapter. It authenticates the provisioning data with which a field device tries to join the network. Refer to the user manual for your WDM for details on setting up these network devices. The WDM requires firmware OneWireless 0W220.3-02.0 release or later. The same desktop or laptop running DataController may be used to access the WDM's web page user interface through a browser.

- The WDM's web page resides inside the WDM, not on the Internet.

Field Device Access Point (FDAP) – The FDAP is an industrial meshing access point for field instruments and rated for use in hazardous plant environments.

SKF Multilog On-line System WVT, CMWA 7910 (called the "SKF Multilog WVT" in this user manual) – Provides 4-channel dual input, combination vibration and temperature measurements, and tachometer input for machine speed measurement. Integrated digital display shows the latest overall measurements for all four channels and remaining battery life with the push of a button.

CMSS 2350T-D2 sensors and cables (four in starter kit CMWA 7910-SK). - Note that these unique sensors, and only these sensors, are required for the SKF Multilog WVT.

Provisioning Device (optional) – If over-the-air provisioning is not used, a provisioning device will be required for providing the SKF Multilog WVT with security keys from the WDM. The provisioning device is a handheld PDA unit with an Infrared Data Association (IrDA) port that communicates with the IrDA port on the SKF Multilog WVT unit. Your OneWireless network must be available for the SKF Multilog WVTs to join after they are provisioned.

Communication

The SKF Multilog WVT contains a radio module which is in permanent communication with the ISA100.11a wireless network. The radio board is compliant with European Telecommunications Standards Institute (ETSI) EN 300 328 v 1.8.1. The software in the host computer controls each SKF Multilog WVT with a set of commands. In addition, the network manager in the WDM maintains "housekeeping" communication with all the devices in the network to optimize the network performance.

- CMWA 7910-FCC/IC has the radio power level of 11 dBm, as specified by the Federal Communications Commission (FCC) and Industry Canada (IC).
- CMWA 7910-ETSI has the radio power level of 4 dBm, as specified by the European Telecommunications Standards Institute (ETSI).

The data acquisition section of the SKF Multilog WVT acquires samples according to the downloaded configurations at a user defined interval. Each SKF Multilog WVT automatically publishes trend measurements through the network. The trace measurements are, however, required to be directly uploaded by the software from the SKF Multilog WVT according to the user defined schedule.

Identification in the Wireless Network

Each SKF Multilog WVT device on the network is distinguished by a unique 64-bit EUI64 identifier. This number is permanently programmed into the SKF Multilog WVT unit at the factory and cannot be changed, similar to a MAC address. Devices are authenticated onto the network by provisioning, which provides each SKF Multilog WVT device with a key to allow it to communicate with the WDM. Provisioning is discussed in detail later in this user manual.

Software Requirements

SKF provides the following software and related documentation supporting the SKF Multilog WVT:

- SKF @ptitude Analyst software (host computer resident)
- SKF Multilog On-line System WVT Product CD containing:
  - SKF Multilog On-line System WVT User Manual (this document)
  - Wireless Device Manager (WDM) User Interface User Manual
  - DataController software
  - CSA Certificate of Compliance

Other software supporting the SKF Multilog WVT includes the following:

- Windows operating system with Windows XP (Service Pack 1, 2, and 3), Windows Vista or Windows 7
- Provisioning software (WDM/PDA resident), optional, in the handheld iPAQ provisioning device
- For the Wireless Device Manager (WDM) user interface, one of the following recommended Web browsers must be installed on the computer: Microsoft Internet Explorer 7.0 or higher, Firefox 3.6 or higher or Google Chrome 12.0 or higher. The recommended monitor resolution for the WDM user interface is 1280 x 1024.
- Microsoft Silverlight 5 plug-in is required on the computer used for accessing the WDM user interface. You will be prompted to install or update Silverlight when you attempt to connect to the WDM only if it is not installed or if the computer has a prior version. A copy of Silverlight is maintained on the WDM for installs and upgrades; no Internet or external connection is required.
- Microsoft .NET Framework 4 is required for the DataController application

Network Data Flow

In a typical industrial plant, the SKF Multilog WVTs can be spread across multiple WDMs and multiple ISA100 networks due to their physical location. Each WDM can communicate with up to 30 SKF Multilog WVT devices (if the network is exclusively SKF Multilog WVTs). The network will have fewer SKF Multilog WVTs if there are other ISA100 field devices present. DataController can communicate with and collect SKF Multilog WVT vibration data from up to eight WDMs. The block diagram below illustrates the flow of data in the SKF Multilog WVT system.

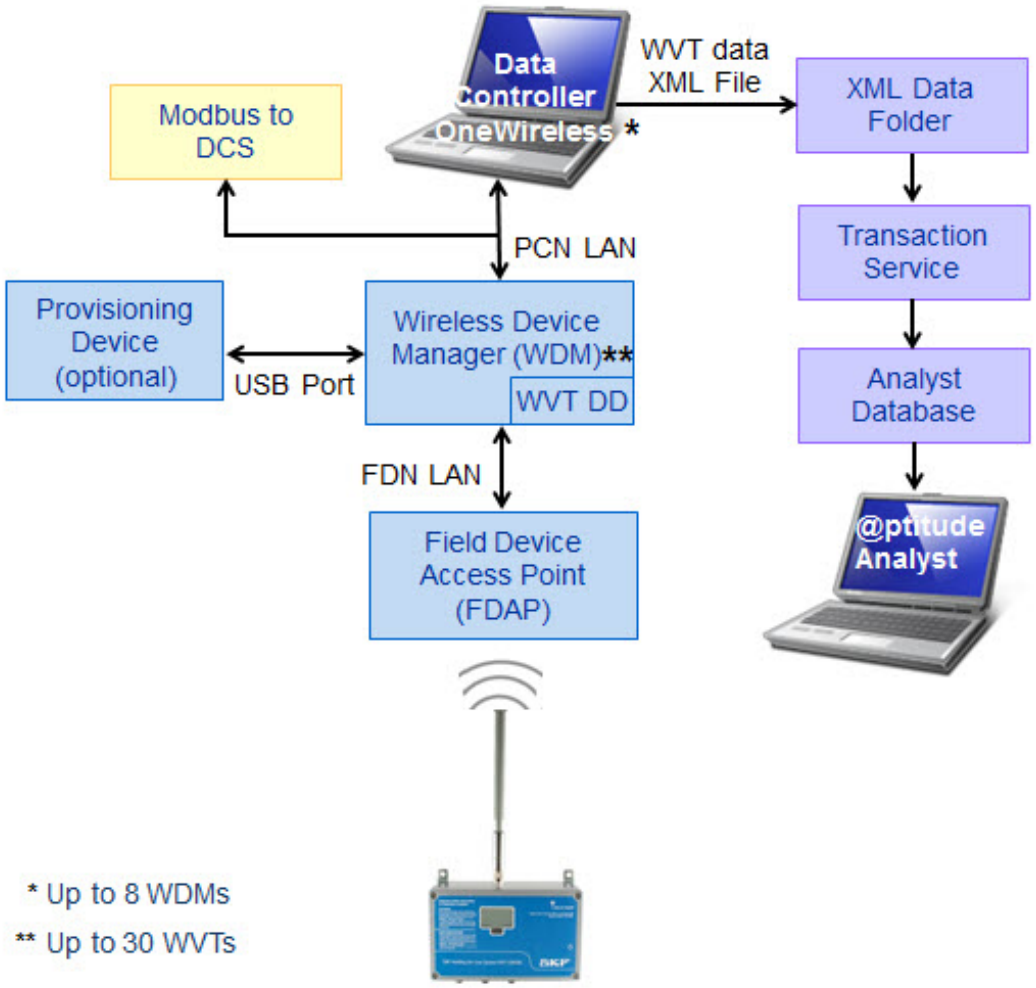


Figure 1 - 2.
Network Data Flow Diagram.

OneWireless Terminology

Some terms commonly used with OneWireless networks are defined below.

Term	Definition
Access Point	The device that bridges the wireless and wired networks.
WDM	Wireless Device Manager (WDM) is a device that manages the ISA100.11a wireless field device network and all the ISA100.11a components connected to the OneWireless network.
FDAP	Field Device Access Point (FDAP) is a wireless infrastructure node that acts as an ISA100.11a access point and a mesh node member. An FDAP can only communicate through ISA100.11a.
Field device	A general term for a process sensor (input) or process actuator (output) device.
Mesh	Network topology where one node may be connected to one or more nodes.
Node	A connection point, either a redistribution point or an end point for data transmissions.
Provisioning device	Includes the iPAQ handheld, which is a type of pocket PC or personal digital assistant (PDA), PDAs, mobile PCs and so on with an IrDA port that can be used to provision field devices with network security information.
DD	Device Description file
FDN	Field Device Network
PCN	Process Control Network
RSQI	Receive Signal Quality Index corresponds to the Link Quality Threshold between devices. The link between devices is established only when the RSQI is equal to, or greater than, the Link Quality Threshold. By default, the Link Quality Threshold is set to 127 in the WDM.
RSSI	Receive Signal Strength Index represents the link strength of the two devices connected to each other. The RSSI range is displayed in the format –xx/-yy dBm, where –xx and –yy represent the link strength of the two devices. When the difference between –xx and –yy is less than 5, the lowest of the two values is displayed.
HART	Highway Addressable Remote Transducer
GCI	Gateway Client Interface
TxFailRatio	Transmit Fail Ratio. TxFailRatio = Transmit Fail / (Transmit Success + Transmit Fail)

User Manual Outline

This user manual presents the following topics in the subsequent chapters:

Chapter 2, Hardware Overview – covers the SKF Multilog WVT external and internal details, connections, power sources, and specifications of the device and the sensors.

Chapter 3, System Setup Checklist – provides a 1-page guideline to follow when setting up the device in a OneWireless network.

Chapter 4, Setting Up the Network – covers network planning considerations and provides procedures to connect network components, configure the WDM and PCN network properties, and upload the Device Description file to the WDM.

Chapter 5, Setting Up the SKF Multilog WVT – presents the setup procedure, how to commission the device, and how to mount the device and remote antenna.

Chapter 6, DataController Installation – includes an overview of the DataController interface and covers installing DataController, and launching the Service Manager service.

⚠IMPORTANT: The SKF Multilog WVT must be initialized with the DataController software.

Chapter 7, DataController and XML File Editor – describes how to set up global configuration parameters to initialize the SKF Multilog WVT when the device joins the network for the first time.

Chapter 8, DataController and the WDM – details how to configure the WDM's Gateway Client Interface (GCI Server) to establish communication between DataController and the WDM.

Chapter 9, Configuring the XML Import – shows how to configure the SKF @ptitude Analyst > XML Import interface to import SKF Multilog WVT data from the DataController software.

Chapter 10, Provisioning the Network Devices – describes provisioning network devices and details both the over-the-air and handheld device methods.

SKF Multilog WVT Maintenance

Once the SKF Multilog WVT devices are installed and operating in the network, the monitoring and maintenance of the system is generally performed through the WDM User Interface (OneWireless). The *Wireless Device Manager (WDM) User Interface User Manual* is provided as a separate document.

Refer to the *Wireless Device Manager (WDM) User Interface User Manual*, *Chapter 9, SKF Multilog WVT Maintenance*, for the following maintenance operations:

- Restarting an SKF Multilog WVT in the network
- Replacing an SKF Multilog WVT in the network
- Removing an SKF Multilog WVT from the network

- Upgrading the SKF Multilog WVT application firmware
- Upgrading the SKF Multilog WVT radio firmware
- Changing the Trend Sampling Interval
- Changing the Trace Sampling Interval

2
Hardware Overview

Included Items

On receipt, you will find the following items in the SKF Multilog WVT carton:

- The SKF Multilog On-line System WVT unit
- External omnidirectional antenna
- Gland position blanking plugs
- Spare screws and fittings
- Self-amalgamating tape
- SKF Multilog On-line System WVT Product CD

External Overview

On unpacking the unit, screw the external antenna on to the connector on the top of the unit. If the device is going to be used in harsh conditions, a small roll of self-amalgamating tape is included to provide additional protection from the environment. Install mounting bracket, if required.

Externally, the unit includes the following features:

- Antenna, as described below
- Window for viewing the LCD backlit display
- Push button on the right side for the LCD display
    - ➢ In environments below -30 °C (-22 °F) the LCD will not turn on.
- Six glands for connecting sensors, tacho and external power (if not battery powered)
- Mounting holes

Figure 2 – 1.
SKF Multilog WVT External View.

Antenna

The SKF Multilog WVT uses an omnidirectional, rugged, lightweight and waterproof antenna. Specifications are:

Frequency:	2 400 to 2 485 MHz
Gain:	5 dBi
Vertical bandwidth:	25 degrees
Weight:	0.2 kg (0.5 lbs.)
Length x diameter:	355 x 15 mm (12 x 0.6 in.)
Waterproof N male connector	IP66 rating

Internal Overview

Analog Input Signals

The SKF Multilog WVT has four pairs of channel inputs, each pair comprising a dynamic accelerometer input and a process temperature input. It is designed to operate with low-power dual output sensors which provide a dynamic vibration signal and a static temperature signal. Power to the sensor is 3.3 VDC.

Tachometer (or Tacho) Inputs

In addition, there are two tacho inputs. Note that only one tacho input can be used at a time. There is an isolated input which is intended to take a signal from an existing system output (which has its own power and ground – hence the requirement for isolation). The second interface is for a Namur type sensor. This is a low-power inductive device which is powered directly from the SKF Multilog WVT unit.

Battery Power / External Power

The SKF Multilog WVT unit can be powered by internal batteries or external power. Refer to the section on *Power Sources* later in this chapter for details.

The following photo shows the interior of the SKF Multilog WVT with important connectors and components labeled.

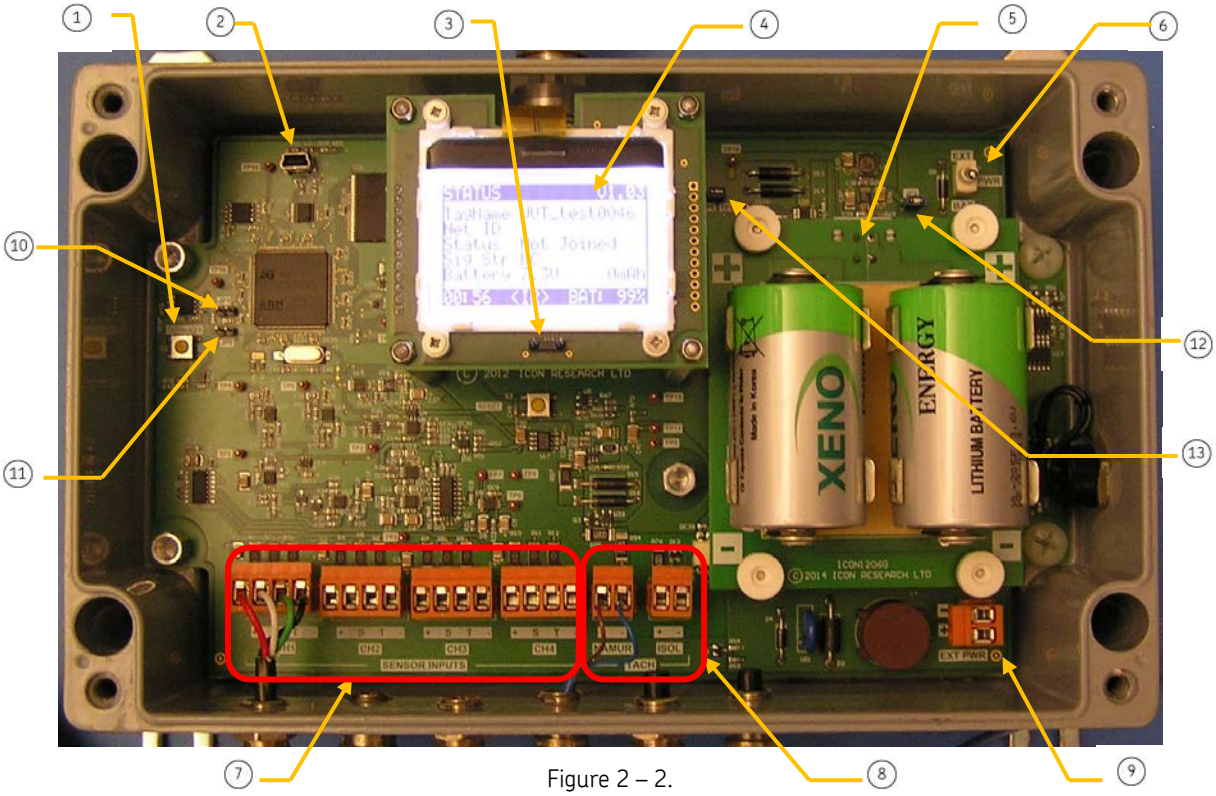


Figure 2 – 2.
SKF Multilog WVT Internal View.

1. DEFAULTS push button
2. USB port
3. IrDA port
4. Display
5. Battery holder
6. BAT/EXT switch
7. Four sensor input channels
8. Namur or isolated tacho input
9. External power connector
10. JP1
11. JP2
12. JP3
13. JP4

Jumper Assignments

Release Board Rev E	Default	Function	Description
JP1	Not inserted	PROGRAM	Insert for USB programming.
JP2	Not inserted	TEST/RUN	1. Insert and apply power to enter autotester mode. 2. Insert with power applied and press green button to enter COMMISSIONING mode.
JP3	Inserted	Overall Current	Remove jumper and insert ammeter to measure current to whole board from battery or external power.
JP4	Inserted	Radio Current	Remove jumper and insert ammeter to measure current to analog radio. Can also be used to power cycle radio independently.

Display

The display on the front shows the status of the SKF Multilog WVT. You can interrogate the unit at any time by pressing the display push button on the right side of the unit. On pressing the push button, the backlight is illuminated for five seconds and subsequent presses will scroll through three screens. When measurements are being made for transmission over the network, the values are displayed on the screen. The display will automatically turn off after a few seconds.

- ➢ If the device is busy, it will not respond immediately to the push button. Wait approximately 15 seconds and then try again.
- ➢ In environments below -30 °C (-22 °F) the LCD will not turn on. (Software prevents the LCD from turning on to protect it.)

- Push the button once to view LAST PV's (trends), the last set of measured values.

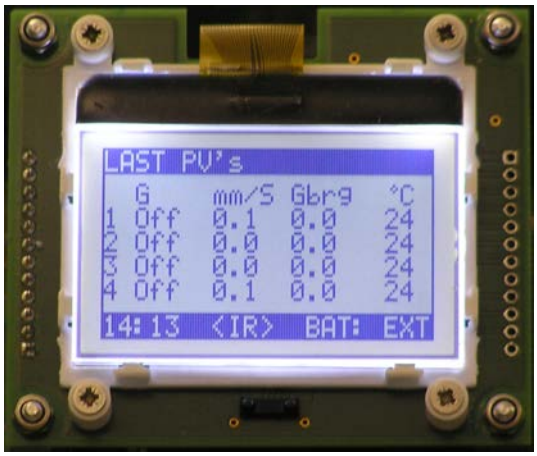


Figure 2 – 3.
First Display Screen – Last PV's.

- Push the button again to view SYSTEM, system information such as bias voltages and next route information.

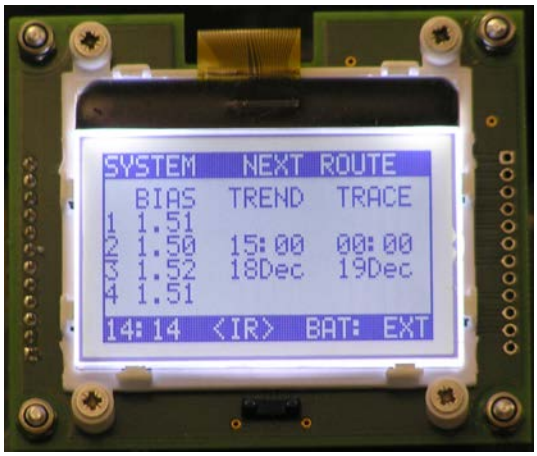


Figure 2 – 4.
Second Display Screen – System.

- Push the button again to view STATUS, which includes network information, battery charge data and the firmware version.

Figure 2 – 5.
Third Display Screen – Status.

  - If the push button is not pressed for 10 seconds, then the display turns off. While looking at the display, pressing the button will re-illuminate the backlight if it has gone off.

Another screen is used during device commissioning. Device commissioning allows the SKF Multilog WVT to be tested independently of the network. This is useful to check the connection of the sensors and the tacho device after they are connected to the SKF Multilog WVT. Commissioning mode is discussed later in this user manual.

IrDA Interface

Directly below the screen and visible through the window is the IrDA interface. This is used to communicate with a PDA device that is running the provisioning application. The IrDA is enabled whenever the LCD display is on. The message **<IR>** is displayed on the lower banner while the unit is ready to connect with a PDA. If there is no PDA in

range after this time, the IrDA interface is turned off after 20 seconds to conserve power.

Restoring Factory Defaults

On the left side of the main board is the DEFAULTS push button. This is accessible through the hole in the transparent barrier that is required for hazardous area installation. The DEFAULTS push button is is used to restore the unit to its factory default settings.

To reset the unit to its factory defaults:

- Press the push button on the outside of the unit to illuminate the display.
- Hold down the DEFAULTS push button for five seconds. The countdown status is shown on the display.

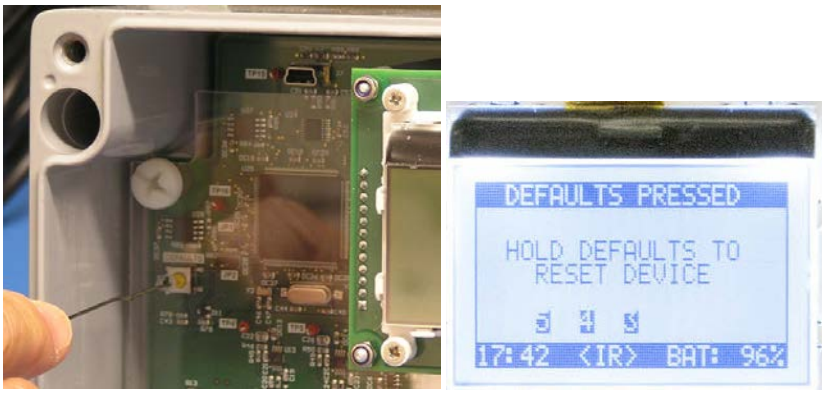


Figure 2 – 6.
Five Second Countdown in Progress.

After the five second countdown, a message states: Device Defaults Being Reset.

Figure 2 – 7.
Device Defaults Being Reset Message.

➢ The SKF Multilog WVT will lose network connection after being returned to factory defaults. It will have to be reprovisioned to rejoin.

Connections

Analog Sensor Input Connections

The SKF Multilog WVT has four input channel pairs, making a total of eight input channels. The four input channel pairs are identical and comprise one dynamic input for vibration and one static (or process) input for temperature. The unit is designed to work with the CMSS 2350T-D2 sensor. This is a four-wire device comprising power, analog vibration signal, temperature and ground as detailed in the table below.

Analog Input Channel Pair Connections

Pin	Function	Notes
+	Sensor supply (+ve) (red wire)	Nominal +3.3 VDC (max current 100 µA)
S	Analog signal input (white wire)	Input range 0 to 3 V
T	Temperature input (green wire)	Input range 0 to 3 V
–	Common (black wire)	Sensor common

The four input channel pairs are labeled CH1, CH2, CH3 and CH4. The orange connector on each can be removed to make wire termination easier.

It is not necessary to connect the temperature input if it is not needed. Note that there is no cable shield grounding inside the SKF Multilog WVT. The shield of the CMSS 2350 sensor cable, CMAC 2350-CABLE-xxM (xxM indicates the cable length in meters), is grounded at the sensor side.

Any unused glands must be removed and replaced with the blanking plugs provided, tightened to 4 N-m (35 lb.-in.) torque to maintain the IP rating.

Analog Input Electrical Details

The sensor is powered by 3.3 VDC power from the board relative to common. Power can be turned on and off to each sensor to conserve battery power. The signal returned from the sensor swings around a 1.5 V mid-point with a range of ±1.25 V. So the total input range is 0.25 to 2.75 V. Therefore, for a nominal 50 mV/g sensor, the overall range is ±25 g (or 25 g peak).

The bias voltage point of 1.5 V is monitored by the unit and an alert is generated to the system if it goes out of range. The bias voltage may vary based on temperature.

Measurements are multiplexed to the on-board 16-bit analog-to-digital converter. There is an additional hardware demodulator (or enveloper) for bearing condition measurement. Dynamic signals pass through various gain, filtering and anti-alias stages, whereas the static signals pass directly to the analog-to-digital converter.

The scaling of the static temperature inputs is assumed to be –10.9 mV/°C giving an overall sensitivity range of –50 to +150 °C (–58 to +302 °F).

Tacho Input Connections

There are two types of tacho input:

- ISOL: isolated digital input
- NAMUR: Namur sensor compatible input

The above tacho inputs are wired internally so that only one type of input can be used at a time. Choose in advance whether you wish to use the isolated tacho input or a Namur sensor.

Tacho Input – ISOL

The isolated tacho input is on the two-wire connector marked ISOL. Connections are as in the table below.

Tacho Input Connections – ISOL

Pin	Function	Notes
+	Tacho signal input	Logic high 3.3 to 24 V, logic low <0.5 V, min 2 mA drive
–	Tacho common	

This input requires a logic pulse and is compatible with any voltage pulse input in the range of 3.3 to 24 VDC. Logic "0" must be less than 0.5 V. The minimum current drive of the input signal must be 2 mA.

Tacho Input – NAMUR

A Namur type sensor can be connected to the tacho input marked NAMUR. Connections are shown in the table below.

Tacho Input Connections – NAMUR

Pin	Function	Notes
+	Sensor connection (+ve)	NAMUR sensor wire, normally Brown
–	Sensor connection (-ve)	NAMUR sensor wire, normally Blue

The Namur input meets the Pepperl+Fuchs type 4 interface requirements. Examples of the maximum temperatures for the type 4 interface application are shown in the table below. The type of Namur sensor must be one that can be used in hazardous locations and has a nominal 8.2 V operating voltage with nominal 3 mA current when no target is present and 1 mA nominal current when a target is present. An example of an embedded sensor with 5 mm range is NCB5-18GM40-N0-V1. There are a number of options for embedded, non-embedded, with and without integral cable.

Maximum Temperatures

types	type 4 °C		
	T6	T5	T4-T1
NCB1,5...M...N0...	22	34	62
NCB2-12GM...-N0...	37	49	63
NCB5-18GM...-N0...	37	49	63
NCB10-30GM..-N0...	37	49	63

Note that the power available to the sensor from the + pin of the connector is nominal 6 V with built-in power limiting. The Namur sensor is specified to operate down to a voltage of 5 V. The SKF Multilog WVT senses the change in current from 3 to 1 mA when a metal target is within the sensitivity range.

Installation Torque

Recommended Torque

Vibration sensor mounting torque	2.9 N-m (24 lb.-in.)
Cable gland cap and base torque – unused glands replaced with blanking plugs	4 N-m (35 lb.-in.)
Antenna connector retaining nut	5 N-m (44 lb.-in.)

Power Sources

The SKF Multilog WVT unit can be powered by internal batteries or external power.

When using battery power, batteries are fitted into the holder unit which is held in place by four thumbscrews. The PWR switch in the top-right corner should be set to BAT when using batteries. When the switch is in the EXT position, the batteries are isolated. The unit detects when batteries have been physically removed. It assumes that fresh batteries have been inserted and resets the internal battery monitor to “full”. The battery monitor is not reset if the switch is moved to the EXT position and back.

Alternatively, the unit can be powered by an external supply in the range of 10 to 30 VDC. Make sure the power source can supply the peak current required. Connect the supply to the EXT PWR connector in the bottom right corner paying attention to the +ve and –ve polarity. The unit is reverse polarity protected and therefore cannot be damaged if the power source is temporarily connected incorrectly. Move the PWR switch to the EXT position.

When powered by battery, you must disconnect the external power source so the firmware can correctly identify the power source type.

Power Considerations

The following table compares line powered vs. battery powered SKF Multilog WVT devices used for specific functions.

SKF Multilog WVT Function	Line Powered SKF Multilog WVT	Battery Powered SKF Multilog WVT
Routing	Yes	**No** **WARNING!** The WDM web page permits you to enable routing on a battery powered device, but doing so causes the battery level calculation to be inaccurate. Enabling routing will produce an irreversible error in the battery level calculation until the batteries are replaced with a new pair.
Trace collection time	Minimum time possible	Roughly double the time of the line powered device

Battery Replacement

> ⚠ ***WARNING! EXPLOSION HAZARD! The enclosure cover and the transparent plastic barrier must be fitted when the unit is situated in a hazardous area and may not be removed unless the area is known to be non-hazardous.***

Two 3.6 V Lithium type batteries (size D) are required to power the SKF Multilog WVT when on battery power. Battery type XL-205F 19Ahr from XENO is recommended. **The batteries cannot be recharged.** The SKF Multilog WVT contains a battery "gas gauge" that is read by the controlling application to allow the charge remaining to be monitored.

> ⚠ ***WARNING! The battery level reading resets to 100% after the batteries are removed from the holder.***

You can check the battery level of the SKF Multilog WVT in the WDM user interface by going to **Device Vendor Parameters > Device Power > Battery Level**.

> ⚠ ***WARNING! Failure to follow these battery safety instructions may result in risk of fire, electric shock or electrocution, or damage to the unit.***

To replace the batteries:

- In a non-hazardous area, remove the cover from the SKF Multilog WVT unit.
- Flip power switch PWR to the EXT position.
- Unscrew the thumbscrews on the battery holder and remove the battery holder.
- Replace the batteries with a fresh set, ensuring that the polarity matches the markings on the holder.

> ⚠ ***IMPORTANT: Always use fresh batteries. Do not mix new and old batteries.***

- Re-insert the holder and tighten the thumbscrews.
    - ➢ Alternatively, an additional battery holder (P/N CMAC 7910-BH) can be purchased separately for convenience. The replacement

batteries can be secured in the additional battery holder in a non-hazardous area. Then, the battery holder with expended batteries can be removed from the SKF Multilog WVT to be replaced with the additional battery holder already loaded with fresh batteries.

- The SKF Multilog WVT always assumes that fully-charged batteries have been inserted. The "gas gauge" is automatically reset when batteries are changed. To ensure that the "gas gauge" resets correctly, remove the exhausted batteries and wait at least 30 seconds before inserting fresh batteries.

- Flip the power switch PWR to the BAT position.
- Replace the cover.

⚠ ***WARNING! Dispose of used batteries according to your local regional requirements.***

Battery Conservation

Benchmark Configuration

Using our standard benchmark configuration in all four channels (shown below), the projected battery life is up to five years, assuming there are no network issues and the system is left unchanged throughout.

Benchmark Configuration

Measurement Type	Schedule
Trend Velocity	Hourly
Trend Bearing	Hourly
Trend Temperature	Hourly
Trend Speed	Hourly
Trend Bias Voltage	Daily
400 Line 1 kHz Velocity Spectra	Daily
800 Line 1 kHz Bearing Spectra	Daily
2048 Samples Bearing Waveform	Monthly

Events Affecting Battery Life

The following table summarizes some common events and their impact on the expected life of the batteries in the SKF Multilog WVT.

Event (Cause)	Result	Actions
High Impact		
Battery powered SKF Multilog WVT set as router in the WDM web page. (Only line powered devices should be used as routers.)	The battery gas gauge is inaccurate under this condition. The device will report the battery level is well above zero but then suddenly report critical battery failure (<4.8V) and die.	Do not use a battery powered SKF Multilog WVT as a router.
Medium Impact		
The user has the Property Panel open for the SKF Multilog WVT or one of its channels. The WDM polls the device for all of the dynamic attributes that are in the open Property Panel.	If the browser focus is left set over the weekend by mistake, then the battery life is shortened by 2.7 days	Keep Channel Property Panel closed when not in use.
The SKF Multilog WVT is on active network search one day before the network is switched on.	5 days of battery life lost	Make sure the network is up before switching on the SKF Multilog WVT. Avoid extended periods of network outage.
The SKF Multilog WVT is on active network search one week before the network is switched on.	35 days of battery life lost	Make sure the network is up before switching on the SKF Multilog WVT. Avoid extended periods of network outage.
The SKF Multilog WVT is on active network search one month before the network is switched on.	5 months of battery life lost	Make sure the network is up before switching on the SKF Multilog WVT. Avoid extended periods of network outage.
Intermittent network connection due to FDAP/WDM outage for 1 hour per day.	20% of battery life lost	Minimize WDM outage.
Low Impact		
The user manually sets the channel to Active before DataController is available to initialize the SKF Multilog WVT. Therefore, the device does not publish correctly.	The background network maintenance current increases by 50%.	Always allow DataController to activate the channel automatically.

Event (Cause)	Result	Actions
In order to make a change to a channel attribute, the channel must first be disabled (OOS), and then enabled (AUTO) again after the change. The act of changing the mode between OOS and AUTO makes the WDM poll for all of the static attributes of the device.	One change (all channels) per day: 0.8% battery life lost One change (all channels) per week: 0.1% battery life lost One change (individual channel) per day: 3.0% battery life lost One change (individual channel) per week: 0.4% battery life lost	Activate/deactivate the channels all at once by using the Activate/Deactivate controls in the WDM user interface ribbon bar.

Storing the SKF Multilog WVT

Because the unit does not turn off, if you remove a battery powered SKF Multilog WVT from the network for storage, it will continue to search for the network. To conserve battery power and preserve the battery level, be sure to flip the power switch PWR to the EXT position. Do not remove the batteries from the unit because that will reset the battery level.

Specifications of SKF Multilog WVT

Measurement

Dynamic Channels	
Number of channels	4 dual input, vibration and temperature
Sensor type	Accelerometer, special low power (<300 µW per channel)
Coupling	DC
Accelerometer power	3.3 VDC
Input Impedance	Minimum of 150 kΩ
Nominal sensitivity	50 mV/g
Amplitude range	±25 g
Measurements	Acceleration, enveloped acceleration, velocity (by software integration)
Gain ranges	2 gain steps of 1 and 10
Amplitude accuracy	±2% typical in passband
Dynamic range	>70 dB
Bias voltage check	Programmable interval
Temperature input range	0.25 to 2.75 V
Sensitivity	–10.9 mV/ºC
Temperature measurement range	–50 to +150 °C (–58 to +302 °F)
Accuracy	±2.5 °C (±4.5 °F) typical

Processing

ADC	16 bit SAR, multiplexed on channels 1 to 4
Sampling rate	256 Hz to 51.2 kHz
Bandwidth ranges	(0.5 to 100 Hz) to (0.5 Hz to 20 kHz), Fmax in 1, 2, 5 steps
Data block lengths	256, 512, 1024, 2048, 4096, 8192
Spectral lines	100 to 3 200 (Limited at lower Fmax to reduce acquisition time. See the table Number of Averages Allowed in **Chapter 7, DataController and XML File Editor**.)
Integration	One level of software integration
Bearing demodulation	Hardware demodulator, fixed bandpass 500 Hz to 10 kHz (SKF enveloped acceleration filter 3)
Averages	1 to 4, 50% overlap, spectral domain only
Processor	ARM9, ultra-low power
Non-volatile RAM	512 kB
RTC	Internal real-time clock
Watchdog function	Automatic recovery on power interruption

Tacho

Number of channels	1
Options	Digital isolated or Namur
Isolated input trigger levels	Logic "0" < 0.5 V, logic "1" 3.3 to 24 V, minimum current drive 2 mA
Namur supply voltage	Nominal 6 VDC
Namur input	Pepperl+Fuchs type 4 interface
Namur type	Two-wire low power type (minimum operating level 5 V, no target output nominal 3 mA, target output nominal 1 mA)
Maximum speed	10 kHz
Minimum speed	1/trigger timeout

Interfaces

Visual display	21 characters x 7 lines LCD display, LED backlit with auto-shutdown
Local push button	Allows local interrogation of measurements and unit status. (See **Display** in **Chapter 2, Hardware Overview**.)
Provisioning interface	IrDA, with ISA100.11a protocol

Communications

Network	802.15.4 ISA100.11a compatible
Cable	USB port for diagnostics and firmware upgrade
Firmware programming	Upgrades over radio network or USB port

Radio

FCC/IC (Federal Communications Commission/Industry Canada)	Radio 11 dBm, antenna 5 dBm, range 300 m (984 ft.)
ETSI (European Telecommunications Standards Institute)	Radio 4 dBm, antenna 5 dBm, range 100 m (328 ft.)

Mechanical

Enclosure	Cast aluminum, painted
Dimensions	26 x 16 x 9 cm (10.2 x 6.3 x 3.5 in.)
Weight	2.8 kg (6.2 lbs.)
Cable entries	6 glands
Cable diameter	3.0 to 6.5 mm (0.12 to 0.26 in.)

Environmental

Operating temperature	–30 to +75 °C (–22 to +167 °F) **Note:** Below -30 °C (-22 °F) the LCD will not turn on.
Sealing	IP66
Compliance	CE, RoHS

Power

Input power	Battery or external DC voltage
Battery type	2 x Lithium 3.6 V D cell, Xeno XL-205F or equivalent
Battery life	Up to five years (refer to table below)
Battery monitor	Internal battery monitor and critical battery shutdown
External DC input voltage	10 to 30 VDC
Isolation (DC power)	1500 V from DC power input

Battery life (example configurations using all four channels)

Disable acceleration, use velocity and enveloped acceleration only.

Battery life expectancy	Monthly	Daily	Hourly
Up to 5 years	Time waveform (data block lengths: 2 048)	Velocity spectrum (400 lines)	Overall velocity
		Enveloped Acceleration spectrum (800 lines)	Overall Enveloped Acceleration
		Bias voltage check	Temperature
			Tacho speed

Specifications of CMSS 2350T-D2 Sensor

Dynamic

Sensitivity	25 °C (77 °F): 50 mV/g
Sensitivity precision	±5%
Acceleration range	25 g peak
Amplitude non-linearity	1%
Frequency range	±3 dB: 0.3 to 15 000 Hz
Resonance frequency, nominal	30 kHz
Transverse sensitivity	≤5% of axial
Temperature response	±10% sensitivity, –25 to +120 °C (–15 to +250 °F)
Temperature sensitivity	–10.9 mV/°C (–19.6 mV/°F)

Electrical

Power requirements	Voltage source: 3 to 5.5 V Current consumption: < 100 µA
Electrical noise, equivalent g	Broadband: 2.5 Hz to 25 kHz: 660 µg Spectral: 10 Hz: 60 µg/√Hz maximum 100 Hz: 16 µg/√Hz maximum 1 000 Hz: 5 µg/√Hz maximum
Output impedance	< 1 000 Ω
Bias output voltage (BOV)	1.5 V, ±5%
Bias output voltage stability, including temperature effects	1.5 V DC, ±5%
Cable drive capability	20 m (65.6 ft.): CMAC 2350-CABLE-20M, the longest sensor cable (sensor will draw additional current depending on cable load)
Grounding	Case grounded, internally shielded

Environmental

Temperature range	–40 to +120 °C (–40 to +250 °F) operating temperature
Vibration limit	500 g peak
Shock limit	5 000 g peak
Sealing	Hermetic
Base strain sensitivity, maximum	200 µg/µstrain

Physical

Dimensions	See the figure on the following page
Weight	90 g (3.2 oz.)
Case material	316L stainless steel
Mounting	Internal 1/4-28 thread 1/4-28 to 1/4-28 mounting stud and 1/4-28 to M8 mounting adapter provided
Mounting torque	2.9 Nm (24 in. lbs.)
Connections	4-pin M8 connector + Pin: Power (red) S Pin: Signal, acceleration (1.5 V BOV) (white) T Pin: Temperature (green) - Pin: Common (black)
Recommended cable connector assembly	CMAC 2350-CABLE-5M cable 5 m (16.4 ft.) cable with M12 4-pin non-isolated connector CMAC 2350-CABLE-10M cable 10 m (32.8 ft.) cable with M12 4-pin non-isolated connector CMAC 2350-CABLE-20M cable 20 m (65.6 ft.) cable with M12 4-pin non-isolated connector

Agency Approvals

- CE approved
- CSA:
  - Class I, Division 2, Groups A, B, C and D

Dimensions of CMSS 2350T-D2 Sensor

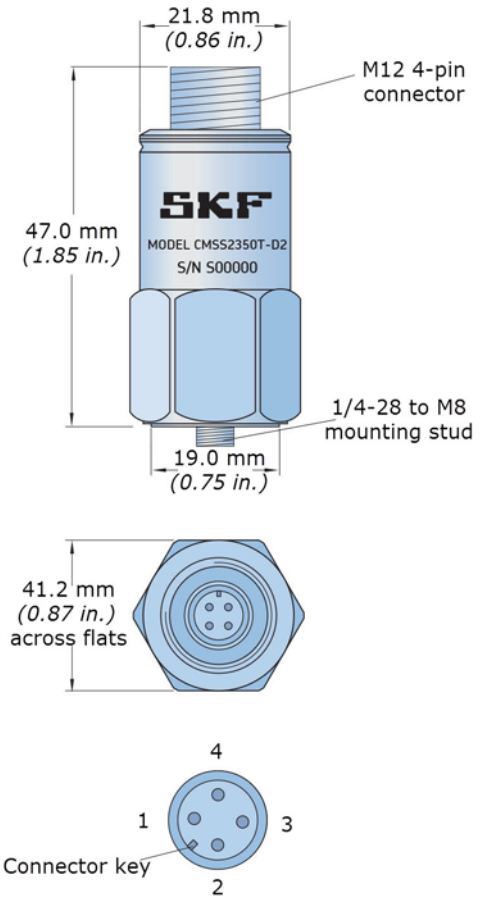


Figure 2 –8.
CMSS 2350T-D2 Sensor Dimensions.

See **Appendix A, Installing the Sensors** in this user manual for detailed procedures of the physical installation.

3
System Setup Checklist

Setup Checklist

The checklist below provides a general guideline to follow when setting up the SKF Multilog WVT system in a OneWireless network.

- For brevity, in this checklist DataController is called "DC" and SKF @ptitude Analyst is called "Analyst."

Step	Done	Task and Reference
1.		Set up the network. *Chapter 4, Setting Up the Network* - Connecting the Network Components
2.		Set up the SKF Multilog WVT. *Chapter 5, Setting Up the WVT* - The Setup Procedure
3.		Use commissioning mode to test the cable and sensor connection. *Chapter 5, Setting Up the WVT* – Commissioning Mode
4.		Install DC. *SKF Multilog On-line System WVT User Manual (P/N 32311900), Chapter 6, DataController Installation*
5.		Configure the DC WDMList tab. *Chapter 7, DataController and XML File Editor* - WDMList
6.		Configure the DC GlobalConfig tab. *Chapter 7, DataController and XML File Editor* - GlobalConfig Tab Overview
7.		Enable the GCI and verify that DC is connected to the WDM. *Chapter 8, DataController and the WDM* - Configuring the GCI Server
8.		Install Analyst. *SKF @ptitude Analyst Installation Manual (P/N 32312400)*
9.		Configure the XML Import in Analyst. *Chapter 9, Configuring the XML Import* - Configuring the XML Import
10.		Upload the Device Description (DD) file to the WDM. *Chapter 4, Setting Up the Network* – Uploading the Device Description File
11.		Provision the SKF Multilog WVT. *Chapter 10, Provisioning the Network Devices* - Provisioning the Network Devices
12.		Verify the local time zone. *Chapter 8, DataController and the WDM* - Verifying the Local Time Zone
13.		Configure the measurement units. *Chapter 8, DataController and the WDM* - Configuring the Measurement Units
14.		Verify the Analyst Transaction Server is running. *Chapter 9, Configuring the XML Import* - SKF @ptitude Analyst Transaction Service
15.		Verify the hierarchy is imported into Analyst. *Chapter 9, Configuring the XML Import* - SKF Multilog WVT in the SKF @ptitude Analyst Hierarchy

4
Setting Up the Network

> ⚠ ***IMPORTANT: If your OneWireless network already exists and is operational, you may skip this chapter and proceed to the next chapter, Setting Up the SKF Multilog WVT.***

Network Setup Overview

In this chapter, we present the basic steps to set up a OneWireless network. For details about the WDM and access point components, refer to the **OneWireless Wireless Device Manager User's Guide**.

- In this User Manual, the term "access point" refers to both FDAPs and the Cisco 1552S Access Point provided in the Honeywell infrastructure.

The basic steps in setting up the network are the following:

- Plan the network to fit your location's needs, considering the maximum number of the SKF Multilog WVTs each routing component is able to connect with (shown in the table below) and other key factors.
- Mount the WDM.
- Connect the WDM and FDAPs through the FDN port. This establishes the Field Device Network (FDN).
- Connect the WDMs and PC through the PCN port. This establishes the Process Control Network (PCN).
- Power up and provision the connected components.
- Configure the PC to communicate with the WDMs.
- Configure the WDMs to communicate through the PCN IP address with the Local Area Network (LAN).

At the end of this chapter, we will also present the procedure for uploading the SKF Multilog WVT Device Description file to the WDM. At that point, the network will be ready and operational for the SKF Multilog WVT devices to be set up and join the network.

Network Planning Considerations

Wireless Communications

- ISA100.11a protocol
- IEEE 802.15.4 radio
- Typically in the plant, the range is:
  CMWA 7910-FCC/IC 300 m (984 ft.)
  CMWA 7910-ETSI 100 m (328 ft.).
  The actual range depends on specific site topology and device placement.

SKF Multilog WVT Capacity Specifications Within a Network

Bear in mind the capacity specifications of the SKF Multilog WVT device within networks, which are summarized in the table below.

Maximum number of SKF Multilog WVT Field Devices connected to an Access Point (Ethernet wired to FDN)	15 SKF Multilog WVT Field Devices
Maximum number of SKF Multilog WVT Field Devices connected to an FDAP Router (wireless)	7 SKF Multilog WVT Field Devices
Maximum number of SKF Multilog WVT connected under an SKF Multilog WVT acting in a Field Router role (the routing SKF Multilog WVT must be a **Line powered unit**). The network could be a linear 4-hop network or a star network. **WARNING!** The WDM web page permits you to enable routing on a battery powered device, but doing so causes the battery level calculation to be inaccurate. Enabling routing will produce an irreversible error in the battery level calculation until the batteries are replaced with a new pair.	3 SKF Multilog WVT Field Devices
Maximum number of SKF Multilog WVT Field Devices connected to a WDM	30 SKF Multilog WVT Field Devices
Maximum number of wireless network hops between an access point and a field device	4 hops
Maximum time for radio firmware upgrade for SKF Multilog WVT	Dependent on bandwidth availability and number of hops: 10 minutes (1 hop) to 90 minutes
Maximum time for application upgrade for SKF Multilog WVT	Dependent on bandwidth availability and number of hops: 40 minutes (1 hop) to 4 hours

The maximum number of SKF Multilog WVTs for each of the routing devices in the table above are accumulative. For example, with two wireless FDAPs that each support the maximum of seven SKF Multilog WVTs, the wired access point could support an additional single wireless SKF Multilog WVT (7+7+1=15).

Benchmark Device Configuration and Limitations

The standard configuration for overalls and trace values for a WVT is shown below.

Overall Values / Hourly Collection	Traces / Daily Collection
All six Overall Values are collected hourly: Velocity Bearing Speed Temperature	Trace Configuration: 400 lines Velocity and Acceleration 800 lines gE spectrum Bias voltage 2048 samples bearing waveform

Limitations

- Trace Upload from Battery Powered Units - When collecting 1600 line FFT acceleration, velocity and bearing with 4096 sample size for acceleration and bearing waveform, it takes at least two hours to upload all four channels. For externally powered units, the upload time is one hour.
- Trace Upload from Battery Powered Units - When collecting 3200 line FFT acceleration, velocity and bearing with 8192 sample size for acceleration and bearing waveform, it takes at least three hours to upload all four channels. For externally powered units, the upload time is two hours.
- For each WDM, out of the maximum of 30 connected SKF Multilog WVTs, there should be no more than 10 SKF Multilog WVTs collecting 3200 line acceleration, velocity and bearing FFTs and 8192 sample acceleration and bearing waveforms for all four channels.
- Some limitations apply to deviating from this benchmark configuration for SKF Multilog WVT devices located in the network under a routing device.
  For example: The user detects an alert and decides to increase the configurations and schedules on four channels of an SKF Multilog WVT. The user is allowed to increase the settings to the following configuration values for any of the two SKF Multilog WVT units (but *not more than two* SKF Multilog WVT units) under any access point or routing device.

  Allowable value increases:

Velocity spectrum	1600 lines (4 averages, Fmax 2.0 kHz)
gE spectrum	3200 lines (2 averages, Fmax 2.0 kHz)
Schedule	Every hour

Connecting the Network Components

Follow the mounting and operating instructions and guidelines provided with your WDM, Access Point and FDAP devices. Establish the physical connections between the components in the sequence presented below.

Prerequisites

Make sure that you have either the power supply (10 ~ 36 VDC) or the specified batteries for the SKF Multilog WVT.

Make sure that you have the Ethernet cables required for connecting the devices.

Mount the SKF Multilog WVT at least 2 m (6.5 ft.) away from the nearest network component with an antenna.

To establish physical connection between the components:

- Mount the WDM according to the instructions provided in the **OneWireless Wireless Device Manager User's Guide**.
- Establish physical connection between the WDM and the FDAP. Connect the Ethernet cable from the FDAP to the FDN port on the WDM. This establishes the Field Device Network (FDN).

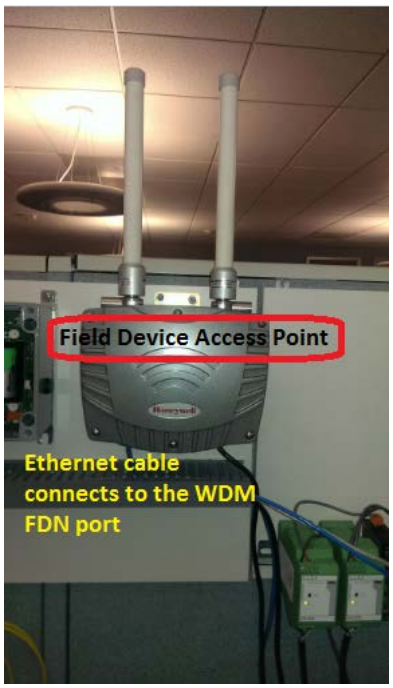


Figure 4 - 1.
Connect the FDAP to the WDM FDN port.

- If you are using multiple FDAPs, you can use an Ethernet switch to connect the FDAPs to the WDM.
- Other FDAPs can be connected wirelessly to the wired FDAP in the ISA100 network infrastructure.

Other acceptable access point devices include the Cisco 1552S Access Point and the Honeywell Multinode, shown below.

Figure 4 - 2.
A Cisco 1552S Access Point and a Honeywell Multinode.

- Next, connect the WDM power cable to a DC power source.
- Establish the physical connection between the WDM and a computer. Connect the Ethernet cable from the computer's network port to the PCN port on the WDM or to a switch connected to the PCN port.

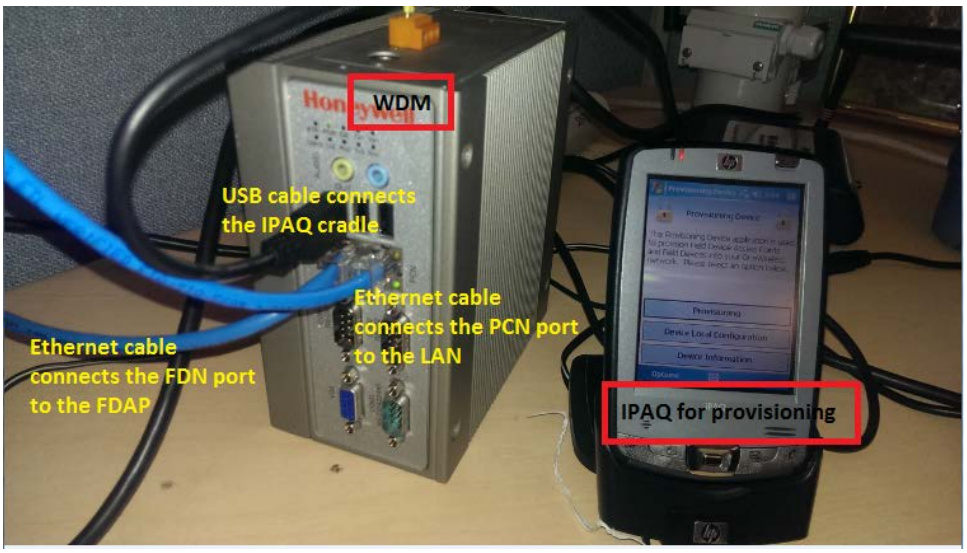


Figure 4 - 3.
WDM Connection to PCN Port.

- Power up the WDM and the FDAP.

IMPORTANT: When powering up the WDM, if a duplicate IP address is configured either on the PCN port or the FDN port, the WDM startup operation ends. To recover, you must resolve the duplicate IP address from the network.

> ⚠ ***WARNING! You must turn on a single WDM at a time at the default address because a second WDM removes itself from the network if a duplicate default address is detected. The removed WDM does not recover unless power-cycled.***

- The access point(s) must be provisioned with the network security keys generated by the WDM in order to actively communicate with the WDM. For details about provisioning the access points, refer to **Chapter 10,** Provisioning the Network Devices, of this user manual.

Configuring the WDM, PCN and FDN Network Properties

Next, you must configure the WDM and PCN network properties. Stated briefly, you will power up the PC on the PCN LAN and configure the PC to connect with the WDM. For the WDM, you will enter the Internet Protocol (IP) address and Port. Then, ping the WDM to confirm the IP address is good.

If the WDM is a new unit or a unit which has returned to factory defaults, the First Time Configuration Wizard will guide you through the WDM configuration process.

Configuring the PC to Communicate with the WDM

Windows XP - Configure the PC to communicate with the WDM:

- On the computer, go to **Start** > **Control Panel** > **Network Connections**.
- Right click the network port connected to the WDM and click **Properties**. The **Properties** dialog opens.
- On the **General** tab, select the **Internet Protocol (TCP/IP)** check box, and then click the **Properties** button. The **Internet Protocol (TCP/IP)** dialog opens.
    - ➢ Write down the current settings in Internet Protocol (TCP/IP) so that you can return to the original values if necessary.
- Configure the **IP address** as 192.168.1.x and **Subnet Mask** as 255.255.255.0.
    - ➢ Do *not* configure the computer with the default IP address of the WDM, 192.168.1.1.
- Click **OK** to close the **Properties** dialog.

Windows 7 - Configure the PC to communicate with the WDM:

- On the computer, go to **Start** > **Control Panel** > **Network and Sharing Center**.
- On the left panel, click the option **Change Adapter Settings**.
- Right click **Local Area Connection** and select **Properties** from the menu. The **Local Area Connection Properties** dialog opens.
- In the **Networking** tab, select **Internet Protocol Version 4 (TCP/IPv4)**. Click the **Properties** button. The **Internet Protocol Version 4 (TCP/IPv4)** dialog opens.
    - ➢ Write down the current settings (if any) so that you can return to the original values if necessary.
- In the **General tab,** select the option button **Use the following IP address**. Enter the **IP address** as 192.168.1.x and **Subnet Mask** as 255.255.255.0.
    - ➢ Do *not* configure the computer with the default IP address of the WDM, 192.168.1.1.
- Click **OK** to close the **Internet Protocol Version 4 (TCP/IPv4)** dialog.
- Click **Close** to close the **Local Area Connection Properties** dialog.

⚠ ***WARNING! You must turn on a single WDM at a time, at the default address because the second WDM removes itself from the network if a duplicate address is detected. The removed WDM does not recover unless power-cycled.***

Configuring the WDM Network Properties

To log on to the WDM user interface:

- Launch an Internet browser.
- Enter the IP address for the WDM in the URL box. To log on to the user interface for the first time from the PCN side of the network, enter the default IP address: https://192.168.1.1.
    - ➢ Microsoft Silverlight 5 plug-in is required on the computer used for accessing the WDM user interface. You will be prompted to install or update Silverlight when you attempt to connect to the WDM only if it is not installed or if the computer has a prior version. A copy of Silverlight is maintained on the WDM for installs and upgrades; no Internet or external connection is required.
    - ➢ If you have connected to the FDN side of the network, enter the default IP address: https://192.168.0.1.

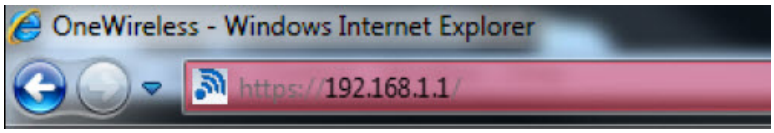


Figure 4 - 4.
Ethernet PCN IP Address.

- If a warning about the security certificate appears, allow the security exception and continue to the website.

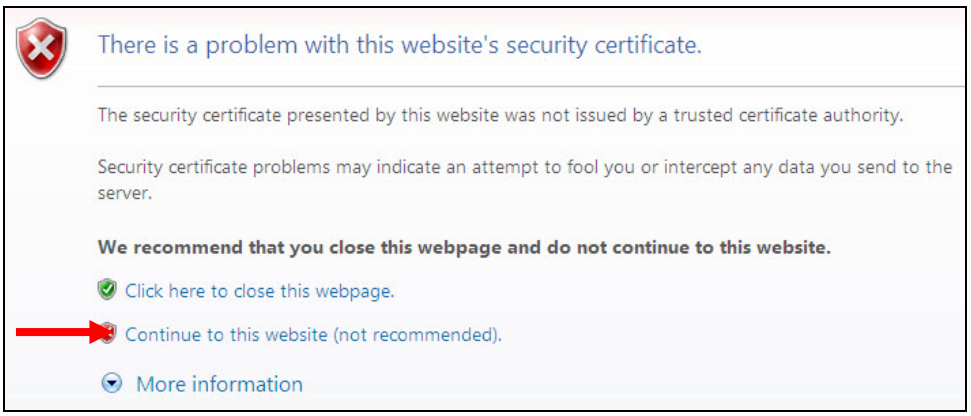


Figure 4 - 5.
Website Security Certificate Warning.

- The **User Login** dialog will appear. In the **User ID** field, enter the default of **administrator**.

Figure 4 - 6.
User Login Dialog.

- In the **Password** field, enter the default of **password**. Note that the **Password** field is case-sensitive.
- Click **Login** to launch the WDM's web page.

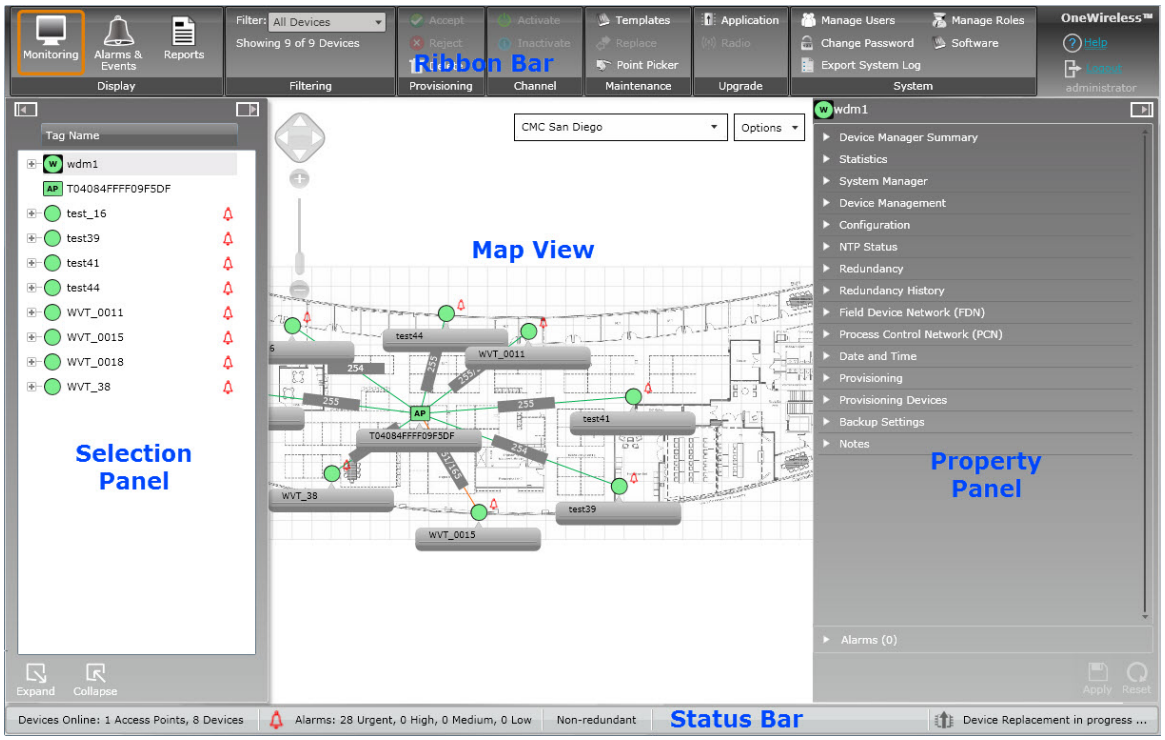


Figure 4 - 7.
WDM User Interface Web Page With Key Section Labels Added.

The Selection Panel on the left lists all of the devices that are configured in the network. The Property Panel on the right contains the configuration properties of all the devices.

- The example above shows an established network web page. At this point in the setup process, only the WDM will display in the Selection Panel and the map view will be blank.
- Refer to the **WDM User Interface User Manual** for information about setting up the site map.

To configure the PCN IP address for the WDM:

- In the Selection Panel, select (highlight) the **WDM**. The Property Panel on the right side will display the properties of the selected WDM.
- Click the white arrow next to **Process Control Network (PCN)** on the Property Panel. The **Process Control Network (PCN)** section will open.

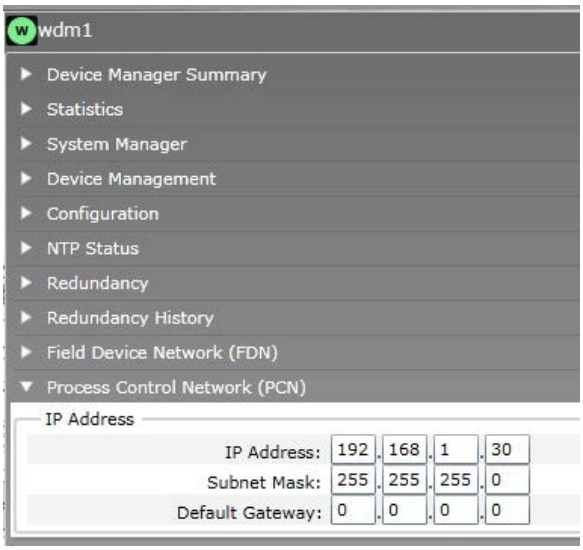


Figure 4 - 8.
Process Control Network (PCN) on the Property Panel.

- Enter the **IP Address** and **Subnet Mask** that are compatible with the site network. You may have to contact your IT department to get a static IP Address for each WDM.
    - ➢ FDN and PCN must be on separate subnets.
    - ➢ Default PCN gateway must be on the same subnet as PCN.
- Click **Apply** at the lower right of the Property Panel to apply the new values.

Figure 4 - 9.
Apply, Lower Property Panel.

- Close the Property Panel by clicking the control element  in the right corner of the panel.

To configure the FDN IP address for the WDM:

- In the Selection Panel, select (highlight) the **WDM**. The Property Panel on the right side will display the properties of the selected WDM.
- Click the white arrow next to **Field Device Network (FDN)** on the Property Panel. The **Field Device Network (FDN)** section will open.

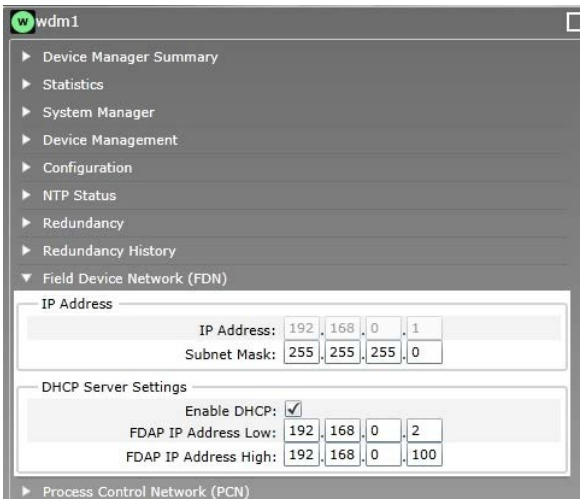


Figure 4 - 10.
Field Device Network (FDN) on the Property Panel.

- Check the **Enable DHCP** checkbox to enable the WDM to act as the DHCP server for the device. With the checkbox selected, the FDAP IP address fields become available for you to configure the DHCP server settings.
    - ➢ If configuring an external DHCP server, do not enable the checkbox. Instead, connect the external DHCP server to the switch.

Dynamic Host Configuration Protocol (DHCP) is a network protocol that enables a server to assign an IP address to a computer from a range of numbers defined by the administrator. DHCP is a protocol that assigns unique IP addresses to devices, then releases and renews these addresses as devices leave and re-join the network.

- If the **Enable DHCP** checkbox is enabled, you must define the range of allowable IP addresses. Enter the values for **FDAP IP Address Low** and **FDAP IP Address High**. The WDM will assign addresses based on the range specified.
    - ➢ The FDN IP address of the WDM (for example, 192.168.0.1 in the figure above) must be outside the DHCP IP address range.
    - ➢ The FDN subnet mask must include FDN IP address and DHCP IP address range.
- Click **Apply** at the lower right of the Property Panel to apply the new values.
- Close the Property Panel by clicking the control element  in the right corner of the panel.

You can now disconnect the WDM from the configuring PC and communicate directly through the LAN.

Next, you are ready to upload the Device Description file to the WDM.

Uploading the Device Description File

About the Device Description File

The Device Description (DD) file is a .ZIP file which is available on the product CD supplied by SKF. The Device Description file for the SKF Multilog WVT is needed by the WDM to understand the device and channel parameters. The Device Description file contains:

- Menus for arranging and grouping parameters of a channel
- Device diagnostic information

When all of the required physical connections between the network components have been established, you will use the WDM user interface to upload the SKF Multilog WVT's Device Description file to the WDM, as described below.

Upload the Device Description File to the WDM

To upload the Device Description file:

- On the ribbon bar of the WDM user interface, in the **Maintenance** group, click **Templates**.

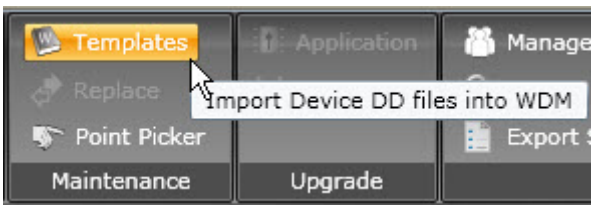


Figure 4 - 11.
Templates Option.

- The **Upload DD File** dialog opens.

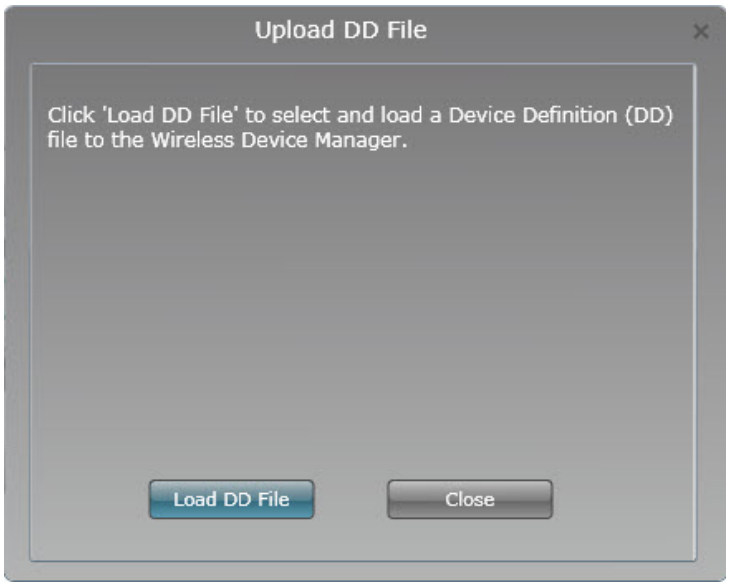


Figure 4 - 12.
Upload DD File Dialog.

- Click **Load DD File**.
- Browse to the directory location of the Data Description file. The file name is ISA100WVT_SKF_20200001.zip, where 2020 is the Model number for the SKF Multilog WVT and 0001 is the Device Revision number.
    - Do *not* unzip the file.
- Select the DD zip file and click **Open**. The DD file is uploaded to the WDM and an upload success message displays.
- Click **Close** to close the **Upload DD** dialog.

If the Data Description file is not uploaded to the WDM when an SKF Multilog WVT device joins the network, then the WDM will select a default Data Description file for the device and you will not see an error message. By using the default Data Description file, you will be able to see only the radio parameters in the WDM user interface. The sensor parameters, such as acceleration, velocity overalls, traces, etc., will not be displayed.

Chapter Summary

To summarize the network setup process, we have:

- Connected the WDM and FDAP through the FDN port. This establishes the Field Device Network (FDN).
- Connected the WDM and PC through the PCN port. This establishes the Process Control Network (PCN).
- Powered up and provisioned the connected components (access points).
- Configured the PC to communicate with the WDM.

- Configured the WDM to communicate through the PCN IP address with the Local Area Network (LAN).
- Configured the WDM to communicate through the FDN IP address.
- Uploaded the SKF Multilog WVT Device Description file to the WDM.

At this point, the network will be operational. In the next chapter, we will set up the SKF Multilog WVT device.

5
Setting Up the SKF Multilog WVT

> ⚠ ***WARNING! Before the SKF Multilog WVT device initially joins the network, the DataController software must be installed and the service running. You will use DataController XML Editor to edit the XML file that initializes the SKF Multilog WVT devices with the site specific global configuration when each device joins the network the first time.***
>
> ***Refer to the next chapters for DataController installation and configuration procedures.***

Chapter Overview

In this chapter, we will present the steps required to prepare and commission the SKF Multilog WVT unit and its sensors. Also provided are instructions for mounting the SKF Multilog WVT unit and remotely mounting the antenna (optional).

The Setup Procedure

The following photo shows the interior of the SKF Multilog WVT with important connectors and components labeled. The SKF Multilog WVT can be used with up to four CMSS 2350T-D2 sensors connected.

> ⚠ ***WARNING! Only the CMSS 2350T-D2 sensor is compatible with the SKF Multilog WVT. Do not attempt to connect a different sensor to the unit.***

- If the SKF Multilog WVT device will not be using all four channels, you should inactivate any channel in the device that is not being used. First, set up the device and provision it to join the network, as described in this user manual. Then, refer to the *Wireless Device Manager (WDM) User Interface User Manual* to see how to inactivate an individual channel.

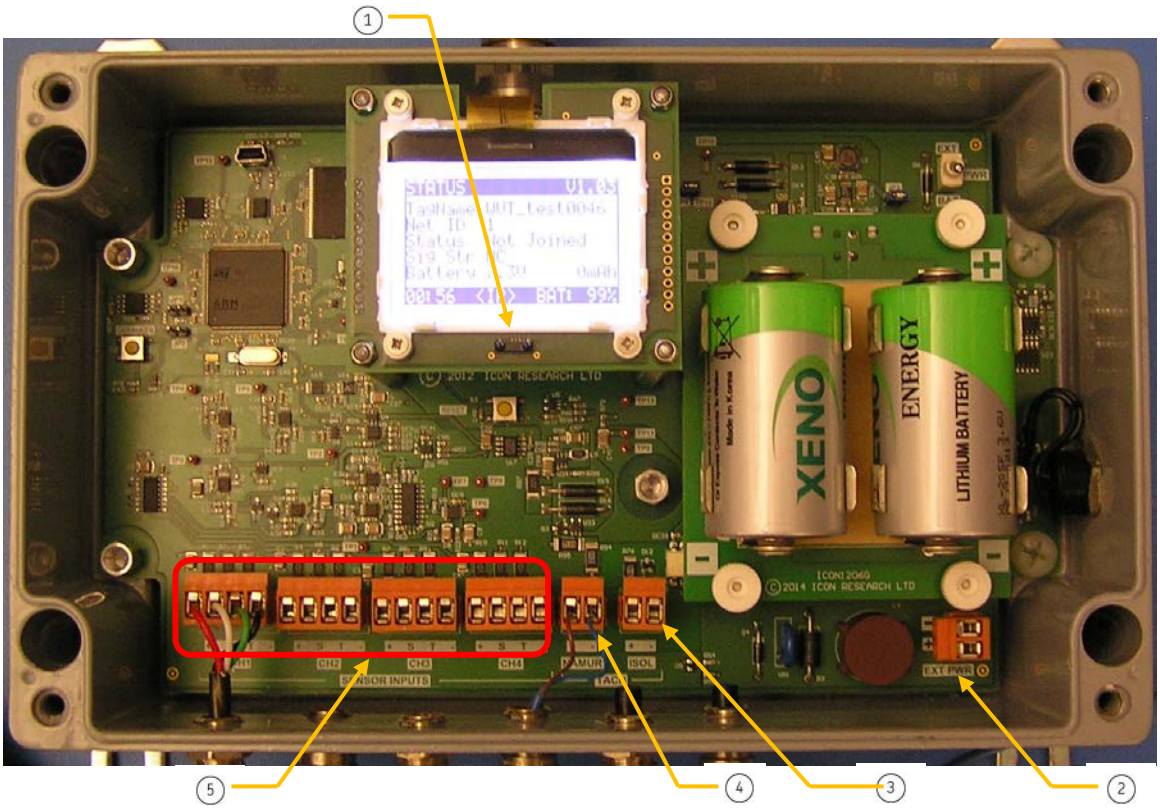


Figure 5 - 1.
SKF Multilog WVT Setup.

1. IrDA port for provisioning
2. External power connector
3. Isolated tacho connector
4. Namur tacho connector
5. Four vibration /temp dual sensor connectors

- Connect to an external power source in the range of 10 to 30 VDC if you are not using battery power.
- Connect the tacho as shown, using either the Namur or the isolated connector.
- Connect each sensor to the SKF Multilog WVT sensor inputs for the appropriate channel. As shown below, the order of the wire colors for each channel, from left to right, are:
  - **+ Pin:** Power (red)
  - **S Pin:** Signal, acceleration (1.5 V BOV) (white)
  - **T Pin:** Temperature (green)
  - **- Pin:** Common (black)

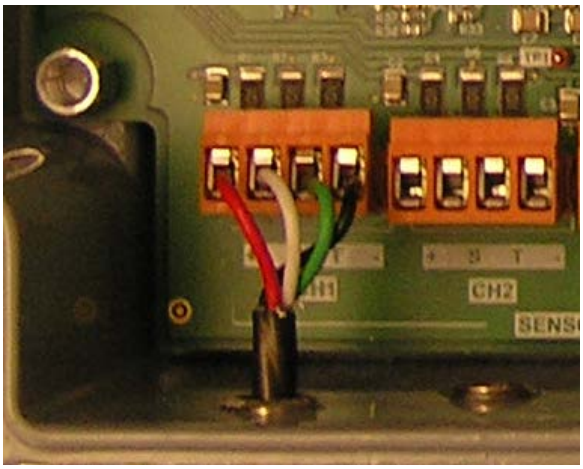


Figure 5 - 2.
Vibration / Temperature Dual Sensor Wiring.

The compatible sensor cable options include:

- CMAC 2350-CABLE-5M, 5 m (16.4 ft.) cable with M12 4-pin non-isolated connector
- CMAC 2350-CABLE-10M, 10 m (32.8 ft.) cable with M12 4-pin non-isolated connector
- CMAC 2350-CABLE-20M, 20 m (65.6 ft.) cable with M12 4-pin non-isolated connector

When the sensors have been connected, you may use Commissioning Mode to test that the sensors are working correctly.

CMWA 7910 Installation Drawing No. G14/0361 for Externally Powered Installations

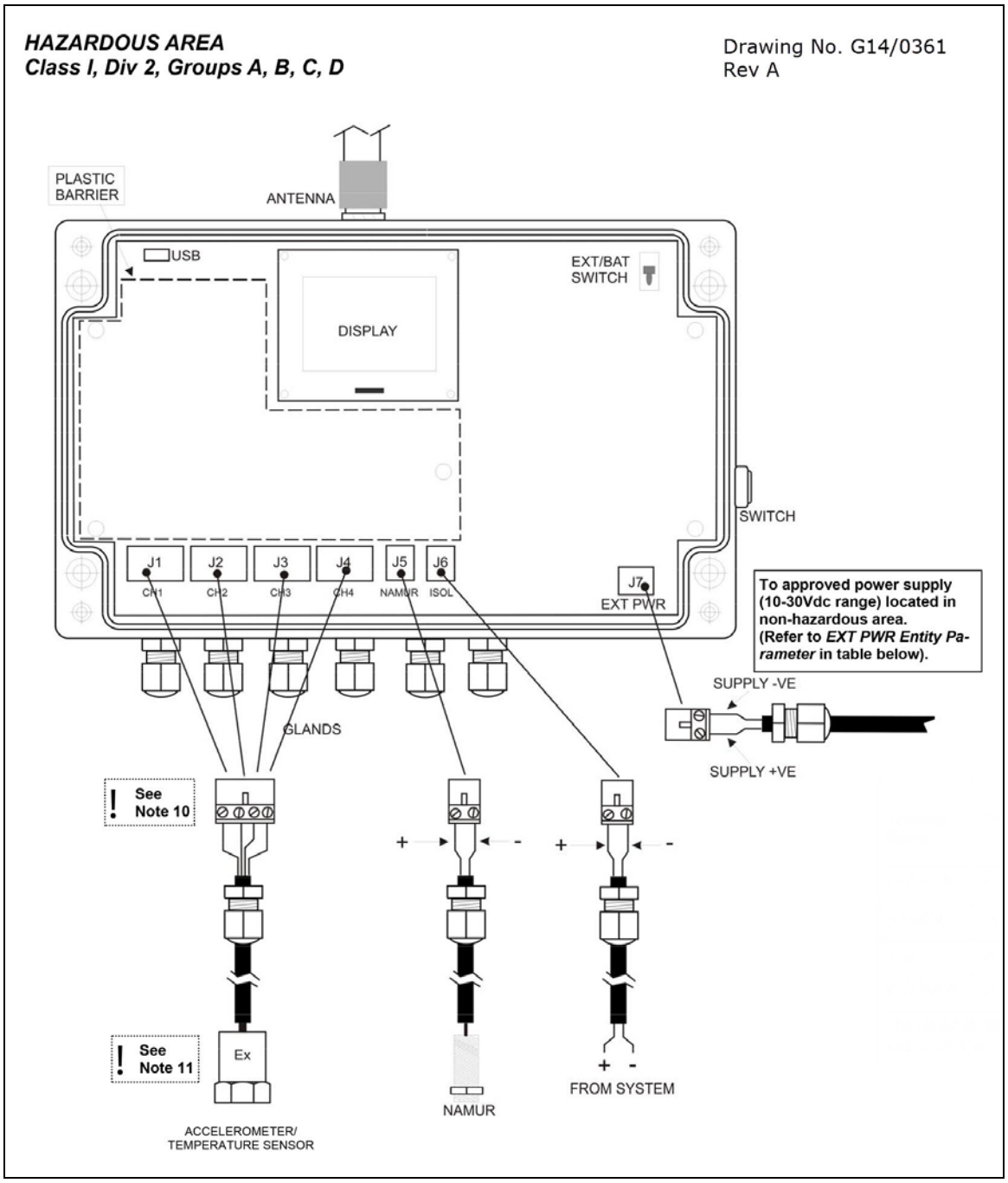


Figure 5 - 3.
CMWA 7910 Installation Drawing No. G14/0361 for Externally Powered Installations.

General Installation Notes

1. This unit may be powered from an external power source in the range 10-30 VDC. *These notes refer to installations where the device is powered from an external power supply.*
2. Connections must adhere to the restrictions defined in the table below, *Entity Parameters*, for each type of signal.
3. Non-incendive sensors may be attached to the device when externally powered, provided that the Entity Parameter criteria are met.
4. The enclosure cover and the transparent plastic barrier must be fitted when the unit is situated in a hazardous area and may not be removed unless the area is known to be non-hazardous.
5. Cable glands must not be substituted for any other type. Use only Hummel gland part number 1.640.1200.50, or Certified alternative.
6. To maintain sealing, unused glands must not be left open. Use gland blanking plugs supplied with the unit, Hummel part number 1.199.1200.50, or Certified alternative.
7. No additional drilling or machining of the enclosure is permitted. All cables must be inserted through one of the installed glands.
8. **WARNING** – substitution of components may impair suitability for Class 1, Div 2.

   AVERTISSEMENT *– substitution de composants peut nuire à la conformité de Classe 1, Division 2*
9. Batteries must not be inserted into the unit when used on external power.
10. For signal inputs, a single channel is shown in this drawing for clarity – additional channels are wired similarly.
11. Sensors are to be certified for use in Division 2 areas. Sensors can only be installed in a Div 2 area and are not to be installed in a Div 1 area.

Terminal Name	Terminal ID	**Entity Parameters**								
		Vmax/ Ui(V)	Imax/ Ii(mA)	Ci (nF)	Li (uH)	Voc/ Uo (V)	Isc/ Io (mA)	Pout/ Po (mW)	Ca/ Co (uF)	La/ Lo (mH)
CH1-CH4	J1,J2, J3,J4	--	--	--	--	5.88	62	365	550	17
NAMUR	J5	--	--	--	--	7.14	38	272	110	45
ISOL	J6	26	100	--	--	--	100	--	--	--
EXT PWR	J7	30	130	0	46.2	--	--	--	--	--
The following criteria must be met for Entity Parameters: Voc or Uo ≤ Vmax or Ui; Isc or Io ≤ Imax or Ii; Po ≤ Pi (if applicable); Ca or Co ≥ Ci + Ccable; La or Lo ≥ Li + Lcable										

CMWA 7910 Installation Drawing No. G14/0360 for Battery Powered Installations

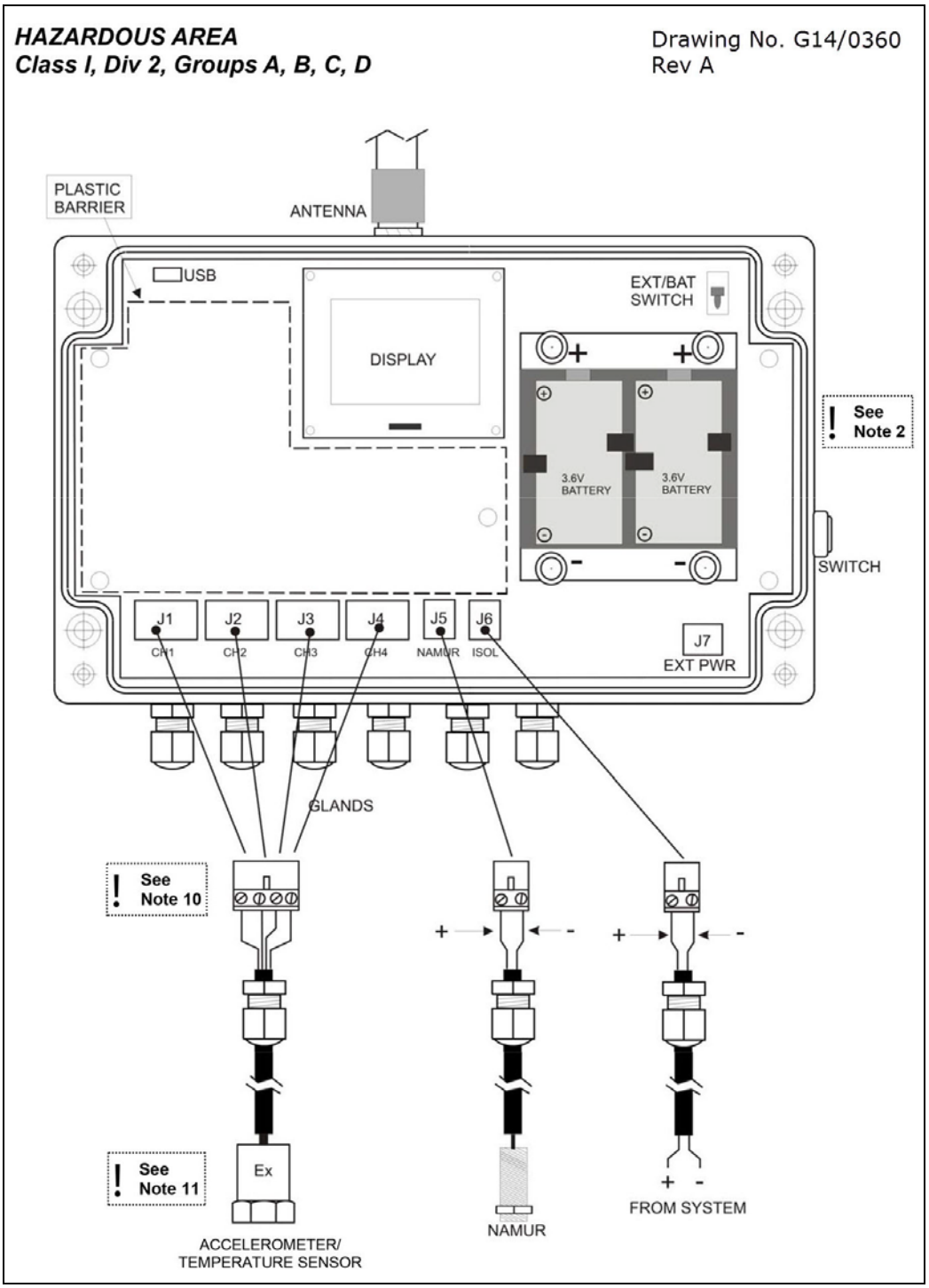


Figure 5 - 4.
CMWA 7910 Installation Drawing No. G14/0360 for Battery Powered Installations.

General Installation Notes

1. This unit may be powered from internally fitted batteries. When using internal batteries, no connection should be made to the external power input. *These notes refer to installations where the device is powered from internal batteries.*
2. Allowed battery types are Xeno XL-205F or equivalent. Two batteries are required. Do not mix battery types. Ensure correct polarity when fitting.
3. Connections must adhere to the restrictions defined in the table below, *Entity Parameters*, for each type of signal.
4. Non-incendive sensors may be attached to the device when battery powered, provided that the Entity Parameter criteria are met.
5. The enclosure cover and the transparent plastic barrier must be fitted when the unit is situated in a hazardous area and may not be removed unless the area is known to be non-hazardous.
6. Cable glands must not be substituted for any other type. Use only Hummel gland part number 1.640.1200.50, or Certified alternative.
7. To maintain sealing, unused glands must not be left open. Use gland blanking plugs supplied with the unit, Hummel part number 1.199.1200.50, or Certified alternative.
8. No additional drilling or machining of the enclosure is permitted. All cables must be inserted through one of the installed glands.
9. **WARNING** – substitution of components may impair suitability for Class 1, Div 2.

   AVERTISSEMENT *– substitution de composants peut nuire à la conformité de Classe 1, Division 2*
10. For signal inputs, a single channel is shown in this drawing for clarity – additional channels are wired similarly.
11. Sensors are to be certified for use in Division 2 areas. Sensors can only be installed in a Div 2 area and are not to be installed in a Div 1 area.

Terminal Name	Terminal ID	**Entity Parameters**								
		Vmax/ Ui(V)	Imax/ Ii(mA)	Ci (nF)	Li (uH)	Voc/ Uo (V)	Isc/ Io (mA)	Pout/ Po (mW)	Ca/ Co (uF)	La/ Lo (mH)
CH1-CH4	J1,J2, J3,J4	--	--	--	--	5.88	62	365	550	17
NAMUR	J5	--	--	--	--	7.14	38	272	110	45
ISOL	J6	26	100	--	--	--	100	--	--	--
The following criteria must be met for Entity Parameters: Voc or Uo ≤ Vmax or Ui; Isc or Io ≤ Imax or Ii; Po ≤ Pi (if applicable); Ca or Co ≥ Ci + Ccable; La or Lo ≥ Li + Lcable										

Commissioning Mode

Normally, the bias voltage, temperature and tachometer speed are only updated in the unit after the first scheduled data collection. The commissioning mode allows you to check the correct connection of the sensors and the tacho device immediately after they are connected, independent of the collection schedule.

To put the SKF Multilog WVT into Commissioning Mode, insert a jumper into position JP2 on the left side of the main board, and then press the LCD display push button on the outside of the unit. The sign-on message COMMISSIONING appears in the display title bar at the top. The device then reads the bias voltage and temperature on each channel in turn.

Figure 5 - 5.
Commissioning Mode Display.

A correctly connected sensor should read 1.5 V in the BIAS column and the correct temperature in the ºC column. A value of 3.0 V in the BIAS column indicates that the sensor signal is open circuit. A value of approximately 55 ºC indicates that the temperature input is not connected.

If a tacho device is connected and the machine is running, machine speed will be reported under RPM. A value of zero indicates that no pulses are being received. To check a tacho device manually when a machine is not running, TRIG HIGH or TRIG LOW is reported on the screen when a target is absent or sensed by the tacho sensor. Note that the Namur sensor requires a ferrous metal object.

⚠ ***IMPORTANT: When you are done commissioning the sensors, be sure to remove the jumper from position JP2. This will return the SKF Multilog WVT to normal operating mode.***

⚠ ***WARNING! After commissioning, remove power to the SKF Multilog WVT and do not apply power until it is time to provision the device into active service in the network. This will prevent incorrect initialization before the global configuration is specified by the user and conserve the battery (if battery powered).***

Mounting and Dimensions

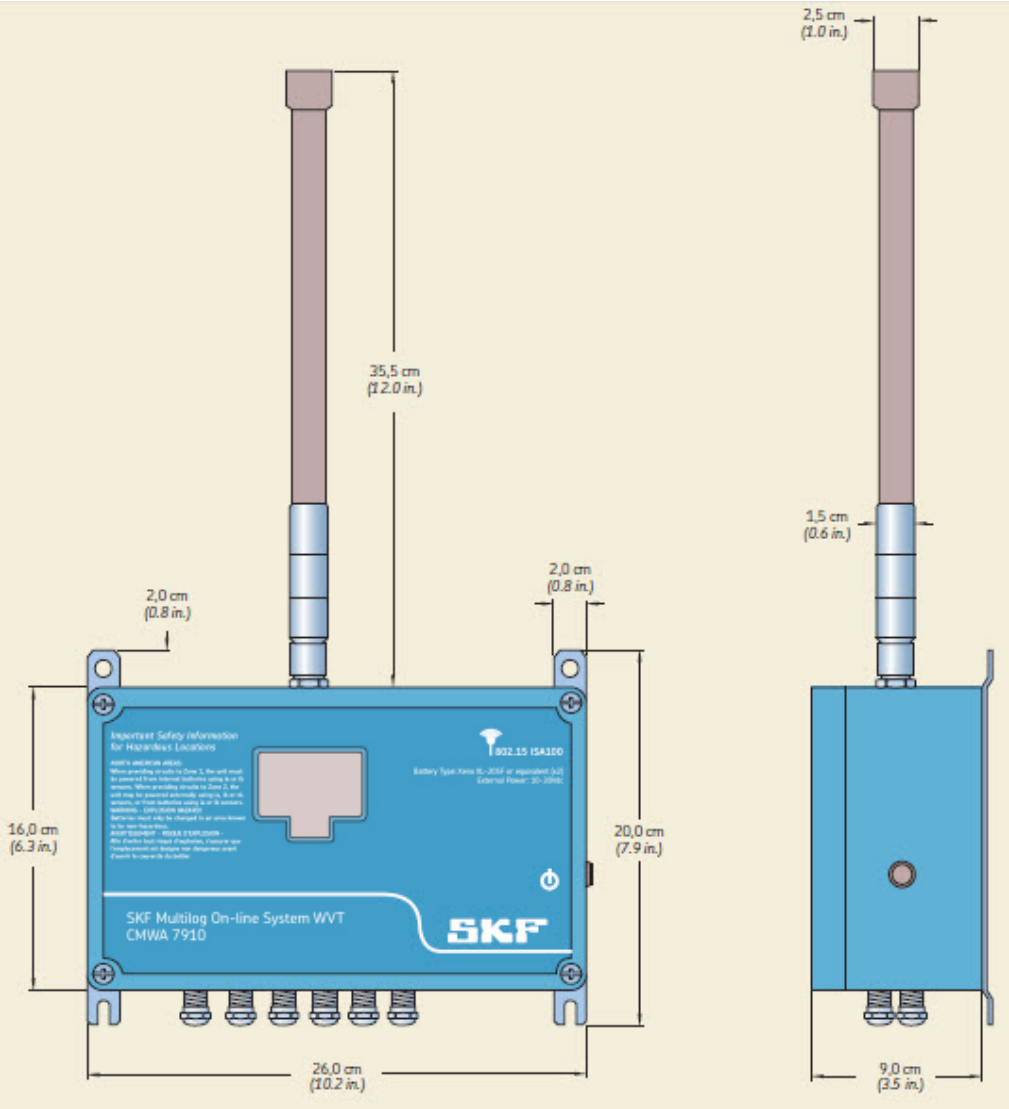


Figure 5 - 6.
SKF Multilog WVT Dimensions.

> ⚠ ***WARNING! Mount the SKF Multilog WVT at least 2 m (6.5 ft.) away from the nearest SKF Multilog WVT or FDAP. Mounting the units too close together may result in dropped network links or possible failure of the radio card.***

- This product is designed to mount on a flat surface.
- There should be enough clearance to access the push button on the right side.
- Replace unused glands with the blanking plugs provided, according to the hazardous area installation instructions.
- Tighten glands and blanking plugs to 4 N-m (35 lb.-in.) torque to maintain the IP rating.

Mounting the External Antenna

The antenna can be mounted remotely with an additional coaxial cable (sold separately) and the optional SKF Remote Antenna Mounting Kit P/N CMAC 7820-MK, or your own hardware.

Additional coaxial cables are available in three different lengths:

- 1 m (3.3 ft.) P/N CMAC 7820-EXTCBL-1M
- Or 3 m (9.8 ft.) P/N CMAC 7820-EXTCBL-3M
- Or 10 m (32.8 ft.) P/N CMAC 7820-EXTCBL-10M
    - Cable connector types: one end is N Type Crimp Plug Nickel (male) and the other end is N Type Crimp Jack Nickel (female)
    - Cable Attenuation: 0.42 dB/m at 2.5 GHz

To facilitate mounting, the SKF Remote Antenna Mounting Kit P/N CMAC 7820-MK contains the following items:

- 1 ea Antenna Mounting Bracket (P/N 32296200)
- 2 ea U-bolt Clamps (P/N 10981400)

Figure 5 - 7.
Mounting Kit Bracket and U-bolt Clamp.

The following figure shows an external antenna mounted remotely to a pole.

Figure 5 - 8.
External Antenna Mounted to Pole.

⚠ ***WARNING! EXPLOSION HAZARD! Connection and disconnection of cables and antennas may cause a spark that can ignite a potentially explosive atmosphere. Connect or disconnect cables and antennas only in the absence of a potentially explosive atmosphere.***

⚠ ***WARNING! LIGHTNING STRIKE DAMAGE HAZARD! With outdoor mountings, install surge protectors to help guard devices against lightning strike damage. Avoid installation and maintenance during thunderstorms.***
Only trained, qualified personnel should carry out mounting and installation of the remote antenna and related accessories.

If the antenna is mounted outdoors, you should include a surge protector in the installation. While a surge protector will shield the device against a lightning strike, it does so at the cost of some loss of in the radio signal strength usually specified in dB in the surge protector's data sheet. The loss should be taken into account in the link budget calculation.

When a surge protector is used, two sections of coaxial cable are required. Follow the installation instructions given by the manufacturer of the surge protector. The diagram below illustrates the installation setup.

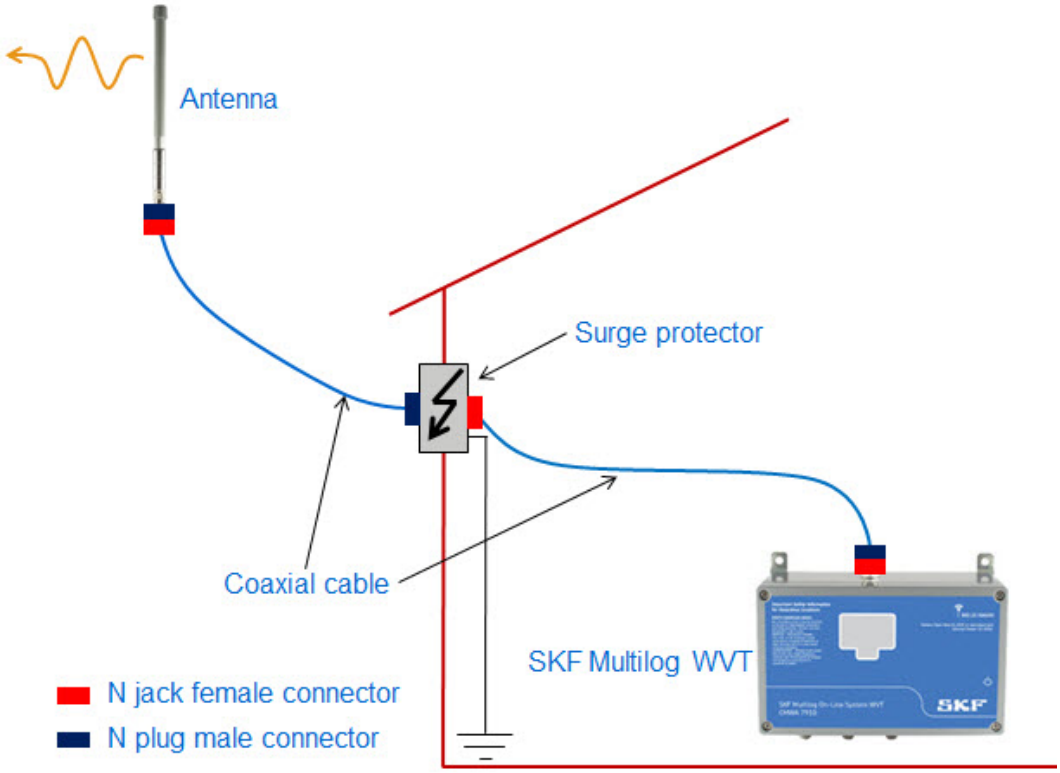


Figure 5 - 9.
Antenna Installation Diagram.

To remotely mount the external antenna:

- Connect the external antenna plug connector to the N jack connector on the coaxial cable selected (1 m, 3 m or 10 m in length).
    - ➢ We recommend applying a tiny amount of silicone grease to the inside of the antenna plug connector to cover the center pin. Then, screw the plug connector into the cable connector. Use the silicone grease for the other connections in this procedure.

> ⚠ ***WARNING! Make sure to use silicone grease that is rated for "electrical" or "electronic" applications. Other types can be corrosive.***
> ***Avoid getting any silicone grease on the outside of the connector. If you do, scrub it off with a dry tissue. The self-amalgamating tape will not stick to itself if it becomes greasy.***

Next, apply the self-amalgamating tape to the antenna connector to provide additional protection from the environment. Follow the steps below.

- Peel the plastic coating from one side of the tape, starting at a corner.
- Starting at the downward side of the cable, hold the tape so its farthest edge is about 40 mm (1.5 in.) from the connector.

- Stretch the tape and maintain the tension while tightly spiraling the tape upward with a 50% overlap so that the tape sticks to itself. Spiral upward so that the turns are stacked like shingles on a house with their seams pointed downward.
- Continue to stretch and wind the tape until the joint is completely sealed and then terminate the tape directly to the metal antenna connector. Cut off any excess tape while still maintaining the tension.
- Press down hard on the entire seal until the self-bonding is complete. This takes only seconds.
- For additional weather protection, you may apply regular electrical tape over the self-amalgamating tape. Apply the electrical tape in the same fashion, spiraling from the bottom upward and terminating on the antenna connector.
- Secure one plane of the mounting bracket to a pole or wall.
    - ➢ If mounted to a wall, the antenna must be at least 16 cm (6 in.) from the wall surface. The mounting bracket provided in the kit accommodates this requirement.
- Secure the antenna to the opposite plane of the mounting bracket using the two included U bolts.
- If a surge protector is not used, connect the coaxial cable's N plug male connector to the unit's N jack female antenna connector. Tighten the retaining nut to 5 N-m (44 lb.-in.) torque to maintain the IP rating.
    - ➢ If a surge protector is used, connect the first coaxial cable to the surge protector instead. Then, connect the second coaxial cable to the unit's antenna connector.

Figure 5 - 10.
Antenna Connector Retaining Nut.

- Apply the self-amalgamating tape to all joints that are outdoors. Be sure to spiral the tape upwards, applying it in the manner described above. You may follow with electrical tape for additional protection, as described above.

⚠ WARNING! After commissioning, remove power to the SKF Multilog WVT and do not apply power until it is time to provision the device into active service in the network. This will prevent incorrect initialization before the global configuration is specified by the user and conserve the battery (if battery powered).

Chapter Summary

To review the SKF Multilog WVT device setup process, we have:

- Connected the four sensors to the unit.
- Connected the tacho to either the Namur or isolated connector.
- Connected to either an external power source or installed the batteries and set the PWR switch to correspond.
- Used commissioning mode to test that sensors are working correctly.
- Mounted the SKF Multilog WVT device.

At this point, DataController must be installed to configure the SKF Multilog WVT devices before they join the network; refer to **Chapter 6, DataController Installation**, and **Chapter 7, DataController and XML File Editor**, of this user manual.

6
DataController Installation

Before the SKF Multilog WVT devices can join the OneWireless network, DataController must be installed and the global configuration parameters for the devices must be specified. (The End User License Agreement is provided at the beginning of this user manual.) The next few chapters of this user manual address the critical activities to be performed with DataController.

DataController Overview

DataController software is found on the product CD. DataController consists of a background service and two applications that are both installed from one installation application:

- **XML File Editor** – This user interface enables the editing of three XML files critical to the operations of the SKF Multilog WVT. This is discussed in detail in the next chapter of this user manual.
- **Service Manager** – This is the user interface that starts and stops the Windows service application that runs in the background. This service application is discussed in the present chapter. You start the service after you have set up the global configuration parameters and before the first SKF Multilog WVT device joins the network. The service will initialize each SKF Multilog WVT device as it joins the network with the global configuration and use the data collection schedule to retrieve measurement data from the SKF Multilog WVT. As long as the service is running, data collection occurs even if the user logs off the computer. The collected measurements are automatically exported to the Analyst database.
- **Background Service** - Initializes each SKF Multilog WVT (in factory default state) with the global configuration as it joins the network. The service uses the data collection schedule to retrieve measurement data from the SKF Multilog WVT. As long as the service is running, data collection occurs even if the user logs off the computer. The collected measurements are automatically exported to the Analyst database.

You start the service after you have set up the global configuration parameters and before the first SKF Multilog WVT device joins the network.

Specifications and Features of DataController

- Communicates with a maximum of eight WDMs.
- Communicates with a maximum of 240 SKF Multilog WVT devices (up to 30 SKF Multilog WVT devices per WDM).
- Configures SKF Multilog WVT devices from default factory state to user-specified configuration data using the GlobalConfig file.

- Collects time wave and spectrum data from all four channels of SKF Multilog WVT devices at user-configured periods for all the possible measurements: acceleration, velocity and bearing.
- Collects trend values (or Process Value, PV) from all four channels of SKF Multilog WVT devices at user-configured periods for all the possible measurements: acceleration, velocity, bearing, speed, bias voltage and temperature.
- Provides the collected time wave, spectrum data and trend values to SKF @ptitude Analyst for data analysis.

DataController Prerequisites

Hardware Requirements

Desktop or laptop with 1 GB RAM or more and at least 10 GB free hard disk space for installing the OneWireless user interface.

A PC with Web browser for accessing the the OneWireless user interface. The same desktop or laptop having DataController can also be used.

> ➢ If DataController output files are placed in the same machine and SKF @ptitude Analyst is not consuming those XML files, the hard disk space might quickly run out (within a few days). Please sure you have the recommended hard disk space.

OneWireless R220 release or later.

Software Requirements

Windows operating system with Windows 7, Windows XP (Service Pack 1, 2 and 3) or Windows Vista.

Microsoft .NET Framework 4.

Desktop/Server grade computer or laptop with SKF @ptitude Analyst installed.

> ➢ SKF @ptitude Analyst and DataController machines can be the same or different depending on the requirement.

Installing DataController

To install DataController:

- Double-click the DataController.msi icon in the DataController installation media. The **Welcome to the DataController Setup Wizard** appears.

Figure 6 - 1.
DataController Icon.

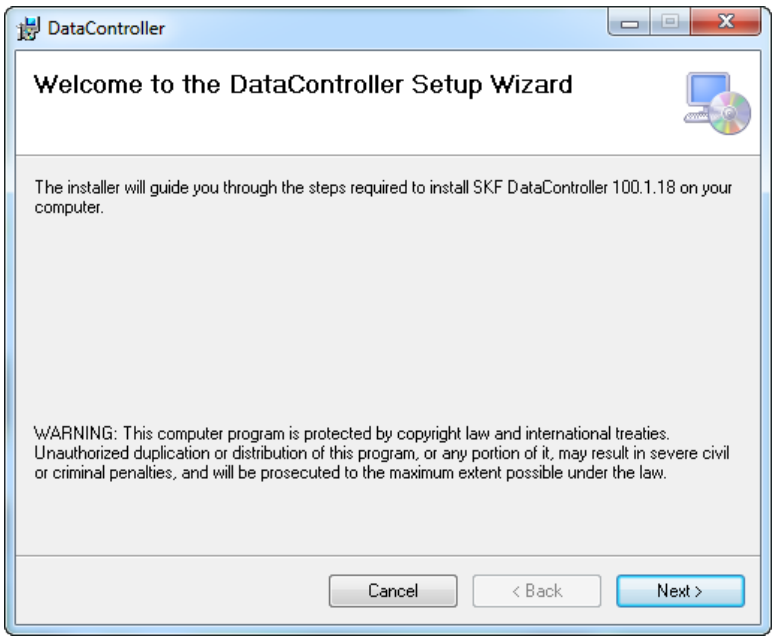


Figure 6 - 2.
DataController Setup Wizard – **Welcome** Window.

- Click **Next**. The **Select Installation Folder** window appears.

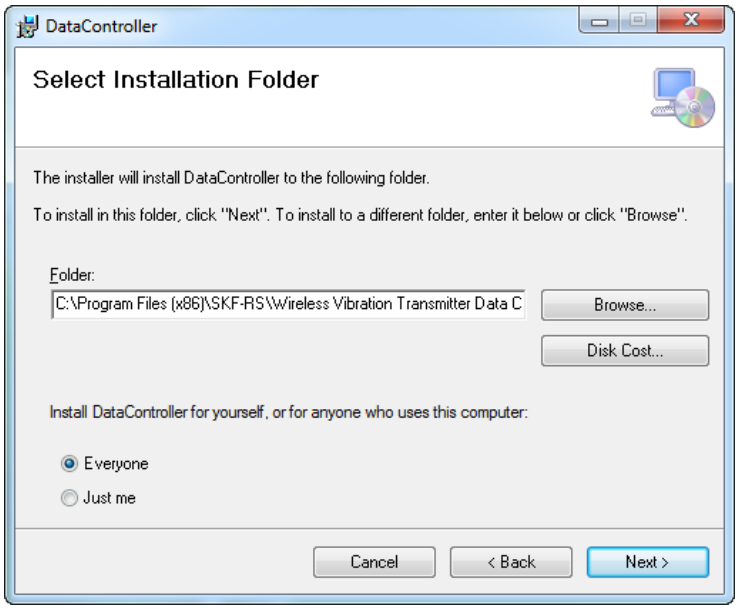


Figure 6 - 3.
DataController Setup Wizard – **Select Installation Folder** Window.

- Click **Browse** to specify the installation path. Using the default path is recommended.
- Click **Everyone** or **Just me**, as appropriate.
- Click **Next**. The **Confirm Installation** window appears.

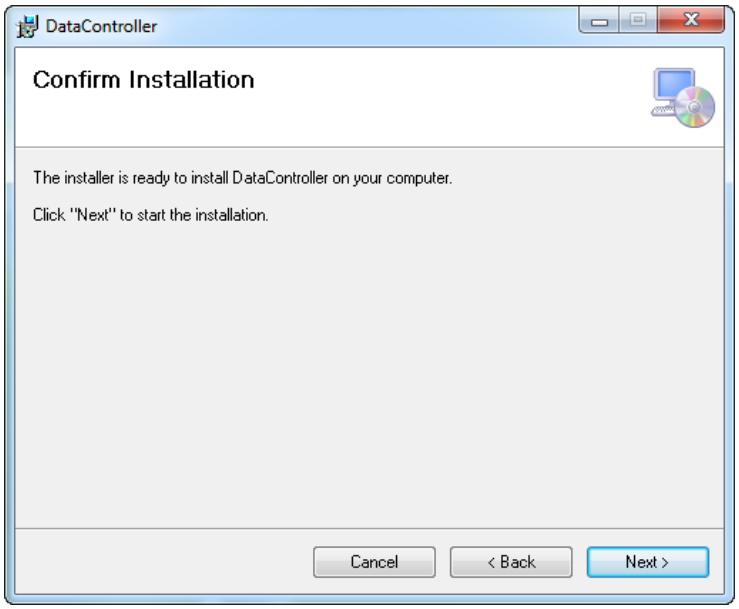


Figure 6 - 4.
DataController Setup Wizard – **Confirm Installation** Window.

- Click **Next**. The **Installing DataController** window appears very briefly, showing the progress of the installation process.

- The **Installation Complete** window appears.

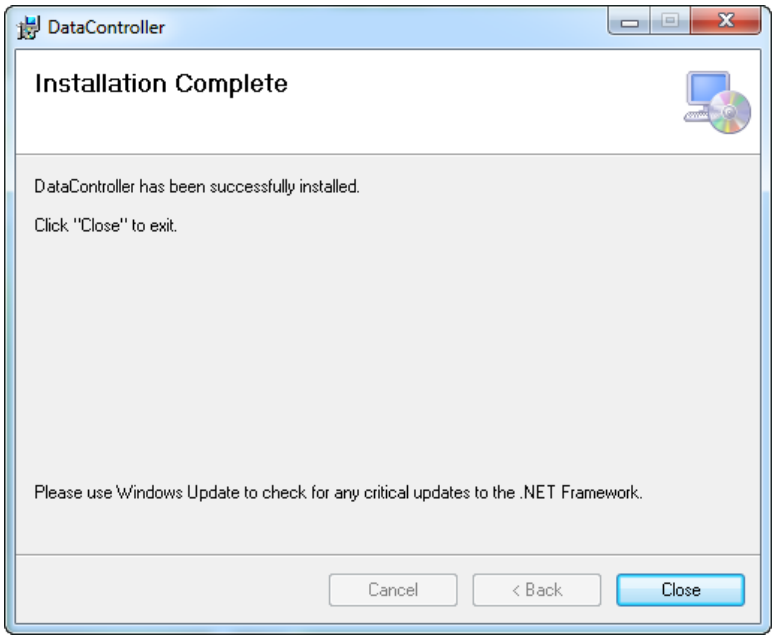


Figure 6 - 5.
DataController Setup Wizard – **Installation Complete** Window.

- Click **Close**. After installation is complete, verify that DataController appears as a Windows service. Go to **Start** > **Control Panel** > **Administrative Tools** > **Services** to check for DataController in the list.

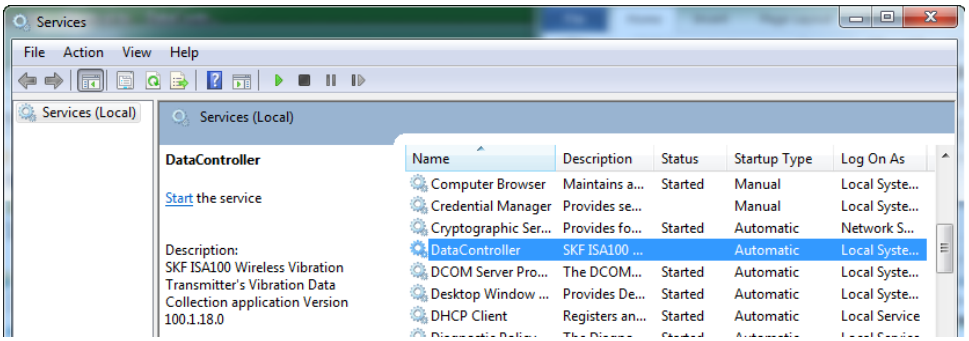


Figure 6 - 6.
DataController in the **Services** List.

Launching ServiceManager

To launch ServiceManager:

- You can start and stop the DataController service by using the **Service Manager** shortcut present on Windows Start menu. Go to **SKF > DataController** on the Windows Start menu and click **ServiceManager**.

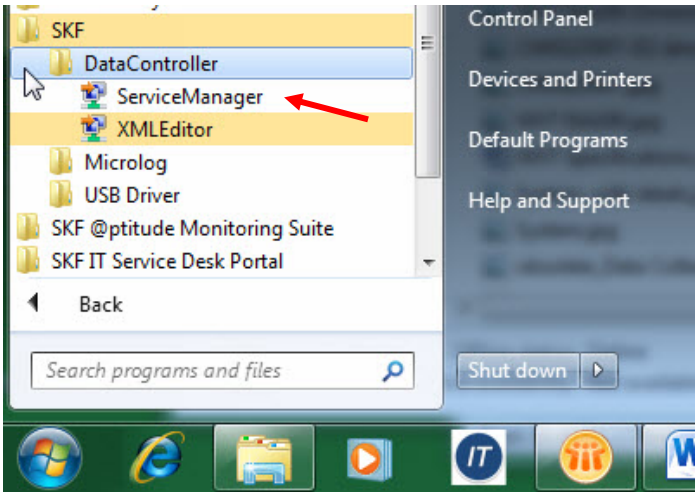


Figure 6 - 7.
DataController **Service Manager** in the Windows **Start** Menu.

- Click **ServiceManager** to launch the **DataController ServiceManager** control console. You can start or stop the DataController service by using the control console.

Figure 6 - 8.
DataController ServiceManager Console - **Start**.

- Click the **Start** button. You should see the message "DataController is Running."

You can also use Windows Task Manager to confirm that DataController is running.

- Start **Task Manager**. View the **Applications** tab or the **Processes** tab.

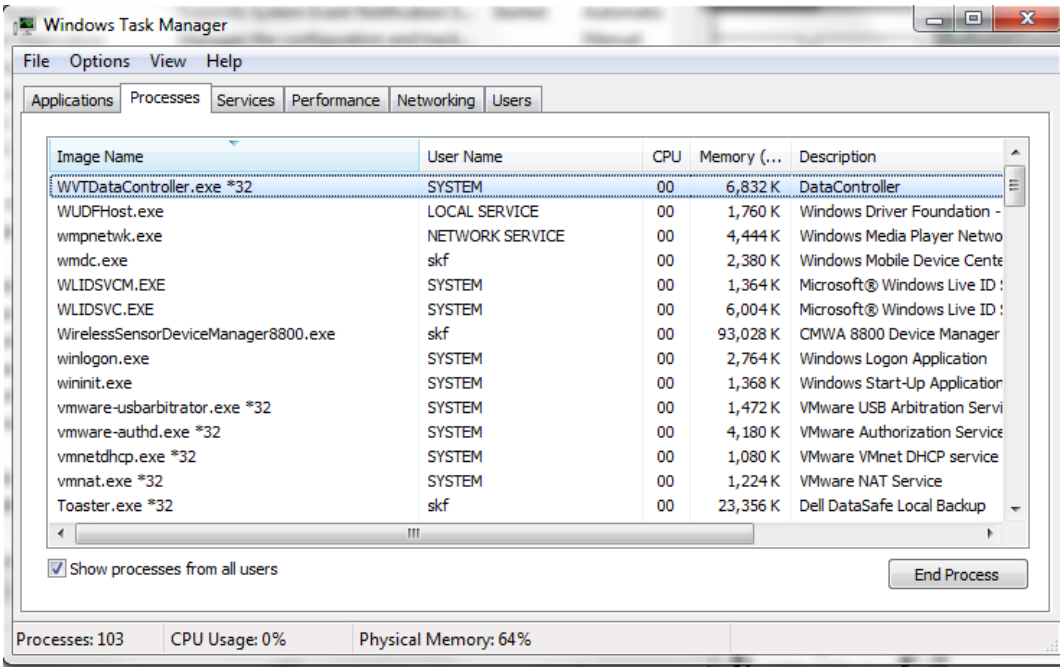


Figure 6 - 9.
Windows Task Manager Showing DataController Service is Running.

The presence of the DataController service in the list of applications and processes in Task Manager confirms that the service is running. Remember, it will keep running even if the user logs off.

- Click the **Stop** button to stop running the DataController service. You should see the message "DataController is Stopped."

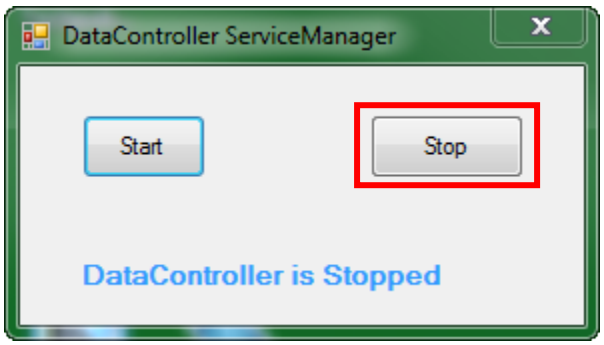


Figure 6 - 10.
DataController ServiceManager Console - **Stop**.

- ➢ You may click the Close (X) button in the upper right corner to close the dialog and the service will continue running.
- ➢ If modifications are made to the global configuration parameters or the data collection schedule after the SKF Multilog WVT device is in operation, the new settings will not become effective until the DataController service has been stopped and restarted.

Removing DataController

If you need to remove (uninstall) DataController from the computer, follow the steps below.

- From the **Start** menu, click **Control Panel**. The **Control Panel** opens.
- Double-click **Add or remove Programs**. The **Add and Remove Programs** screen opens.
- From the list of installed programs, select **DataController** and click **Remove**.

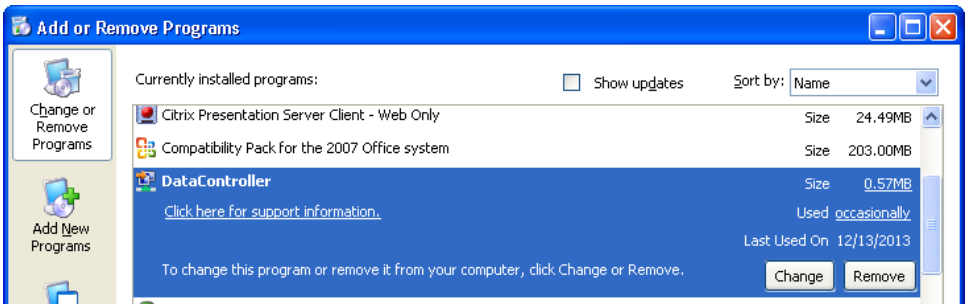


Figure 6 - 11.
Add or Remove Programs Screen.

- The **Add or Remove Programs** dialog displays for you to confirm the removal. Click **Yes**.

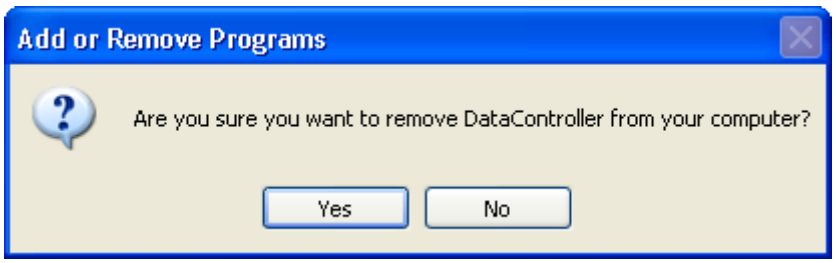


Figure 6 - 12.
Add or Remove Programs Dialog.

The **Uninstalling DataController** dialog opens to display the progress. You may still cancel the action at this point.

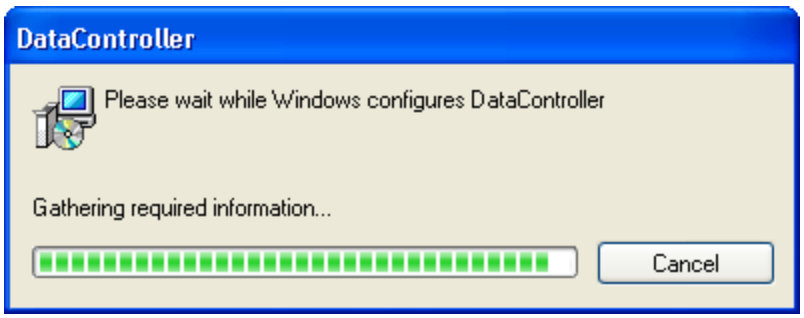


Figure 6 - 13.
Uninstalling DataController Dialog.

On completion, DataController is removed from your computer.

Chapter Summary

To summarize the activities in this chapter, we have:

- Installed DataController.
- Launched Service Manager and confirmed the service is running.
- Seen how to remove DataController.

In the next chapter we will use XML File Editor in DataController to configure the SKF Multilog WVT.

7
DataController and XML File Editor

Configuring the SKF Multilog WVT with XML File Editor

DataController XML File Editor provides three tabs to edit three XML files, listed below. The first two accomplish the initial configuration of the SKF Multilog WVT in the network and are discussed in detail in this chapter. The third is discussed later in **Chapter 11, Modifying the Data Collection Schedule**.

- **WDMList.xml** – configures the WDM Internet Protocol (IP) addresses and Transmission Control Protocol (TCP) ports which DataController will use to connect with the WDMs.
- **GlobalConfig.xml** – configures the common global default settings of the SKF Multilog WVT devices. These settings are downloaded to the devices when they join the network in their factory default state.
- **SpectrumCollectNvs.xml** – configures DataController's schedule for collecting the trace spectra and time waves. This file is not created until after the first trend data has been taken from the SKF Multilog WVT.

During the installation of DataController, the first two XML files are automatically created and saved in the same place in the installation path where DataController is installed. The default location of the WDMList.xml and GlobalConfig.xml files is C:\Program Files (x86)\SKF-RS\Wireless Vibration Transmitter Data Controller – 7910.

The file SpectrumCollectNvs.xml is created later when the SKF Multilog WVT has taken data. The default path is C:\Temp\DataController\Config.

Launching XML File Editor

You will launch XML File Editor to perform the initial configuration of the SKF Multilog WVT.

> ⚠ ***WARNING! DataController works only in administrator mode in Windows 7 unless you are running in XP compatible mode.***

To launch XML File Editor:

- Go to **Start** > **SKF** > **DataController** and click **XMLEditor**. XML File Editor opens on the **WDMList** tab.

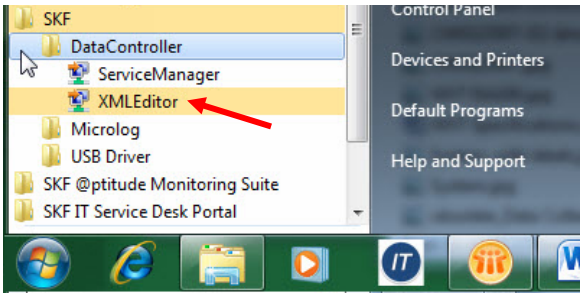


Figure 7 - 1.
DataController **XMLEditor** in the Windows **Start** Menu.

WDMList

DataController needs to know the IP address and the TCP Port number of each WDM in order to communicate with them over Ethernet to the PCN port of each WDM. The file WDMList.xml contains the list of WDMs, their IP addresses and the TCP port numbers, which will be parsed by DataController during service startup and communication with the WDMs.

- Recall that each instance of DataController can communicate with a maximum of eight WDMs.

⚠IMPORTANT: The IP address and TCP Port entered in WDMList must match exactly the PCN IP address and the the Gateway Client Interface Server TCP Port in the WDM configuration.

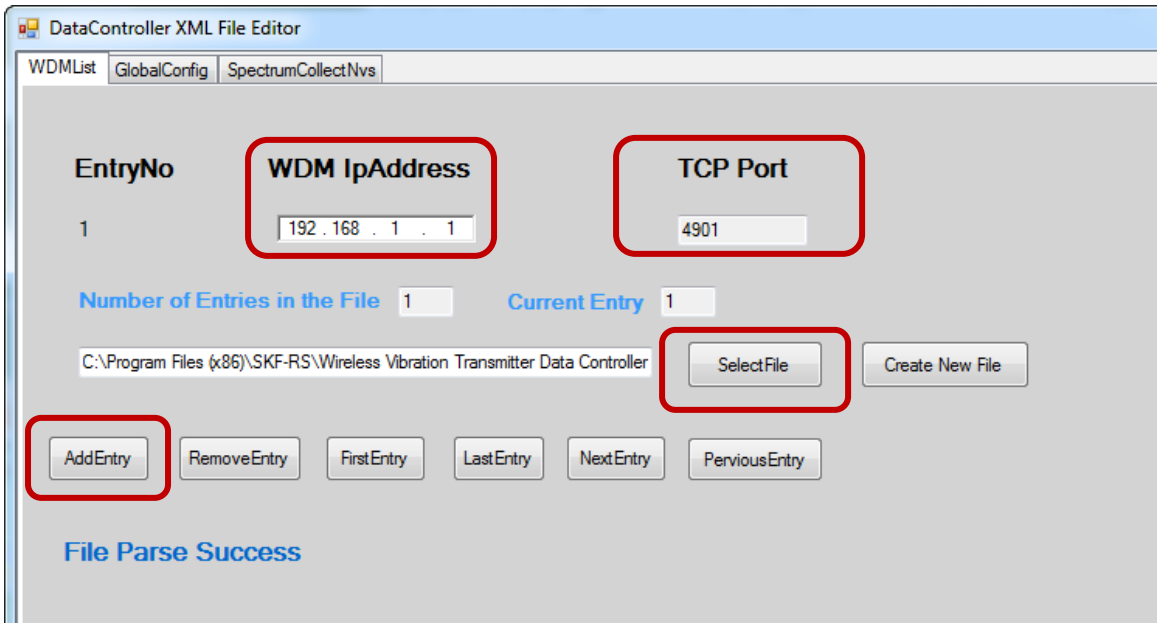


Figure 7 - 2.
WDMList Tab.

To edit the WDMList tab:

- Click **SelectFile** and browse to the location of the desired WDMList.xml file. Edits made within the tab will update the selected xml file.
- Enter the **WDM IP Address** for each new WDM in your system.

To find the WDM's IP Address, go to the WDM's user interface web page and select the WDM in the Selection Panel. Then, open Process Control Network (PCN) in the Property Panel. The WDM's IP Address will be displayed, as shown below.

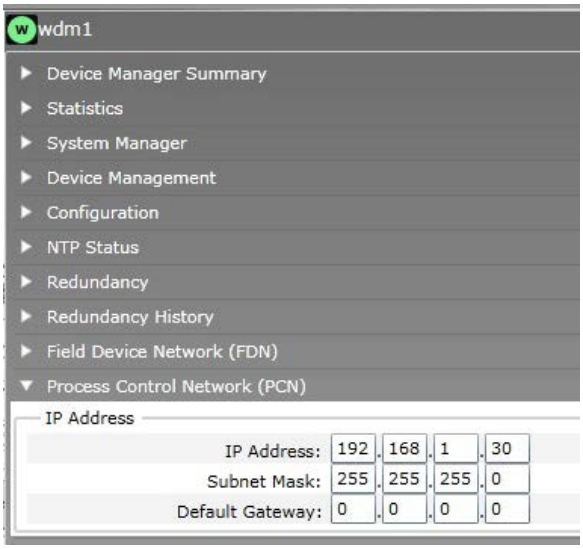


Figure 7 - 3.
WDM's **IP Address** Displayed in the Property Panel.

- In DataController, enter the **TCP Port**. The default is **4901**, but you can change it.

To find the WDM's TCP Port, go to the WDM user interface web page and expand the WDM item to select **GCI**.

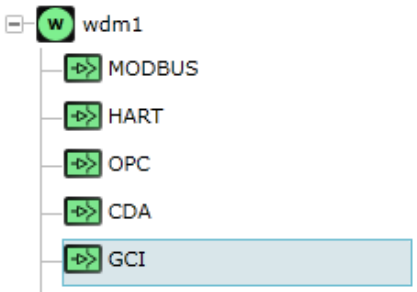


Figure 7 - 4.
WDM Expanded, **GCI** Communication Port.

When you open **Configuration** in the Property Panel, the **TCP Port** will be displayed.

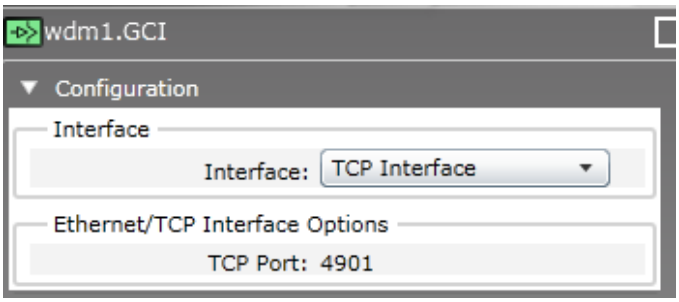


Figure 7 - 5.
WDM's TCP Port in the **Configuration** Panel.

- With the **WDM IpAddress** and **TCP Port** entered in DataController's **WDMList** tab, click **AddEntry** to create the new WDM entry in the file.

The row of navigation buttons on the **WDMList** tab enables you to move to the **FirstEntry**, **LastEntry**, **NextEntry** or **PreviousEntry** within the selected file. You can click **AddEntry** to add an entry to the file or **RemoveEntry** to remove one. The message "File Parse Success" means that the file was read successfully.

> ➢ You cannot modify an existing entry; you must create a new entry and delete the previous one.

Global Configuration (GlobalConfig)

The Global Configuration (GlobalConfig) file is used by DataController to load user configured settings to the SKF Multilog WVT if it comes in its factory default state. Global configuration enables you to define the preferred site configuration settings. DataController will load these settings automatically on factory default state devices.

If you want to re-initialize the SKF Multilog WVT with the current global configuration, first you will have to reset the SKF Multilog WVT to its factory default settings. Refer to **Chapter 2**, **Hardware Overview**, Restoring Factory Defaults, for details about how to restore factory default settings to a device. If the SKF Multilog WVT has previously joined the WDM's network, you would have to remove it from the WDM's device list as well. Refer to the *Wireless Device Manager (WDM) User Interface User Manual*, *Chapter 9, SKF Multilog WVT Maintenance*, *Removing an SKF Multilog WVT*.

GlobalConfig Tab Overview

The **GlobalConfig** tab provides many important fields and functions. This user manual presents them by each major section: **DataController Settings**, **Device Settings** and **Channel Settings**.

To begin editing the GlobalConfig tab:

- Click the **GlobalConfig** tab to open it.

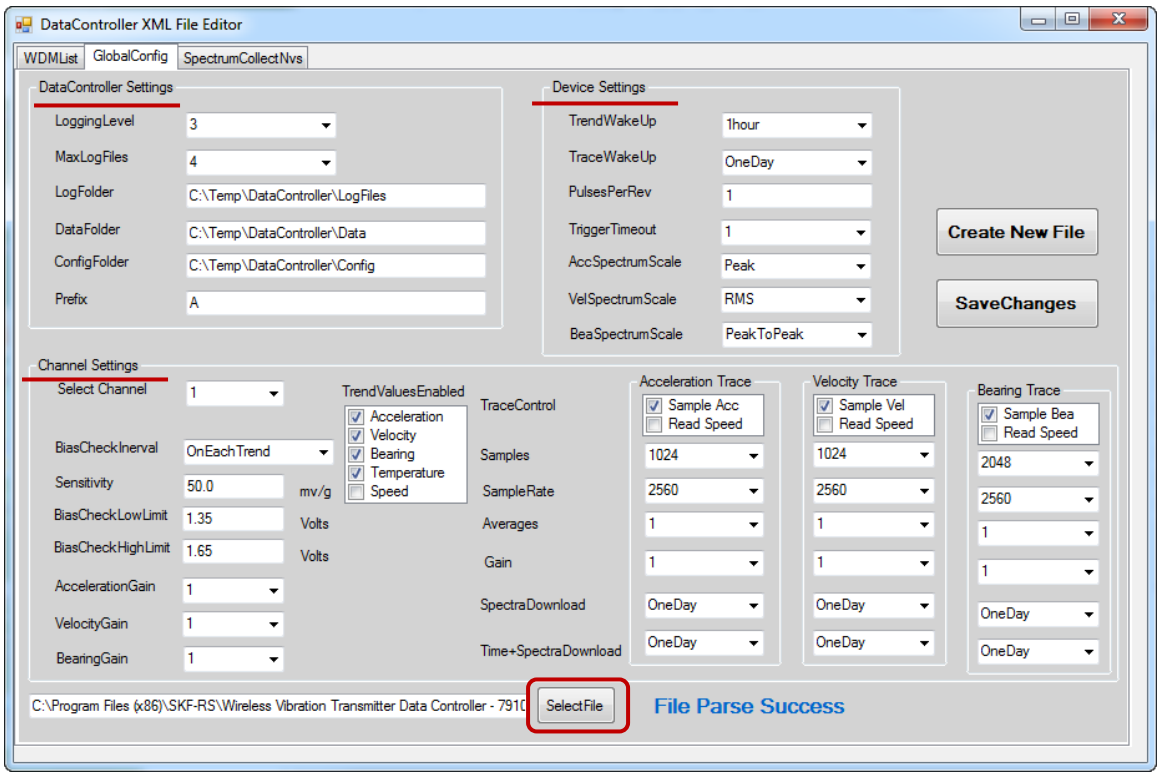


Figure 7 - 6.
GlobalConfig Tab.

- Click the **SelectFile** button at the bottom of the tab to locate and open the desired GlobalConfig.xml file to define the global default SKF Multilog WVT configuration. Edits made within the tab will update the selected xml file. Again, the message "File Parse Success" means that the file was read successfully.

  - If you want to create multiple global configuration files for different default settings, you may click **Create New File** to generate a new GlobalConfig.xml file. However, DataController uses only the GlobalConfig.xml file in the same folder as the DataController program.

  - The default path of the Global Config file is shown in the figure above (to the left of the **Select File** button). The default path is C:\Program Files (x86)\SKF-RS\Wireless Vibration Transmitter Data Controller - 7910\GlobalConfig.xml.

Remember to click the **SaveChanges** button on the right of the tab to save any entries and changes you made. You can do this when you have completed your entries on the entire tab or save your changes from time to time while you are working.

DataController Settings

In the upper left of the tab, the **DataController Settings** are grouped together.

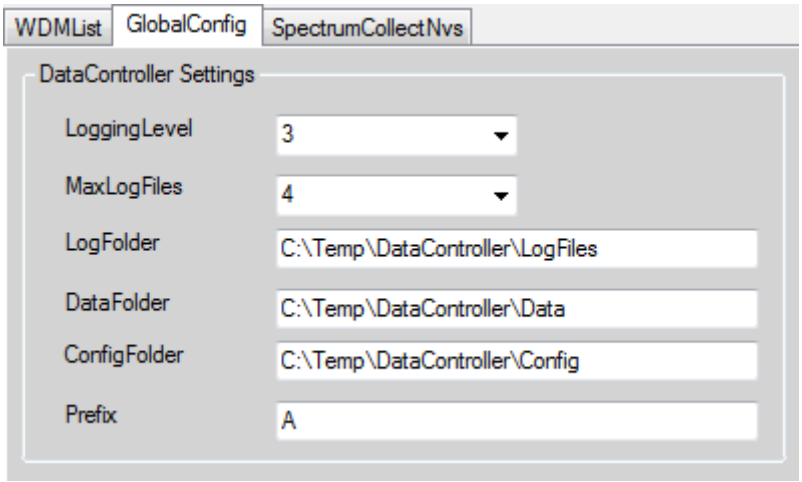


Figure 7 - 7.
DataController Settings.

To enter the DataController Settings:

- Select a **LoggingLevel** number to determine the log information for debugging and troubleshooting. The codes for different levels and their definitions are provided below. The default value is **3** for Error.
  - **1** = None
  - **2** = Exception
  - **3** = Error
  - **4** = Info
  - **5** = Debug
- Select the **MaxLogFiles** number (**1** to **10**) to specify the maximum number of back up log files to be stored, depending on the memory availability. The storage space allowed is not more than 16 MB for each file.

  Example 1: For **MaxLogFiles** = **2**, when the DataControllerLog.txt file exceeds 16 MB limit, it will be renamed to DataControllerLog.txt.1 file and a new empty DataControllerLog.txt file will be created. If the DataControllerLog.txt.1 file already exists, it will be renamed to DataControllerLog.txt.2 file. DataControllerLog.txt.2 is the oldest file and DataControllerLog.txt is the newest file.

  Example 2: For **MaxLogFiles** = **4**, when the DataControllerLog.txt file exceeds 16 MB limit, it will be renamed to DataControllerLog.txt.1 file and a new DataControllerLog.txt file will be created. Each succeeding time the DataControllerLog.txt file exceeds allowed storage space, the file names will

increment by one and a new DataControllerLog.txt file will be created. When an existing DataControllerLog.txt.4 file is replaced by an incrementing DataControllerLog.txt.3 file, the original DataControllerLog.txt.4 file will be purged.

- In **LogFolder**, define the directory path in a local machine or network location where the DataController Log files are placed. The log file contains the information as specified in the **Logging Level** setting.
- In **DataFolder**, define the directory path where the Data XML files (POINTs/Data/ Events) are created by DataController and are consumed by SKF @ptitude Analyst. This must match exactly the **Input** directory in the SKF @ptitude Analyst **XML Import Configuration** dialog, as stated in **Chapter 9, Configuring the XML Import**. (The example below shows the default DataFolder.)

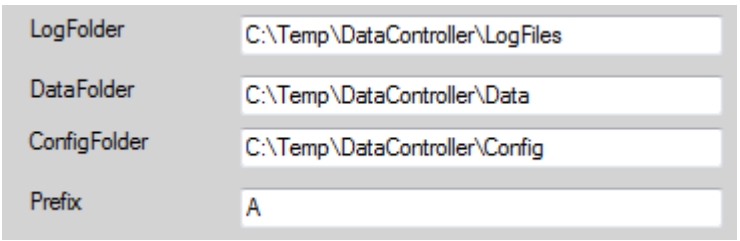


Figure 7 - 8.
DataFolder and **Prefix** Defaults.

- The **ConfigFolder** stores the path to the SpectrumCollectNvs.xml file.
- Specify the file **Prefix** for Data XML files created by the DataController. The default is **A**. For installations that use multiple DataController instances, each instance must have a unique xml file prefix. For example, this entry is appended to the regular prefix of "WVT_ISA100_" to become "WVT_ISA100_A_". The prefix of the next DataController instance may be changed to "B" so that the prefix will become "WVT_ISA100_B_" to avoid file name conflicts from different instances of DataController in the system.

Device Settings Fields

In the upper right of the **GlobalConfig** tab, the **Device Settings** are grouped together with **TrendWakeUp** as the first field.

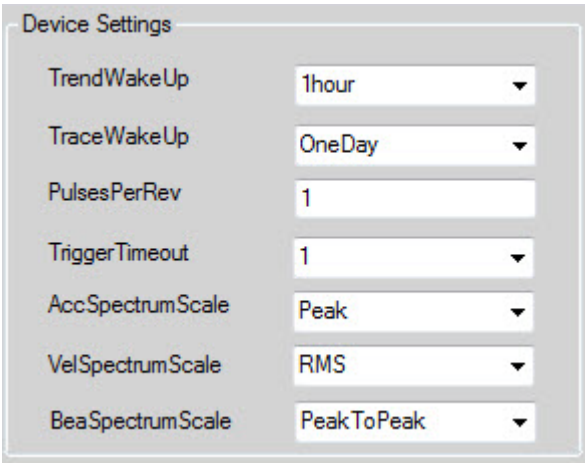


Figure 7 - 9.
Device Settings Fields.

Two routes are defined for the device: one for the trend overall measurements (Trend Route) and one for the trace measurements (Trace Route). The intervals at which these two routes are performed are defined independently.

As part of the Trend Route, each channel measures up to five selectable trend values: acceleration, velocity, bearing, temperature, and speed. Once configured, the SKF Multilog WVT automatically samples the enabled values periodically, as defined by the **TrendWakeUp** interval, and publishes the values to the WDM.

As part of the Trace Route, you may select to measure acceleration FFT and/or time, velocity FFT, and bearing FFT and/or time. The values are then sampled by the device periodically, as defined by the **TraceWakeUp** interval. The samples remain in memory to be uploaded to SKF @ptitude Analyst by DataController, using multiple packets per trace, according to the DataController trace collection schedule which is displayed initially in the **SpectraDownload** and **Time+SpectraDownload** fields in the GlobalConfig tab. These can be modified for an individual SKF Multilog WVT unit in the **SpectrumCollectNvs** file.

To enter the Device Settings:

- **TrendWakeUp** determines how frequently the configured SKF Multilog WVT automatically samples the enabled trend values. As part of the Trend Route, each channel can measure up to five selectable trend values: acceleration, velocity, bearing, temperature, and speed.

  Select the **TrendWakeUp** interval in number of minutes, hours, or days, up to one month in between the times when the SKF Multilog WVT will take the specified trend measurements. The default is 1 hour.

➢ All of the intervals that are less than one day are divided exactly over a 24 hour period; therefore, if the sample is taken at 2 p.m. on one day, it remains at 2 p.m. on all days.

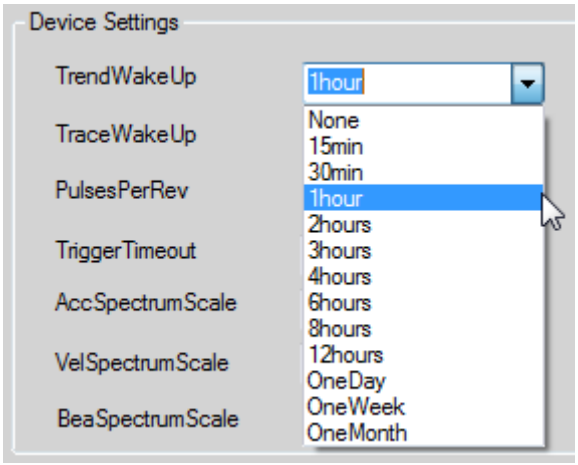


Figure 7 - 10.
Device Settings, **TrendWakeUp** Options.

- **TraceWakeUp** determines how frequently the configured SKF Multilog WVT automatically samples the selected trace values. As part of the Trace Route, you may select to measure acceleration FFT and/or time, velocity FFT, and bearing FFT and/or time.

  Select the **TraceWakeUp** interval in number of minutes, hours, or days, up to one month, in between the times when the SKF Multilog WVT will take the specified time wave and spectra measurements. The options for the **TraceWakeUp** interval are the same as **TrendWakeUp** interval. The default is one day.

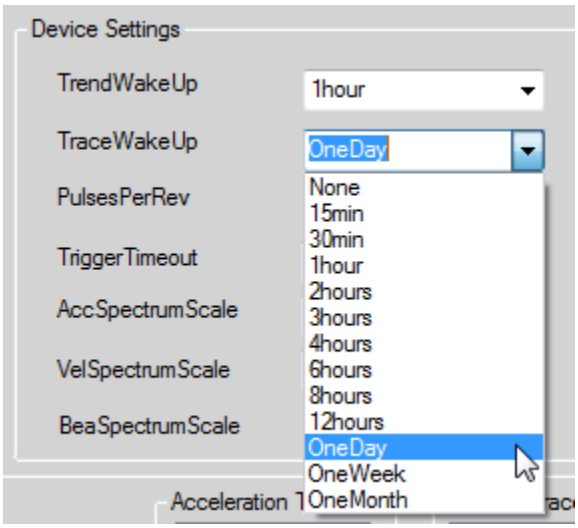


Figure 7 - 11.
Device Settings, **TraceWakeUp** Options.

- Enter the **PulsesPerRev.** This is the number of pulses the tachometer provides for each cycle.

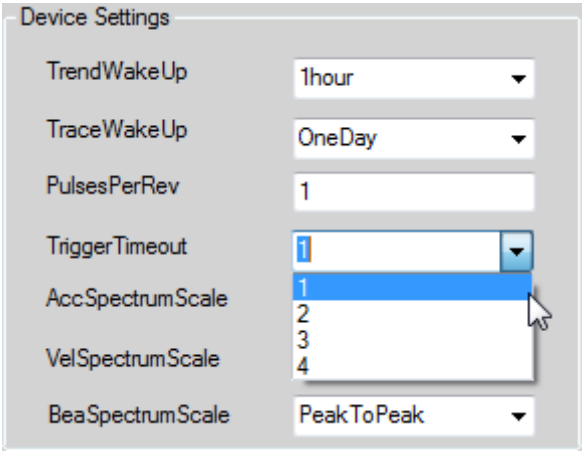


Figure 7 - 12.
Device Settings, **Trigger Timeout** Options.

- Select the **TriggerTimeout** as **1**, **2**, **3**, or **4**. The option of 1 second conserves battery power by reducing the wait time.

  - Be sure to adjust the trigger timeout according to the machine's speed. For example, the trigger timeout should be 2 seconds for a machine rotating at 2 Hz in order to avoid missing the trigger. In this example, at 0.5 second for each trigger, it takes 1 second to capture 2 triggers. Select 2 seconds to avoid missing the second trigger. The maximum setting is 4 seconds. Therefore, the machine speed must be at least 0.5 Hz or equal to 30 CPM to capture the speed within the 4 second trigger timeout.

The next three spectrum scale fields enable you to set the scale expressed of the measured quantity. **AccSpectrumScale**, **VelSpectrumScale** and **BeaSpectrumScale** all offer the same options.

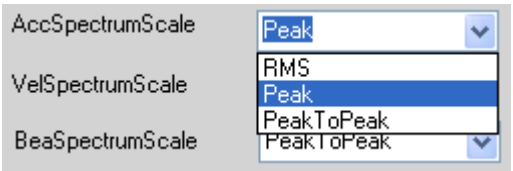


Figure 7 - 13.
Device Settings, Spectrum Scale Options.

- Select the **AccSpectrumScale**. **Peak** is the default setting for the acceleration spectrum.

  - Peak is calculated from RMS.

- Select the **VelSpectrumScale**. **RMS** (root-mean-squared) is the default setting for the velocity spectrum.

- Select the **BeaSpectrumScale**. **Peak To Peak** is the default setting for the bearing spectrum. (SKF uses Peak to Peak for the bearing spectrum scale.)

Channel Settings – Trace Field Settings

The lower half of the **GlobalConfig** tab displays the **Channel Settings**.

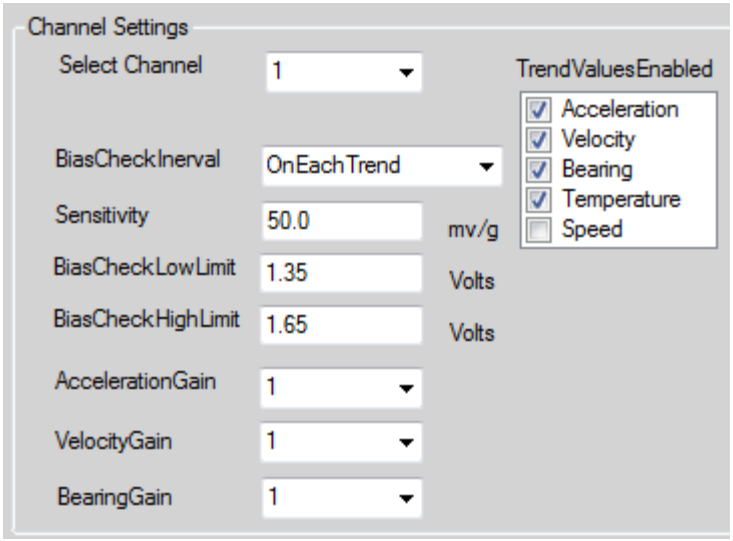


Figure 7 - 14.
Channel Settings Fields (Left Side of the **GlobalConfig** Tab).

To enter the Channel Settings (left side of the GlobalConfig tab):

- In **Select Channel**, specify which channel number, 1 through 4, you are configuring.
- Select the **Trend Values Enabled** checkboxes to enable the periodic collection of the required trend values by the selected channel. The available trend values are **Acceleration**, **Velocity**, **Bearing**, **Temperature** and **Speed**.
    - The **Speed** trend value is shared by all channels. Therefore, if more than one channel has this enabled, only one speed reading will be taken and the result will be used for all the channels.
- **BiasCheckInterval** determines how frequently the bias voltage is sampled. Select the interval between the times when the selected channel will take the bias voltage sample: **OnEachTrend** (the default), **OnceADay** or **Never**.
- Enter **Sensitivity mv/g**. This is the accelerometer sensitivity in millivolts. The default is 50 mv/g for the dedicated CMSS 2350T-D2 sensor.
- Enter **BiasCheckLowLimit** Volts. This is the lower threshold for the bias voltage alert.
- Enter **BiasCheckHighLimit** Volts. This is the upper threshold for the bias voltage alert.
- Select the **Acceleration Gain** 1 or 10. (The default is 1.)
- Select the **Velocity Gain** 1 or 10. (The default is 1.)

- Select the **Bearing Gain** 1 or 10. (The default is 1.)

Trace Settings

Valid Sample Rates, Number of Lines and the maximum number of Averages are given in the table below.

Number of Averages Allowed

Fmax (Hz)	Sample Rate (Hz)	100 Lines 256 Samples	200 Lines 512 Samples	400 Lines 1024 Samples	800 Lines 2048 Samples	1600 Lines 4096 Samples	3200 Lines 8192 Samples
20 000	51 200	4 Averages	4 Averages	4 Averages	4 Averages	4 Averages	4 Averages
10 000	25 600	4 Averages	4 Averages	4 Averages	4 Averages	4 Averages	4 Averages
5 000	12 800	4 Averages	4 Averages	4 Averages	4 Averages	4 Averages	4 Averages
2 000	5 120	4 Averages	4 Averages	4 Averages	4 Averages	4 Averages	2 Averages
1 000	2 560	4 Averages	4 Averages	4 Averages	4 Averages	2 Averages	1 Average
500	1 280	4 Averages	4 Averages	4 Averages	2 Averages	1 Average	N/A
200	512	4 Averages	4 Averages	2 Averages	1 Average	N/A	N/A
100	256	4 Averages	2 Averages	1 Average	N/A	N/A	N/A

⚠ ***WARNING: The maximum Sample Rate is 25 600 or 10 kHz because the sensor develops resonance at approximately 15 kHz.***

Time Required for Trace Data to be Available in SKF @ptitude Analyst

The collection of trace waveform data from the SKF Multilog WVT by DataController takes varying amounts of time, depending on the configured number of trace samples. It can take a few minutes or a few hours for DataController to collect all the time wave and spectra measurements for all four channels. The collection of waveform data is faster for a device using line power versus a battery powered device.

The following table shows the amount of time that it takes the trace data with the configured number of samples from all four channels of the device to be uploaded to SKF @ptitude Analyst for line powered versus battery powered SKF Multilog WVT devices. It also shows the default trace interval in DataController for line powered versus battery powered SKF Multilog WVT devices in the event that the trace interval value was less than the required data upload time.

- The DataController initially collects the traces according to the settings in the **SpectraDownload** and **Time+SpectraDownload** fields in the **GlobalConfig** tab. This can be modified for individual SKF Multilog WVT units in the **SpectrumCollectNvs** tab.

Trace Data Collection Interval Guidelines

	Line Powered SKF Multilog WVT		Battery Powered SKF Multilog WVT	
No. of Samples	**Data uploaded on @ptitude Analyst**	**Default Trace Interval**	**Data uploaded on @ptitude Analyst**	**Default Trace Interval**
256	15 minutes	15 minutes	20 minutes	30 minutes
512	20 minutes	30 minutes	40 minutes	1 hour
1024	30 minutes	1 hour	1 hour	2 hours
2048	45 minutes	2 hours	1.5 hours	4 hours
4096	1 hour	4 hours	2 hours	8 hours
8192	2 hour	8 hours	3 hours	1 day

For example, 2048 samples can be uploaded to SKF @ptitude Analyst in 45 minutes from an SKF Multilog WVT on line power. Whatever the data collection schedule setup, the data viewable in SKF @ptitude Analyst was collected a minimum of 45 minutes ago. If the trace interval is set as less than the 45 minutes needed to complete the data upload, DataController will override the invalid value with the default trace interval value of two hours as shown in the table.

When troubleshooting, you may want to temporarily shorten the interval to collect data more frequently. For example, with the **Trace Interval** set to every 15 minutes, you must reduce the number of samples to 256. This will allow the SKF Multilog WVT to complete sending the traces for all four channels to SKF @ptitude Analyst within 15 minutes.

⚠WARNING! If the time interval is reduced for testing, battery power will be consumed more quickly. Be sure to return the device to its regular settings when you are finished.

⚠WARNING! DataController overrides the invalid value silently. The user-selected trace interval will still appear in the application as entered. The trace interval actually being used by the system can be found in the SpectrumCollectNvs file, discussed in the Wireless Device Manager (WDM) User Interface User Manual, Chapter 9, SKF Multilog WVT Maintenance.

Channel Settings – Trace Fields Matrix

The right side of the **Channel Settings** contains fields that define the parameters of the **Acceleration Trace**, **Velocity Trace** and **Bearing Trace** measurements. The fields are arranged as a matrix, as shown below.

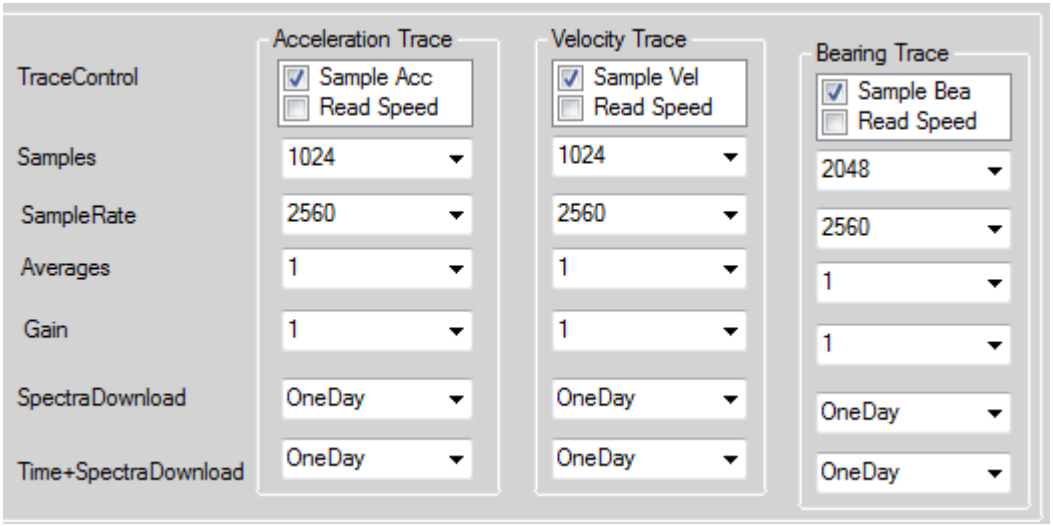


Figure 7 - 15.
GlobalConfig Tab, Matrix of Trace Fields.

To enter the Channel Settings (right side of the GlobalConfig tab):

- For **TraceControl**, select the appropriate checkbox to enable the measurement sampling you want: **Sample Acc**, **Sample Vel** and/or **Sample Bea**.
    - ➢ If the **Read Speed** checkbox is selected, the SKF Multilog WVT will stamp the measurement with speed. If the tacho is not connected or the machine is not running, then the SKF Multilog WVT will wait until the trigger timeout expires and then make a measurement with the speed stamp of 0 RPM.
- Select the number of **Samples** you want the SKF Multilog WVT to take. The number of samples is equal to the number of FFT lines x 2.56.

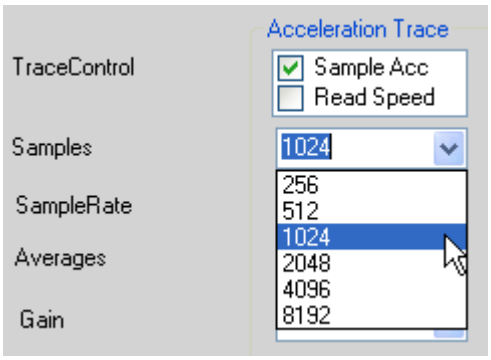


Figure 7 - 16.
Samples Options.

- Select the **SampleRate**.

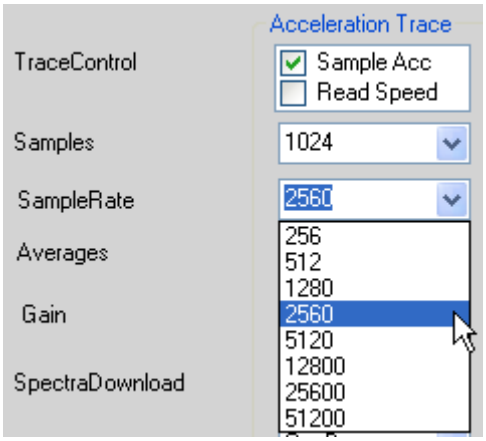


Figure 7 - 17.
SampleRate Options.

WARNING: The maximum Sample Rate is 25 600 or 10 kHz because the sensor develops resonance at approximately 15 kHz.

- Select the number of **Averages: 1**, **2**, **3** or **4**. The table above can help you determine the maximum number of averages to select according to the number of samples and sample rate.
- Select the **Gain** (**1** or **10**).

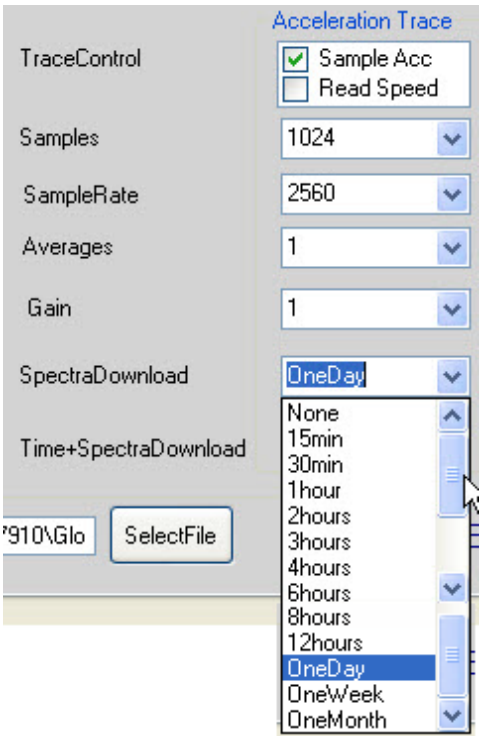


Figure 7 - 18.
SpectraDownload Options.

- Select the **SpectraDownload** frequency for DataController to collect the FFT. This interval must be greater than the data upload time to SKF @ptitude Analyst, according to the *Trace Data Collection Interval Guidelines* table presented in the previous section, *Time Required for Trace Data to Be Available in SKF @ptitude Analyst*.

  - As mentioned previously, all of the intervals that are less than one day are divided exactly over a 24 hour period.

- Select the **Time+SpectraDownload** frequency (the options are identical to those for SpectraDownload). This is the time waveform download frequency used by DataController for time + FFT. This interval must be greater than the data upload time to SKF @ptitude Analyst, according to the *Trace Data Collection Interval Guidelines* table presented in the previous section, *Time Required for Trace Data to Be Available in SKF @ptitude Analyst*.

> ⚠ ***IMPORTANT: Because the size of a time waveform is much larger than a spectrum, Time+SpectraDownload should be scheduled less often than the spectra frequency to conserve battery life. For example, data collection could be scheduled as: collect trend every hour, spectra once a day and time waveform once a week.***

The same field descriptions and entries detailed above apply also to the adjacent **Velocity Trace** and the **Bearing Trace** sections of the **Channel Settings**.

> ⚠ ***IMPORTANT: After the device is initialized, any further modifications to specific device or channel settings must be accomplished through the WDM user interface. The trace collection time for an individual unit may be modified in the SpectrumNvs tab in DataController's XML Editor.***

The **SpectraDownload** and the **Time+SpectraDownload** provide the default global collection schedule. See the *Wireless Device Manager (WDM) User Interface User Manual* for details about changing the trace collection schedule for an individual device already in service.

Chapter Summary

To summarize the configuration process, we have:

- Launched XML File Editor and entered on the **WDMList** tab the IP address and TCP Port number of each WDM in order to communicate with them over the Ethernet.
- Edited the **GlobalConfig** tab with the user-defined global configuration settings that DataController will load automatically to the SKF Multilog WVT if it comes in factory default state.
- Discussed how sample size affects the trace upload time.

In the next chapter, we will establish communication between DataController and the WDM.

8
DataController and the WDM

Configuring the GCI Server

The Gateway Client Interface (GCI) is a protocol that is used with client applications that communicate with the wireless field devices using the ISA100.11a standard. DataController implements a GCI Client interface and the WDM provides a GCI Server interface to communicate with SKF Multilog WVT devices connected over the ISA100 network.

After accessing the WDM's web page, you must configure the GCI Server so that DataController can communicate with the WDM.

> ➢ Recall that each instance of DataController can communicate with a maximum of eight WDMs.

To configure the GCI Server:

- Open the browser and in the address bar enter the appropriate WDM PCN IP Address. The Process Control Network (PCN) side of the network default is https://192.168.1.1.

  > ➢ If you have connected to the Field Device Network (FDN) side of the network, enter the default IP address: https://192.168.0.1.

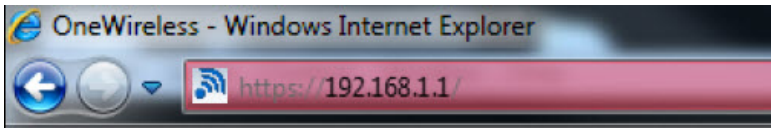


Figure 8 - 1.
Ethernet PCN IP Address.

- In the **User Login** dialog, enter **administrator** as the default **User ID** and **password** as the default **Password**. The WDM user interface displays.

Figure 8 - 2.
User Login Dialog.

- From the Selection Panel on the left, expand the **WDM** icon and select **GCI**.

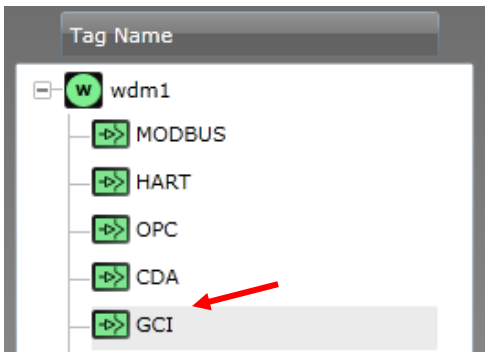


Figure 8 - 3.
Expanded **WDM** Icon - Select **GCI**.

- On the Property Panel, expand **Configuration**.

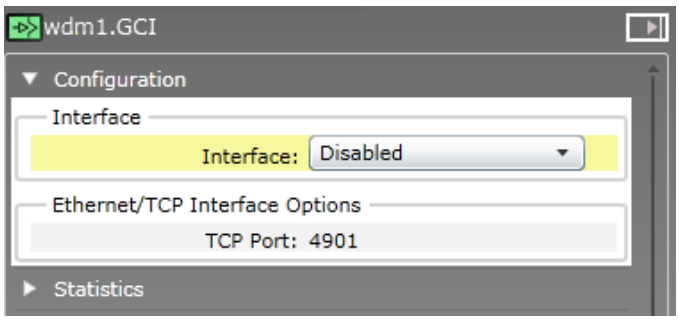


Figure 8 - 4.
Property Panel – **Configuration**.

- In the **Interface** group, select **TCP Interface**.

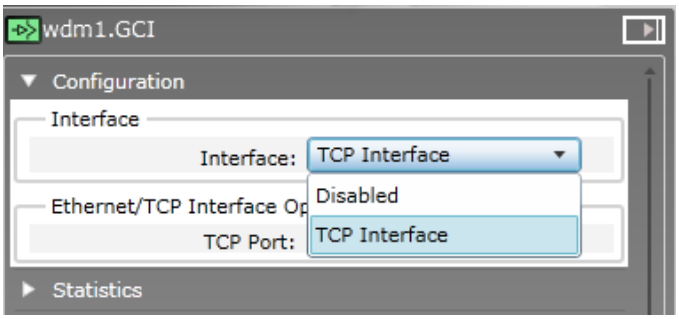


Figure 8 - 5.
Configuration – **TCP Interface** option.

- Under **Ethernet/TCP Interface Options**, in the **TCP Port** field, enter the TCP Port number. The default of 4901 is shown in the figure below.

⚠IMPORTANT: The TCP Port entry for the WDM must match exactly the TCP Port entered in DataController's WDMList tab.

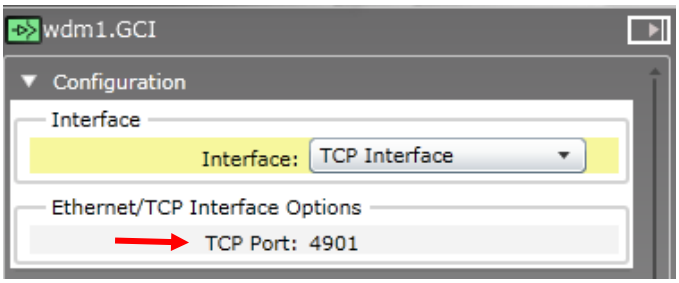


Figure 8 - 6.
Configuration – TCP Port.

- Click the **Apply** button below the Property Panel to apply the changes.
  - ➢ The **Apply** and **Reset** buttons become active when you make changes in the Property Panel. Click **Reset** if you do not want to apply your changes.

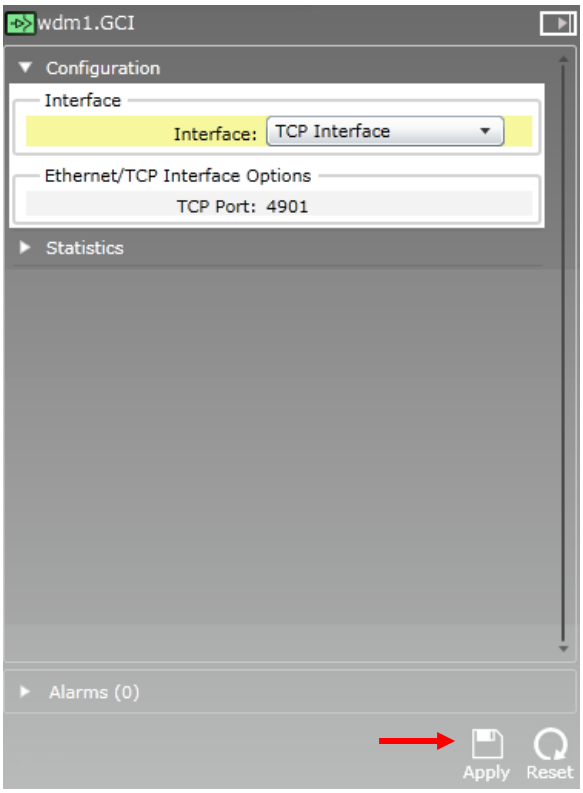


Figure 8 - 7.
Apply the Settings.

DataController is now able to communicate with the WDM through the specified TCP Port.

Verifying DataController's Connection to the WDM

To verify that DataController is connected to the WDM:

You can check the DataController log to verify the GCI connection status. Follow the steps below:

- Start the DataController service, or restart it if it is running. (Refer to **To launch ServiceManager** in **Chapter 6** for details.)
- Go to the DataController LogFiles folder. The default path is C:\Temp\DataController\LogFiles.
  - ➢ If you do not find the LogFiles folder at the default path, you can look up the location. Launch XML File Editor and go to the **GlobalConfig** tab. The path is entered in the field **LogFolder**.

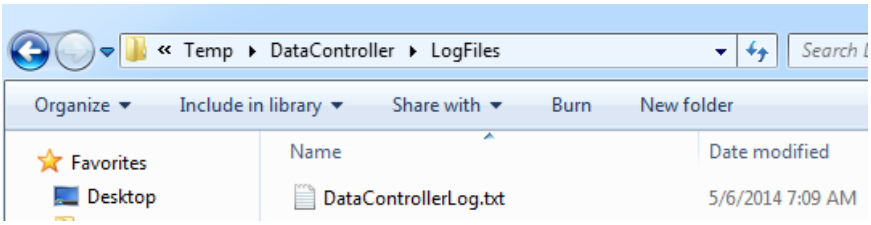


Figure 8 - 8.
DataController LogFiles Folder.

- Double-click the LogFiles folder to open it.
- Double-click the DataControllerLog.txt file to open it.
- Search for the statement **Connected to GCI Server** with the date/time stamp at which the server was restarted. An example is provided below.

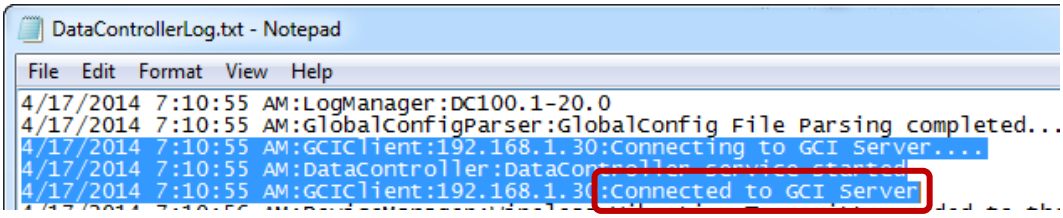


Figure 8 - 9.
DataControllerLog.txt File, Connected to GCI Server.

If the connection fails, the text "Connecting to GCI Server" will keep repeating. Step through the GCI configuration procedure in this chapter and check that the WDM **IP address** is correct, that **TCP Interface** is selected as the Interface, and the **TCP Port** is correct.

Verifying the Local Time Zone

The SKF Multilog WVT uses Coordinated Universal Time (UTC) internally. DataController will configure the SKF Multilog WVT device with the local time zone when the device in its factory default state is initialized. With this step complete, DataController will export measurements with the correct date/time stamp.

When DataController is connected to the WDM, we recommend that you verify the local time zone setting of the SKF Multilog WVT through the WDM user interface web page, as described below.

> ➢ DataController will automatically adjust the system local time zone for Daylight Saving Time (DST).

To verify or configure the local time zone:

- Go to the WDM user interface web page.
- Select the **SKF Multilog WVT**.
- Open the Property Panel.
- Expand the **Device Vendor Parameters**, **Other Attributes** panel.

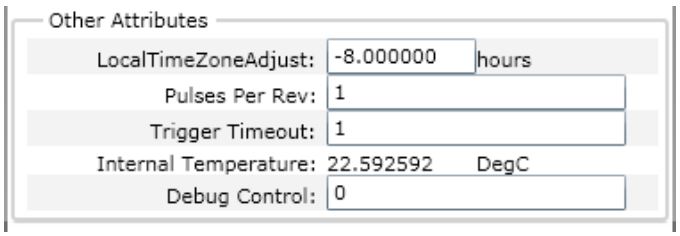


Figure 8 - 10.
LocalTimeZoneAdjust Field.

- Verify the local time zone. If needed, adjust the local time zone by entering the number of hours (plus or minus) from Coordinated Universal Time (UTC) in the field **LocalTimeZoneAdjust**.

> ➢ The example shows -8 hours for Pacific Standard Time. This will update automatically to -7 hours for Pacific Daylight Time if the computer running DataController is set up to automatically adjust for Daylight Savings Time.

- If you make a change, click **Apply**.

Configuring the Measurement Units

It is important to configure each channel as soon as possible with the units of measure you want to use so that data is gathered in the appropriate units.

> ⚠ ***WARNING! When you make a change to the Units Index for a channel, DataController deletes the corresponding POINTs for that channel in SKF @ptitude Analyst. New POINTs will be created with the new units.***

With the channel(s) inactivated, you can modify the measurement settings. Use the channel properties groups in the Property Panel to modify the measurement settings, as necessary.

To configure the Units Index, Velocity Overall:

- Go to the WDM user interface web page.
- In the Selection Panel, select the **SKF Multilog WVT**.
- Click **Inactivate** in the Channel group in the ribbon bar to inactivate all channels at one time.
- In the Selection Panel, select the individual channel you want to modify.
- In the Property Panel, expand **Velocity Overall**.

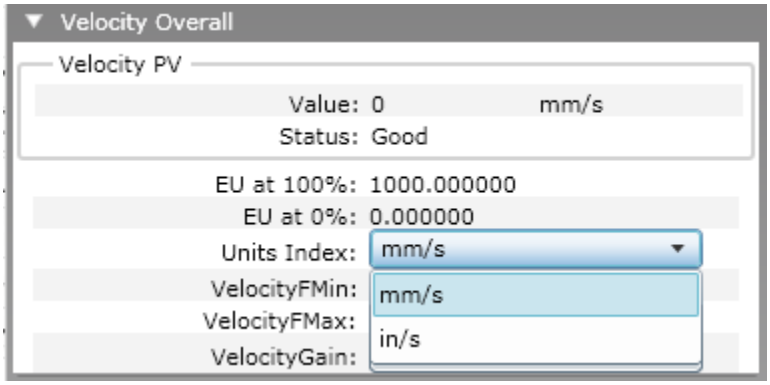


Figure 8 - 11.
Velocity Overall, Units Index.

- You can change the **Units Index** for the measurement to **mm/s** or **in/s**. The default is **mm/s**.
- Click **Apply**.

> ⚠ ***WARNING! Be sure to reactivate the channels only after you have finished modifying all channel settings.***

To configure the Units Index, Temperature Overall:

- Go to the WDM user interface web page.
- In the Selection Panel, select the **SKF Multilog WVT**.
- Click **Inactivate** in the Channel group in the ribbon bar to inactivate all channels at one time.
- In the Selection Panel, select the individual channel you want to modify.
- In the Property Panel, expand **Temperature Overall**.

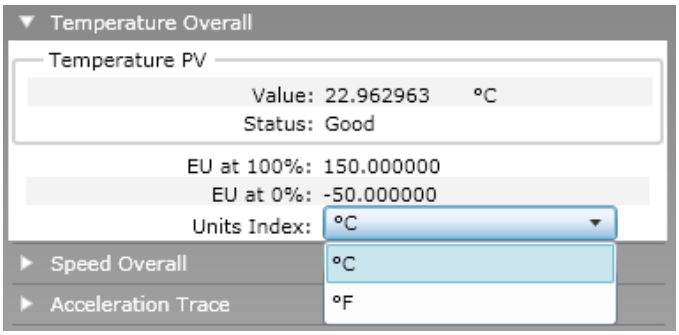


Figure 8 - 12.
Temperature Overall, Units Index.

- You can change the **Units Index** for the measurement to degrees Celsius (**°C**) or Fahrenheit (**°F**). The default is degrees Celsius (**°C**).
- Click **Apply**.

⚠WARNING! Be sure to reactivate the channels only after you have finished modifying all channel settings.

To configure the Units Index, Speed Overall:

- Go to the WDM user interface web page.
- In the Selection Panel, select the **SKF Multilog WVT**.
- Click **Inactivate** in the Channel group in the ribbon bar to inactivate all channels at one time.
- In the Selection Panel, select the individual channel you want to modify.
- In the Property Panel, expand **Speed Overall**.

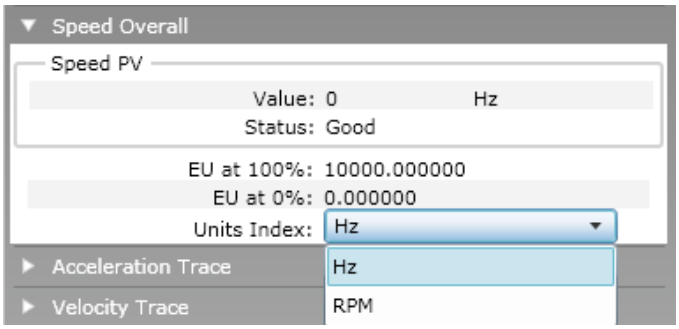


Figure 8 - 13.
Speed Overall, Units Index.

- You can change the **Units Index** for the measurement to **Hz** (Hertz) or **RPM** (revolutions per minute). The default is **Hz**.
- Click **Apply**.

⚠WARNING! Be sure to reactivate the channels only after you have finished modifying all channel settings.

Chapter Summary

To summarize the activities in this chapter, we have configured the WDM's GCI Server to interface with the same TCP Port that was entered in DataController's **WDMList** tab and verified DataController's connection to the GCI Server. We have verified the local time zone and configured the SKF Multilog WVT with the desired measurement units.

In the next chapter, we will configure SKF @ptitude Analyst to import the DataController output XML files.

9
Configuring the XML Import

Configuring the XML Import in SKF @ptitude Analyst

SKF @ptitude Analyst must be configured to import the DataController output XML files. Essentially, the Input directory must match DataController's DataFolder and the File Prefix must be identical in both applications. The general purpose of the XML Import feature is to import data from a third party system.

To configure the SKF @ptitude Analyst / XML Import interface for use with DataController:

- In SKF @ptitude Analyst, select the **Customize** menu's **Configure XML Import** option.

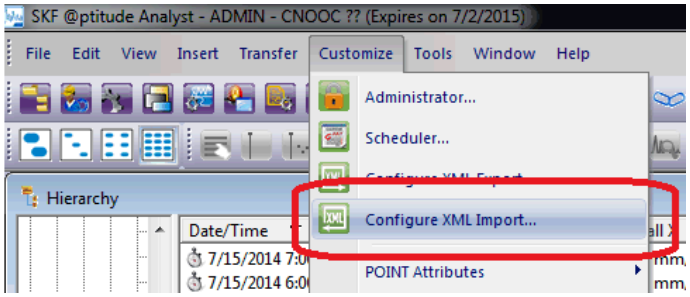


Figure 9 - 1.
The **Configure XML Import** Option.

- The **XML Import Configuration** dialog displays. Select the **Enable processing** checkbox to enable the automatic import function.

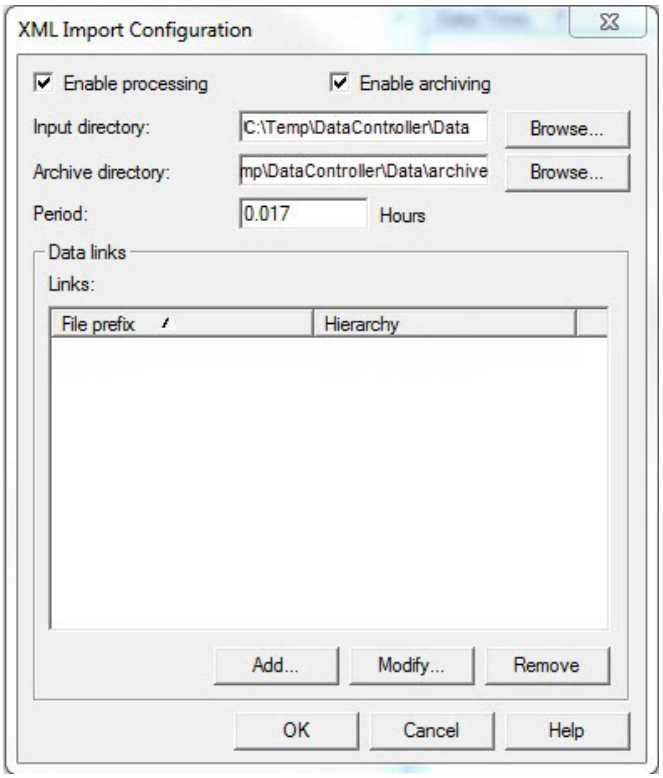


Figure 9 - 2.
The **XML Import Configuration** Dialog.

- Select the **Enable archiving** checkbox to enable data archiving during setup, testing, or troubleshooting activities. During normal operation, you would want archiving to be disabled to avoid filling up the hard drive with archived XML files.
- Click **Browse...** to locate and select the **Input directory** for SKF Multilog WVT data files from DataController.

  - **IMPORTANT:** The **Input directory** in the SKF @ptitude Analyst XML Import Configuration *must* be the same as the **DataFolder** in the **GlobalConfig** tab. In this example, we have matched the default directory shown in the screen capture of the DataController Settings in **Chapter 7, DataController and XML File Editor**, of this user manual. You may create and use your own directory name and path.

- Click **Browse...** to locate and select the **Archive directory** for SKF Multilog WVT data files from DataController.
- In the **Period** text box, enter **0.017** Hours to attain new data quickly. This is the shortest period (one minute) to have the application check for new XML import files.
- In the **Data links** area, click **Add** to launch the **Data Links** dialog.

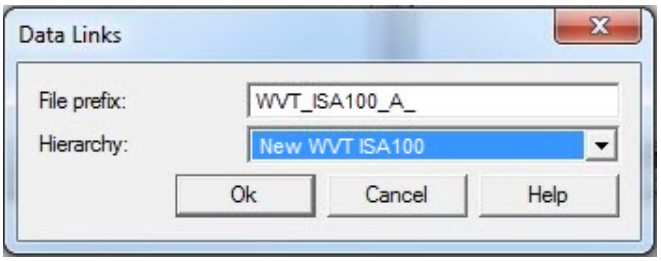


Figure 9 - 3.
The **Data Links** Dialog.

- In the **File Prefix** text entry box, enter **WVT_ISA100_A_** as the prefix.

The file prefix for the SKF Multilog WVT device in the SKF @ptitude Analyst Import Configuration is WVT_ISA100_X_, where X is the same **Prefix** in the **GlobalConfig** tab. The default for X is **A**, as shown in the screen capture of the **DataController Settings** in **Chapter 7, DataController and XML File Editor**, of this user manual. The prefix is designed this way so that if the system has more than one instance of DataController, the file name prefix for each instance can be unique. For example, WVT_ISA100_A_20131205170641.xml, WVT_ISA100_B_20131205170641.xml, and so on.

- From the **Hierarchy** drop-down list, select the hierarchy in which you want to store the SKF Multilog WVT data.
- Click **OK** to return to the **XML Import Configuration** dialog.

The File prefix and Hierarchy now display in the Links window.

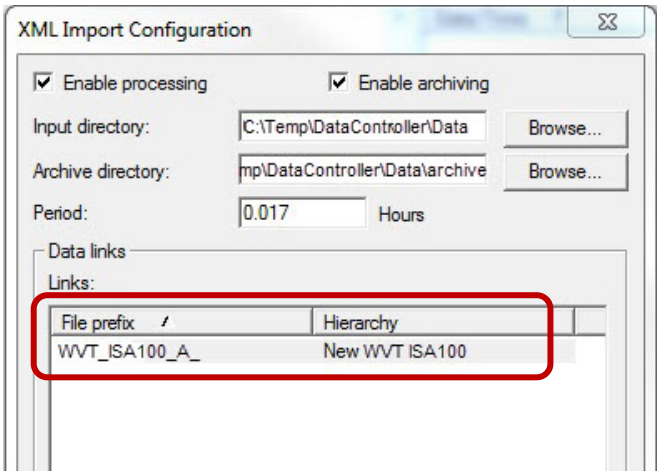


Figure 9 - 4.
The **XML Import Configuration** Dialog - **Links Window**.

SKF Multilog WVT in the SKF @ptitude Analyst Hierarchy

After the SKF Multilog WVT has joined the network and the XML import has been configured, and the DataController service is running in the background, then DataController should create the following items for each SKF Multilog WVT in the SKF @ptitude Analyst hierarchy.

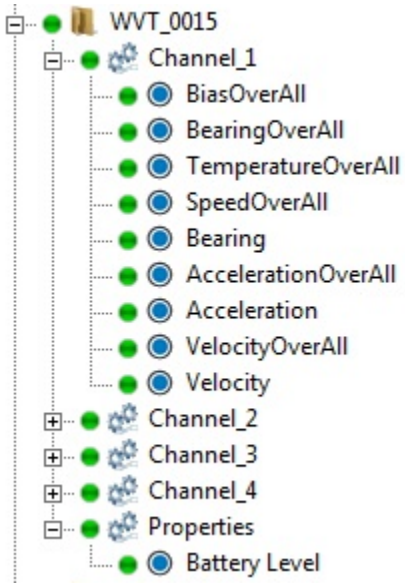


Figure 9 - 5.
SKF Multilog WVT Items Displayed in the SKF @ptitude Analyst Hierarchy.

If the hierarchy is *not* imported into Analyst, follow the recommended actions below:

- Check to see if there is an XML file in the input directory.
- If no file is found in the input directory, verify that the DataController service is running by checking in DataController Service Manager or Windows Service Window.
- Verify that the path is correct in the DataController XML Editor > **GlobalConfig** tab > **DataFolder**.
    - ➢ If you make any changes in the XML Editor, you must stop and start the DataController service.
- If XML files are accumulating in the Analyst input directory but are not consumed by Analyst, verify that the path in Analyst matches the DataController XML Editor > **GlobalConfig** tab > **DataFolder**.
- Confirm that the last character of the **File Prefix** in the Analyst XML Import Configuration matches the **GlobalConfig** tab entry for **Prefix**.
- Verify that **Enable processing** is checked in the **XML Import Configuration** dialog.
- Verify that Analyst's transaction service is running.

SKF @ptitude Analyst Transaction Service

The Analyst transaction service must be running for the XML import functions to work. It monitors the **Input directory** for new XML files from DataController at the regular interval as specified in the **XML Import Configuration** dialog, as described in the previous section.

You can verify that the transaction service is running by checking the SKF @ptitude Analyst Configuration Tool. Follow the steps below.

- From the Windows **Start** menu, go to **SKF @ptitude Monitoring Suite** > **Admin Tools** > **SKF @ptitude Analyst Configuration Tool**.

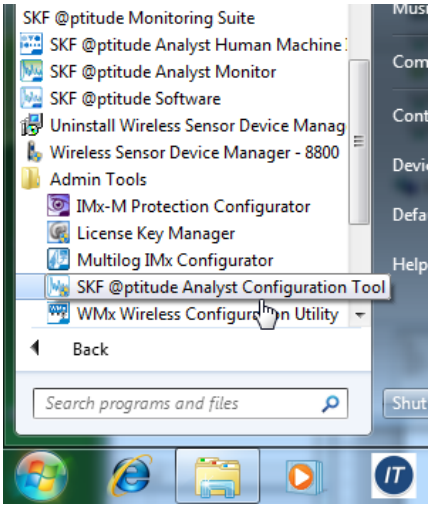


Figure 9 - 6.
Start Menu to SKF @ptitude Analyst Configuration Tool.

- Click the **Configuration Tool** icon , and then click **OK** to pass any warnings that may display. The SKF @ptitude Analyst Configuration Tool will open.

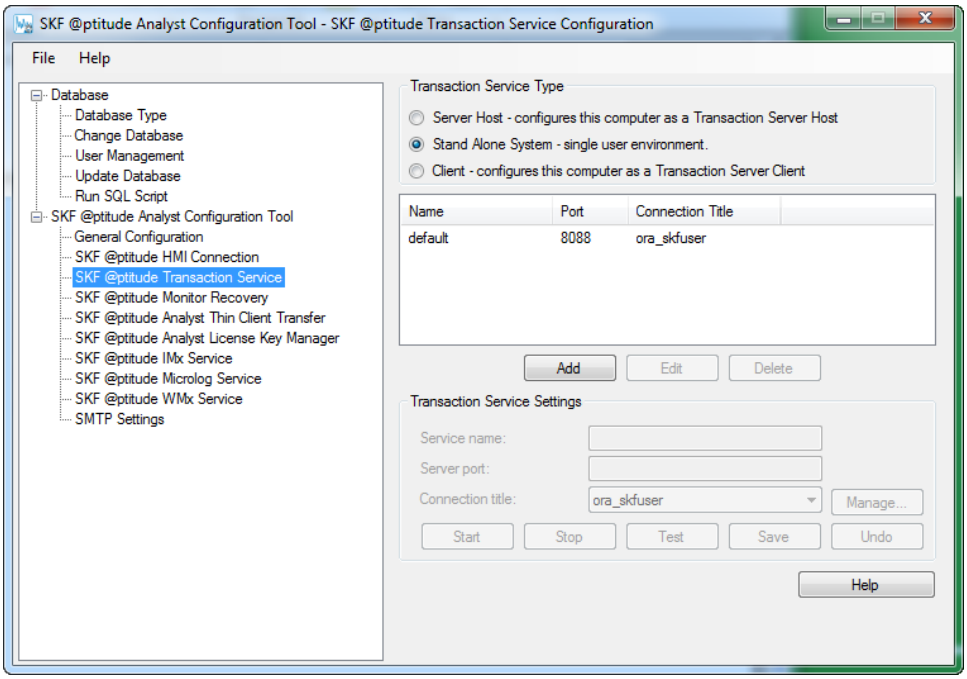


Figure 9 - 7.
SKF @ptitude Analyst Configuration Tool.

- Select **SKF @ptitude Transaction Service** in the left panel. The right panel displays information about the available transaction service entries.
- Select the desired service in the list. Multiple actions become available.

  ➢ Refer to *SKF @ptitude Analyst Installation Manual (P/N 32312400)*, *Chapter 2*, *SKF @ptitude Analyst Configuration Tool*, for descriptions of the configurations.

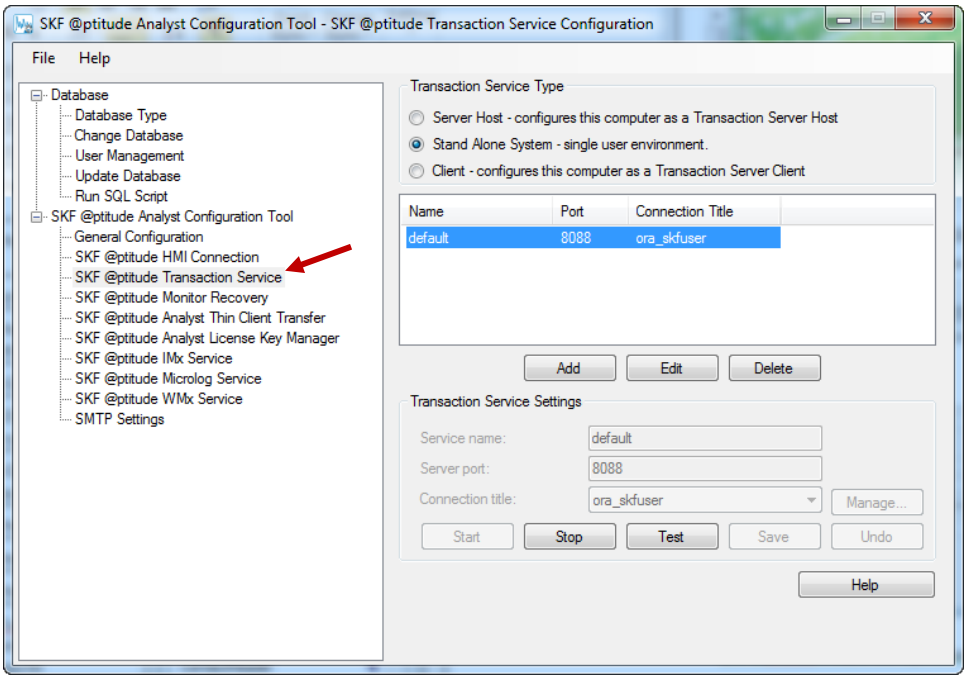


Figure 9 - 8.
Transaction Service Selected.

- If the **Stop** button and the **Test** button are available as shown above, click **Test** to verify that the service is running. A response displays the results of the connection test.

  - If the **Stop** button appears dimmed and unavailable but the **Start** button is active, then the service is *not* running. Click **Start** to initiate the service, and then click **Test**.

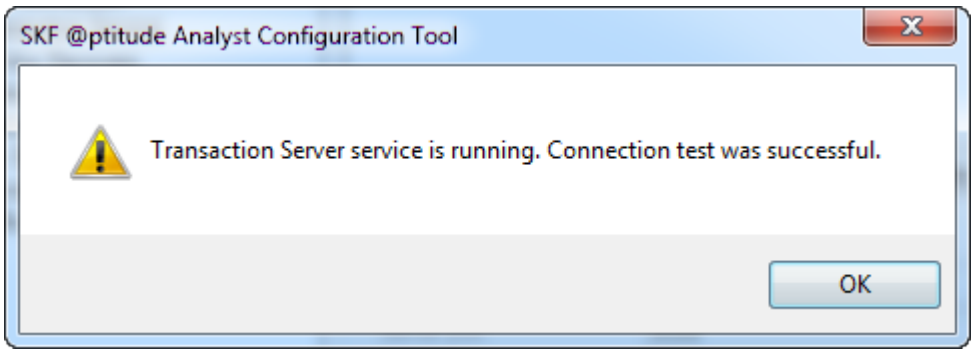


Figure 9 - 9.
Transaction Server Service Test Result.

Click **OK** to close the message, and then close the SKF @ptitude Analyst Configuration Tool.

- If the transaction service appears to be running, but there are XML files accumulated in the input directory, you may need to stop and then restart the service.

SKF @ptitude Analyst Database Maintenance

In SKF @ptitude Analyst, you can specify the schedule for archiving collected measurement data. Use this feature to maintain the database capacity and keep it from exceeding storage limitations.

Go to the **POINT Properties / Scheduler** tab to set the archive parameters.

- IMPORTANT: **Short term archive**, **Long term archive** and **Keep current data** for settings operate ONLY with the Scheduler's archive process or when using the Monitor application's archive feature. They do not apply to Manual archives.

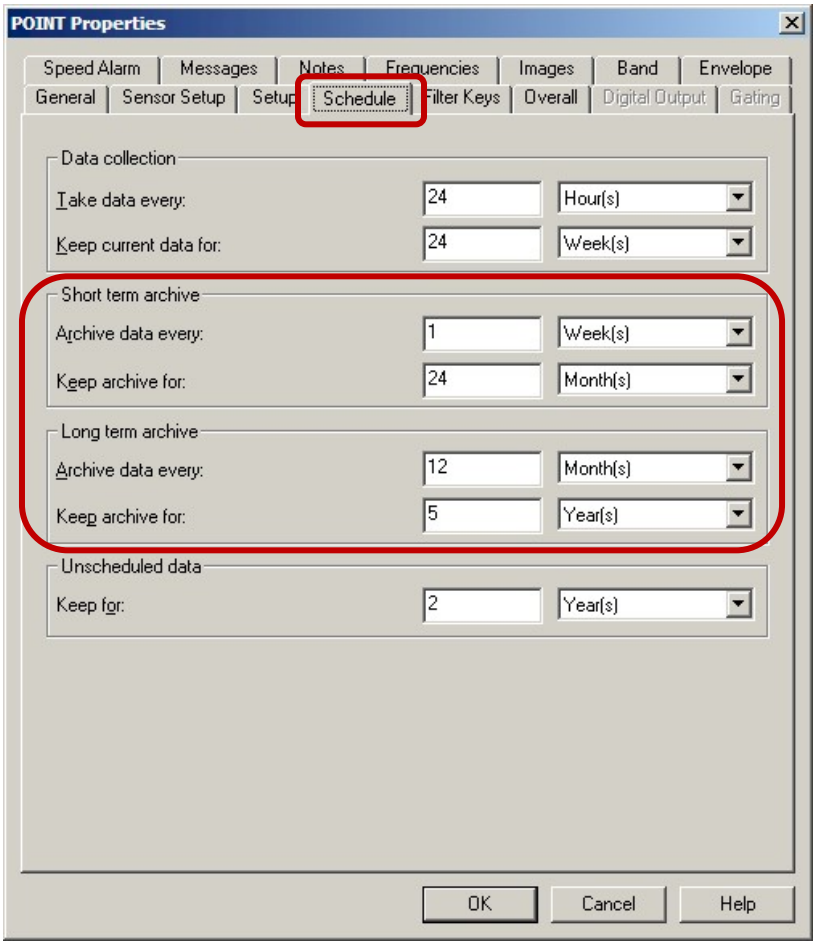


Figure 9 - 10.
Short Term Archive and Long Term Archive Parameters.

Short term archive section fields include:

Archive data every – Determines whether data leaving the "current data" bin is archived in the "short term archive" bin. Enter a numerical value to indicate how often data leaving the "current data" bin is stored in the "short term archive" bin and select appropriate units (**Wk(s), Mo(s), Yr(s)**).
As scheduled archives occur, measurements leaving the "current data" bin are accepted into the "short term archive" bin only if this **Archive data every** setting has expired

since the last measurement was stored in the "short term archive" bin. Otherwise, they are discarded.

Keep archive for – Enter a numerical value to indicate how long to keep (store) the measurement record in the "short term archive" bin and select the appropriate units (**Wk(s), Mo(s), Yr(s)**). When the specified time of storage elapses and a scheduled archive process performed, the measurement is typically moved from the "short term archive" bin into the "long term archive" bin (or is discarded) as specified in the **Long term archive** fields.

Long term archive section fields include:

Archive data every – Determines whether data leaving the "short term archive" bin is archived in the "long term archive" bin. Enter a numerical value to indicate how often data leaving the "short term archive" bin is stored in the "long term archive" bin and select appropriate units (**Wk(s), Mo(s), Yr(s)**).
As scheduled archives occur, measurements leaving the "short term archive" bin are accepted into the "long term archive" bin if this **Archive data every** setting has expired since the last measurement was stored in the "long term archive" bin.

Keep archive for – Enter a numerical value to indicate how long to keep (store) the measurement record in the "long term archive" bin and select the appropriate units (**Wk(s), Mo(s), Yr(s)**). When the specified time of storage elapses and a scheduled archive process is performed, the measurement is discarded.

Example – If you set this **Archive data every** setting to 1 week, the measurement(s) leaving the "current data" bin are placed in the "short term archive" bin as there is no data yet stored in the "short term archive" bin. After the **Keep archive for** setting of 24 months expires and a scheduled archive process is performed, measurement(s) that exceed the **Keep for** setting and are typically moved from the "short term archive" bin into the "long term archive" bin as specified in the **Long term archive** fields.

With the long term **Archive data every** setting of 12 months, after 12 months expires and a scheduled archive process is performed, measurement(s) stored in the "short term archive" bin are moved into the "long term archive" bin. After the **Keep archive for** setting of 5 years expires and a scheduled archive process is performed, the measurements are discarded.

Chapter Summary

To summarize the activities in this chapter, we have:

- Configured the XML import in SKF @ptitude Analyst.
- Seen an example of the hierarchy items that DataController will create in SKF @ptitude Analyst after the SKF Multilog WVT has been provisioned and joined the network.
- Verified the transaction service is running.

In the next chapter, we will see how to provision the SKF Multilog WVT device.

10
Provisioning the Network Devices

With DataController installed, the service running, and the device global configuration completed, the SKF Multilog WVT device is ready to be powered on and join the network for the first time. This chapter describes the provisioning process and the two methods used to accomplish it: over-the-air provisioning or provisioning with a handheld device. Provisioning is the final step in establishing a fully operational SKF Multilog WVT in the network.

About Provisioning

A device in the factory default state can join the network as an unprovisioned device. The device already has a 64-bit EUI64 identifier programmed into it. In this state, the WDM contains only the basic details about the device, such as the Tag Name, but there is no active communication between the WDM and the unprovisioned device. To enable the SKF Multilog WVT device to actively communicate with the network, the device has to be provisioned. The provisioning operation authenticates the device onto the network by providing it with security keys from the WDM.

The SKF Multilog WVT can be provisioned by using either over-the-air provisioning (supported by OneWireless release 220.1.67, or later) or a handheld provisioning device. With the over-the-air method, when you accept an unprovisioned device through the user interface, the WDM sends the provisioning security data to the device and the device then transitions to provisioning state. The device sends a join request to the WDM, which then initiates the join process to establish active communication.

With the handheld provisioning device method, the security keys from the WDM are downloaded to the Provisioning Device and then transferred from it to the SKF Multilog WVT through their Infrared (IR) ports. You can use an iPAQ handheld, which is a type of pocket PC or personal digital assistant (PDA). Hewlett-Packard's current line of iPAQ devices includes PDA devices, Smartphones and Global Positioning System (GPS) navigators. These devices use a Windows Mobile interface. In addition, there are several Linux distributions that will also operate on some of these devices.

Before you begin provisioning, make sure that:

- The device to be provisioned is powered on.
- If you are using a handheld Provisioning Device, make sure that the Provisioning Device Application has been installed on the handheld device. Refer to the WDM user manual from Honeywell: *OneWireless Wireless Device Managers User's Guide*, *Chapter 5.1.3*.
- If you are using a handheld Provisioning Device, make sure that the Provisioning Device has been configured with valid security keys from the WDM. Refer to the WDM user manual from Honeywell: *OneWireless Wireless Device Manager User's Guide*, *Chapter 5.1.4*.

Over-the-Air Provisioning Method

Over-the-air provisioning is a two-step process. First, the access point devices must be provisioned. Then, the access points are enabled to provision the field devices, such as the SKF Multilog WVT.

Provisioning Access Point Devices

To provision access point devices using the over-the-air provisioning method:

- Launch an Internet browser.
- Enter the **IP address for the WDM** in the URL box.
- Log on to the WDM user interface. (The default **User ID** is **administrator**. The default **Password** is **password**.) The WDM user interface web page will open.

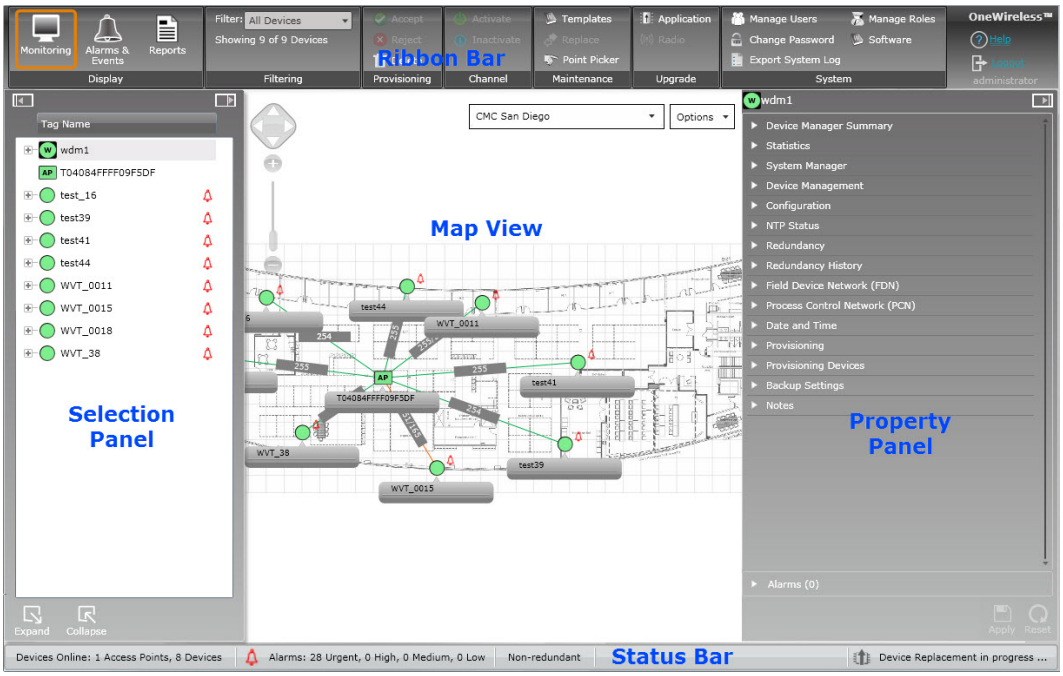


Figure 10 - 1.
WDM User Interface Web Page With Key Section Labels Added.

- In the Selection Panel (left side), select the **WDM**.
- In the Property Panel (right side), expand the **System Manager**.
- Under **ISA100 Network Provisioning**, in the **Over the Air Provisioning** group, select **Enabled**.

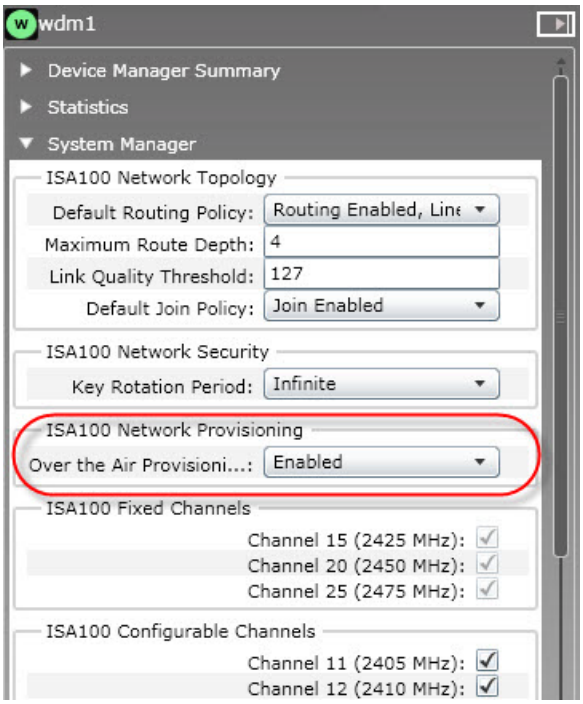


Figure 10 - 2.
Over the Air Provisioning is **Enabled** for the WDM.

- Click the **Apply** button on the lower right of the web page.

The WDM is now enabled for over-the-air provisioning. The unprovisioned access points start appearing in the Selection Panel. You can filter the device list to view only the unprovisioned access points. (Note that with a new network, all devices except the WDM are unprovisioned and appear dimmed or gray.)

- On the ribbon bar, in the **Filter** group, click **Device Status** > **Un-Provisioned**.

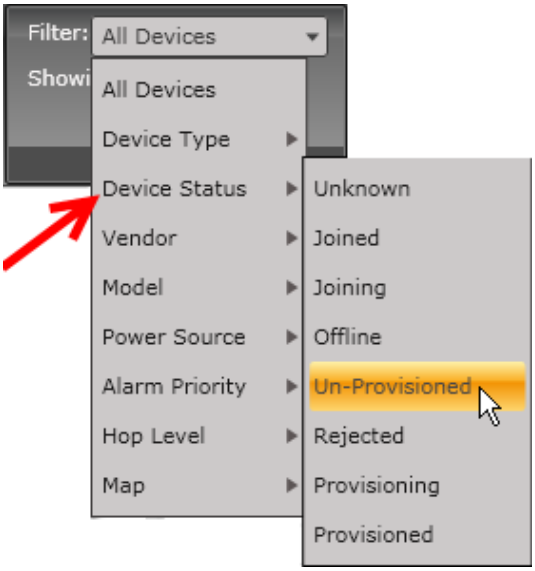


Figure 10 - 3.
Filter Group Options.

Only unprovisioned items will display in the Selection Panel.

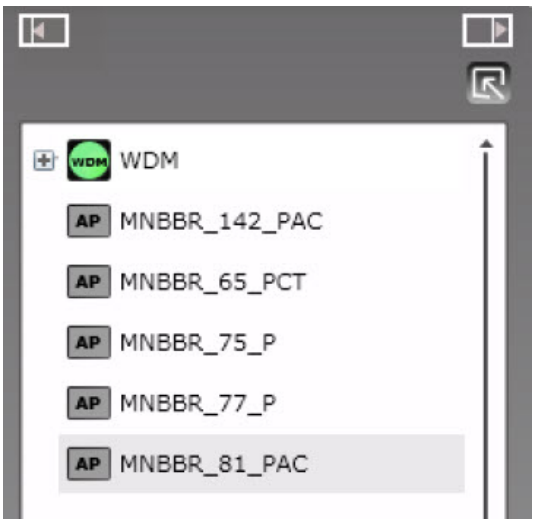


Figure 10 - 4.
List of Unprovisioned Access Point Devices.

- Expand the extended Selection Panel to view the available device parameters.
- Select the required access point in the Selection Panel (or the map view) and then click **Accept** on the ribbon bar.
    - ➢ You can select multiple access points by using SHIFT+click in a successive list. Use CTRL+click to select multiple points not in succession.
    - ➢ It is recommended that you select and accept no more than 10 devices at a time.

The **Accept Over the Air Devices** dialog opens. It displays all the unprovisioned access points that you have selected for enabling over-the-air provisioning.

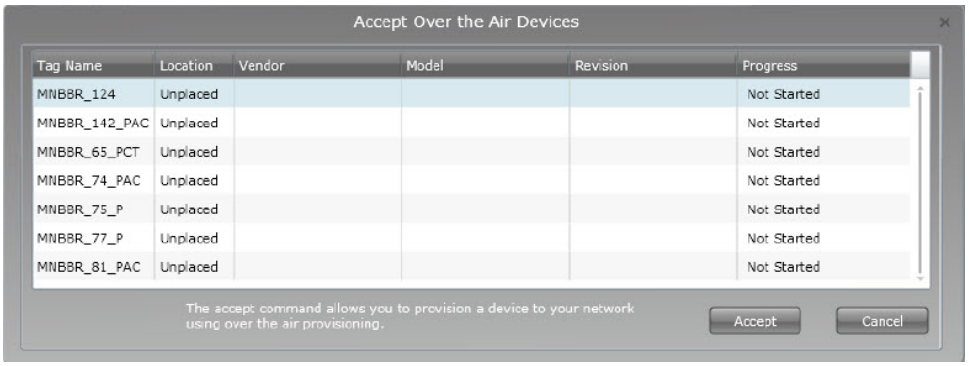


Figure 10 - 5.
Accept Over the Air Devices Dialog.

- Click **Accept**. The Progress column displays the status as **In Progress**, **Provisioning**, and then **Completed** when complete. Do not close the dialog box until the status is **Completed**.
- Click **Close** to close the dialog.

Provisioning SKF Multilog WVT Devices

To provision SKF Multilog WVT devices using the over-the-air provisioning method:

- Launch an Internet browser and log on to the WDM user interface, as described above. (The default **User ID** is **administrator**. The default **Password** is **password**.)
- In the Selection Panel, select the **access point** associated with the SKF Multilog WVT devices.
- In the Property Panel, expand **Device Management**.
- Scroll down to the **Over the Air Provisioning** group and click **Enable for 60 Minutes**.

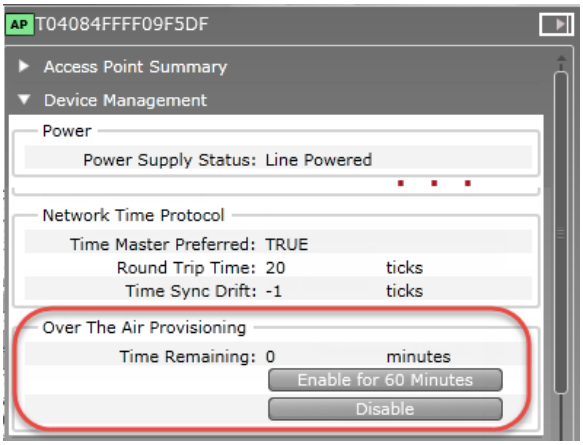


Figure 10 - 6.
Access Point Enabled for Over-the-Air-Provisioning.

The selected access point is now enabled to function as an over-the-air provisioning device for the next 60 minutes. Unprovisioned field devices, such as the SKF Multilog WVTs, start appearing in the Selection Panel. You can filter the device list to view only the unprovisioned field devices.

> ➢ If you do not accept or reject the devices within 60 minutes, the devices will automatically disappear from the web page.

- On the ribbon bar, in the **Filter** group, click **Device Status** > **Un-Provisioned**.
- Expand the extended Selection Panel to view the available device parameters.
- Select the required SKF Multilog WVT devices in the Selection Panel and then click **Accept** on the ribbon bar.

> ➢ You can select multiple access points by using SHIFT+click in a successive list. Use CTRL+click to select multiple points not in succession.
>
> ➢ It is recommended that you select and accept no more than 10 devices at a time.

The **Accept Over the Air Devices** dialog opens. It displays all the unprovisioned field devices that you have selected for enabling over-the-air provisioning.

- Click **Accept**. The Progress column displays the status as **In Progress**, **Provisioning**, and then **Completed** when complete. Do not close the dialog box until the status is **Completed**.
- Click **Close** to close the dialog.

⚠IMPORTANT: Repeat the procedure above to enable over-the-air provisioning capability in line powered FDAP routers. This enables the line powered FDAP routers to provision distant nodes in the network.

Rejecting an SKF Multilog WVT from Joining the Network

If a device on the list needs to be provisioned using a different access point, reject the device and then delete it from the WDM's web page user interface so that the device can rejoin through the appropriate access point for provisioning.

> ➢ The **Reject** action is important because a device establishes a communication link with the access point once it attains the unprovisioned state. The link persists even if the device is *not* provisioned using the connected access point.

To reject a device from joining the network using over-the-air provisioning:

- Select the device and click **Reject** in the ribbon bar. The **Reject Over the Air Devices** dialog opens.
- Click **Reject**. The Progress column displays the status as **In Progress**, **Provisioning**, and then **Completed** when complete. Do not close the dialog until the status is **Completed**.
- Click **Close** to close the dialog.

Handheld Device Provisioning Method

➢ The site should already have a provisioning device loaded with the provisioning software and data.

To provision the SKF Multilog WVT using the handheld provisioning method:

- On the Program's desktop of the PDA, tap the **Provisioning Device** icon. The **Provisioning Device** application launches.

Figure 10 - 7.
Provisioning Device Icon and Application Options.

- Tap **Provisioning** from the application options. The **Provisioning** menu screen displays.

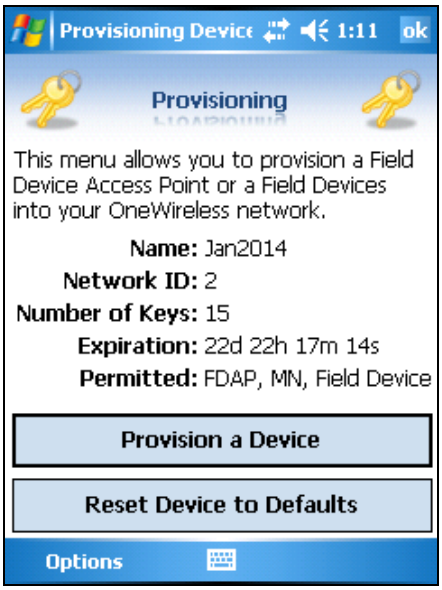


Figure 10 - 8.
Provisioning Menu Screen.

- On the right side of the SKF Multilog WVT unit, press the LCD display push button and look for the message **<IR>** in the bottom banner of the unit's display.
- Then, aim the PDA's IrDA port toward the SKF Multilog WVT display at a distance of no more than 15 cm (6 in.).

Figure 10 - 9.
PDA IrDA Ports.

- Tap the option **Reset Device to Defaults** to prepare the device to be initialized by the DataController software. (Resetting takes about five seconds.)
- Next, tap the option **Provision a Device** to start the process. One of the keys loaded into the PDA (in this example there are 15 keys) will be used to authenticate the SKF Multilog WVT unit. Wait until the screen displays the message **Device provisioned successfully**. Alternatively, a fail message will appear with an explanation of why the process failed.
- Tap **OK** to accept the message.

After the SKF Multilog WVT devices are provisioned, they should connect to the network in a short while and appear in the Selection Panel on the left side of the WDM user interface.

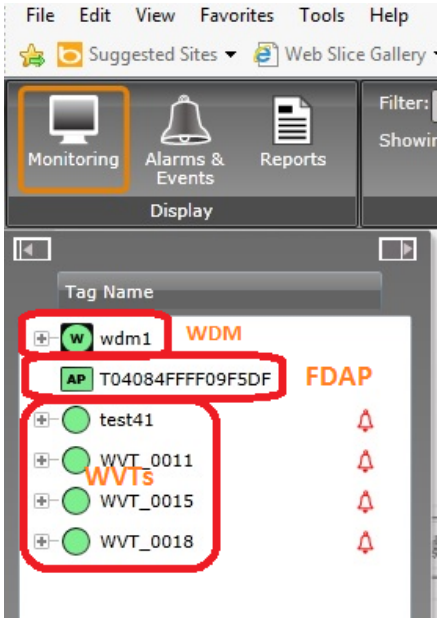


Figure 10 - 10.
Selection Panel Showing SKF Multilog WVTs Connected.

Chapter Summary

To summarize this chapter, we have discussed the purpose of provisioning and described how to:

- Use over-the-air provisioning for access point devices and for SKF Multilog WVT devices.
- Reject an SKF Multilog WVT device from joining.
- Provision using a handheld device.

At this point, the SKF Multilog WVT device has joined the network as a provisioned device. It is now a field mounted monitoring device within a OneWireless network, as designed.

Appendix A
Installing the Sensors

Detailed procedures for installing the CMSS 2350T-D2 sensors and the Namur tacho are provided below. The topics include:

- Vibration Sensor Mounting
- Sensor Installation Instructions
- Mounting Pad and Sensor Installation Instructions
- Speed Sensor/Namur Tachometer Installation Instructions
- The Sensor Mounting Toolkit

Vibration Sensor Mounting

Select the sensor location. For dryer bearing sensors, this is usually at the bottom quadrant of the bearing in the load zone, 90° to 120° either side of the bottom dead center, as shown in the figure below. When selecting the sensor location, keep in mind the easiest and most efficient cable routing and the need for future maintenance where sensors and/or cabling may have to be moved or removed.

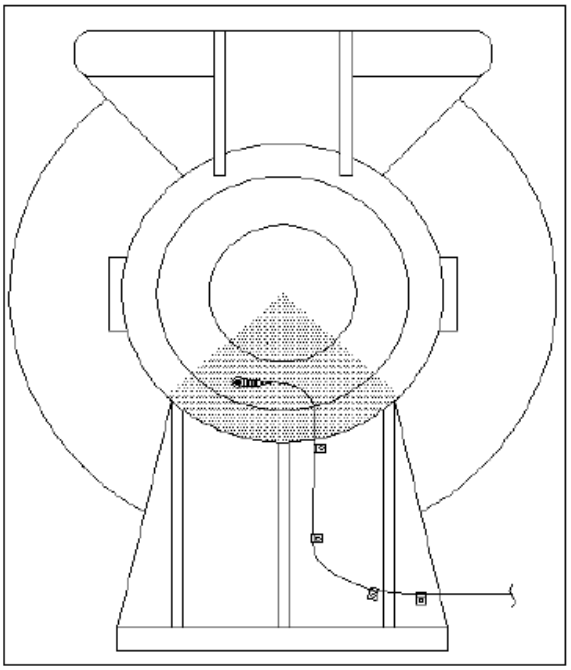


Figure A - 1.
Example of Sensor Location and Bottom Dead Center.

Sensor Installation Instructions

Note: Mounting toolkit SKF CMAC 9600-01 is for ¼-28 stud. Mounting toolkit SKF CMAC 9600-02 is for the M8 adapter.

1. Drill a pilot hole (the drill bit is contained in the optional mounting toolkit).
   Use #3 drill bit x 0.35 in. deep for ¼-28.
   Use 6.7 mm drill bit x 8.9 mm deep for M8 adapter.
2. Using piloted endmill, make 1 in. (2.5 cm) diameter spot face. Use cutting fluid and slow speed to extend endmill life.
3. Create threads in pilot hole using the bottom tap. Clean out hole and spot face surface.
4. Apply thread locking compound to sensor mounting screw.
5. Thread sensor screw onto mounting surface, observing maximum torque (24 lbf-in., 2.7 N-m).
6. Apply silicone dielectric grease to sensor connector socket. Fill connector half full with dielectric grease.
7. Align the connector with the accelerometer socket key. Push connector firmly onto accelerometer and screw on connector for the IP67 rating.
   Note: Remove connector by pulling straight out, slightly wiggling the connector.
8. Install first cable restraint within 8 in. (20 cm) of sensor; install additional cable restraints every 18 to 24 in. (45 to 60 cm).
9. Trim cable to length as needed.

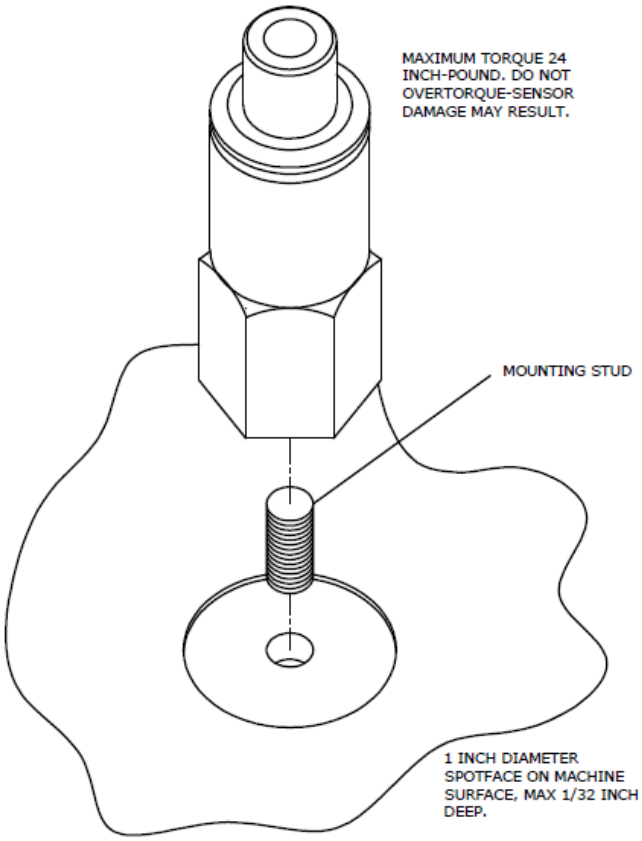
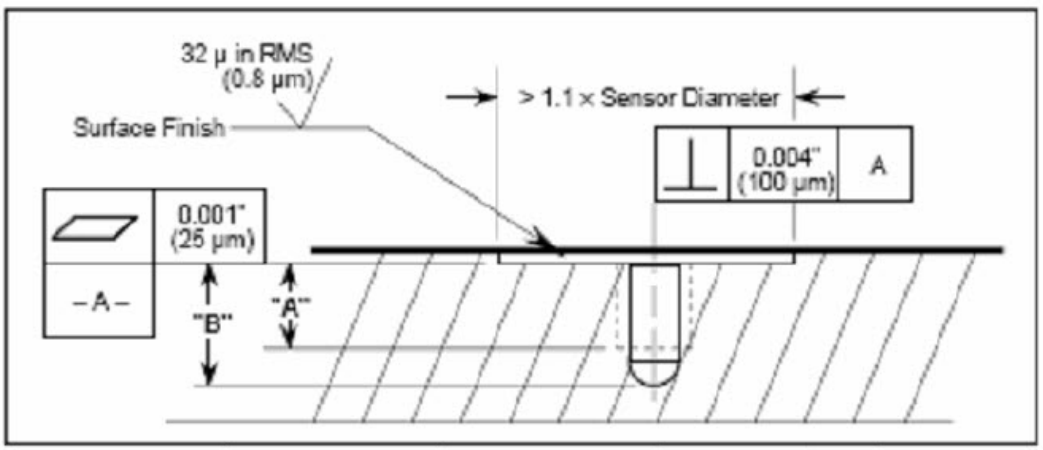


Figure A - 2.
Sensor Installation Diagram.



Stud Size	"A" Dimension inches (mm)	"B" Dimension inches (mm)	Torque in-lbs (N-m)
¼-28 UNF	0.250 (6.35)	0.350 (8.90)	24 (2,7)
M8 x 1.25 (metric)	0.250 (6.35)	0.350 (8.90)	24 (2,7)

Figure A - 3.
Surface Preparation Details.

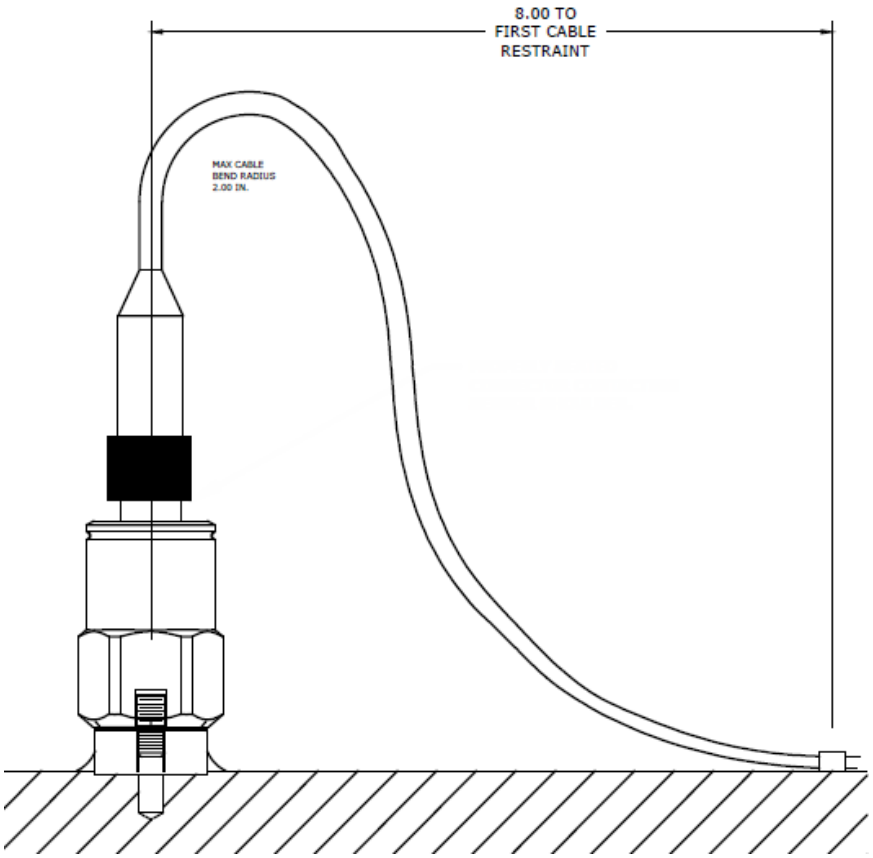


Figure A - 4.
Properly Seated Connector and First Cable Restraint.

Mounting Pad and Sensor Installation Instructions

1. Drill pilot hole (the drill bit is contained in the optional mounting toolkit).
   Use #3 drill bit x 0.35 in. deep for $\frac{1}{4}$-28.
   Use 6.7 mm drill bit x 8.9 mm deep for M8 adapter.
2. Using piloted endmill, make 1 in. (2.5 cm) diameter spot face. Use cutting fluid and slow speed to extend endmill life.
3. Remove sensor mounting screw from sensor to use as a handhold. Install mounting screw onto mounting pad. Thread screw to full depth of mounting pad to prevent adhesive entry into pad threads.
4. Using oil free cleaner, thoroughly clean machine surface and mounting pad. Avoid contamination. Do not touch any surfaces after cleaning.
5. Thoroughly mix acrylic adhesive.
6. Apply generous amount to mounting pad bottom.
7. Place mounting pad onto spot face; excess adhesive will ooze around pad perimeter.

8. Apply extra adhesive, as needed, to perimeter of mounting pad and form radius to prevent fluids from migrating under pad. Immediately remove any adhesive from pad top surface.
9. Hold mounting pad in place 1 to 2 minutes until adhesive begins to set. After 1 hour setting time, carefully unthread screw from pad. Adhesive full cure time is 24 hours.
10. Apply thread locking compound to sensor mounting screw.
11. Thread sensor screw onto mounting pad, observing maximum torque (24 lbf-in., 2.7 N-m).
12. Apply silicone dielectric grease to sensor connector socket. Fill connector half full with dielectric grease.
13. Align the connector with the accelerometer socket key. Push connector firmly onto accelerometer and screw on connector for the IP67 rating.

    - Remove connector by pulling straight out, slightly wiggling the connector.

14. Install first cable restraint within 8 in. (20 cm) of sensor; install additional cable restraints every 18 to 24 in. (45 to 60 cm).
15. Trim cable to length as needed.

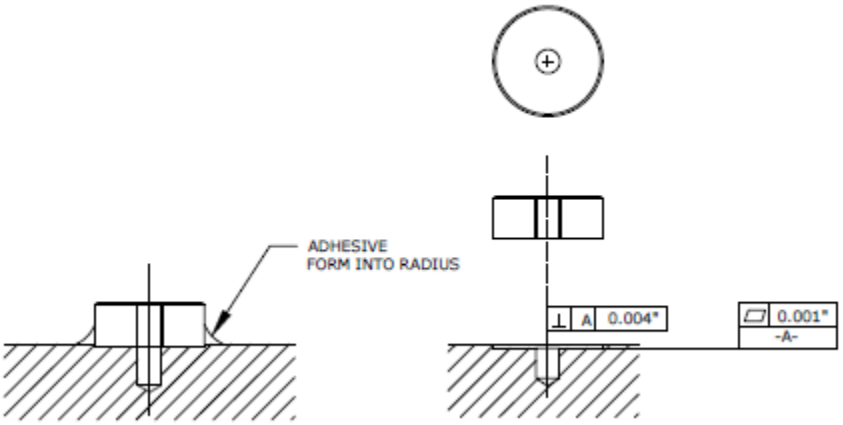


Figure A - 5.
Mounting Pad Installation, Surface.

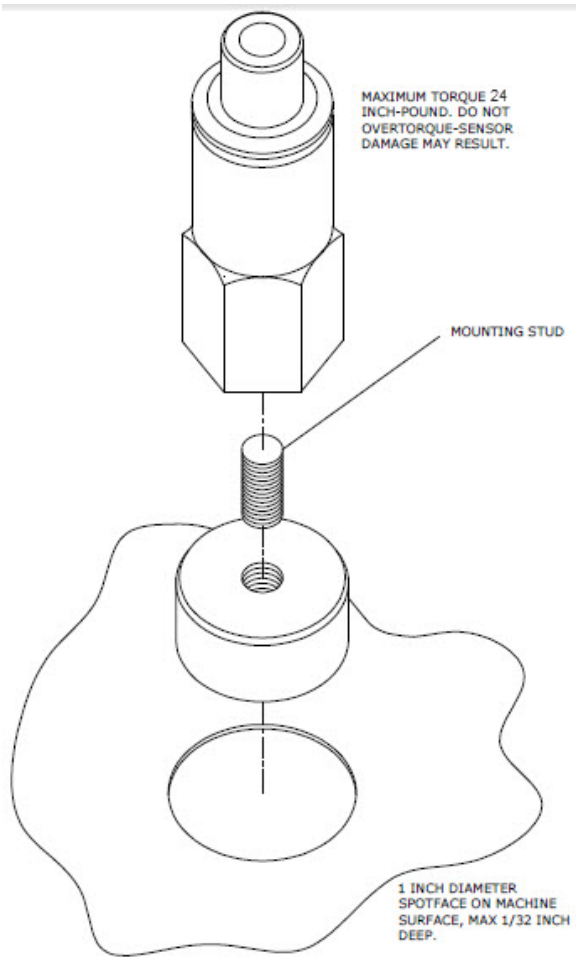


Figure A - 6.
Mounting Pad Installation, Sensor.

For additional details, see also the previous figure titled: Properly Seated Connector and First Cable Restraint.

Speed Sensor / Namur Tachometer Installation Instructions

Many installations require a speed reference to be installed. SKF offers the Namur tachometer to be employed where a speed signal is required. The Namur tacho is a two-wire low power type (minimum operating level 5 V, no target output nominal 3 mA, target output nominal 1 mA). The LED will flash whenever an event is sensed.

A custom mounting bracket is usually required (not included in the installation kit) to hold the speed sensor firmly. The simplest bracket design uses a suitably sized portion of $\frac{1}{4}$ inch thick Angle Plate. The sensor hole may be drilled and both jamb nuts employed to hold sensor adjustment, or tap the bracket and use only one jamb nut to hold final sensor adjustment.

Two holes are recommended for fasteners to hold the bracket firmly to machine support or machine surface.

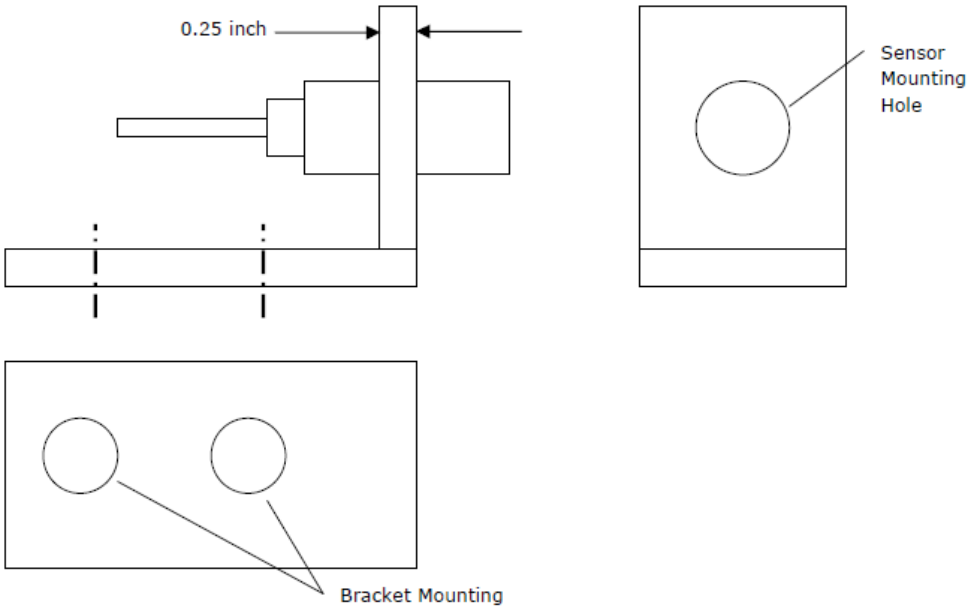


Figure A - 7.
Mounting Bracket for Namur Tacho.

The Namur tacho provides an output signal whenever an event passes under the sensor tip. The event is typically a notch or keyway that passes under the sensor; alternatively, the sensor will produce a signal whenever a key or projection passes under the tip. An LED installed at the rear of the sensor flashes when the event is sensed.

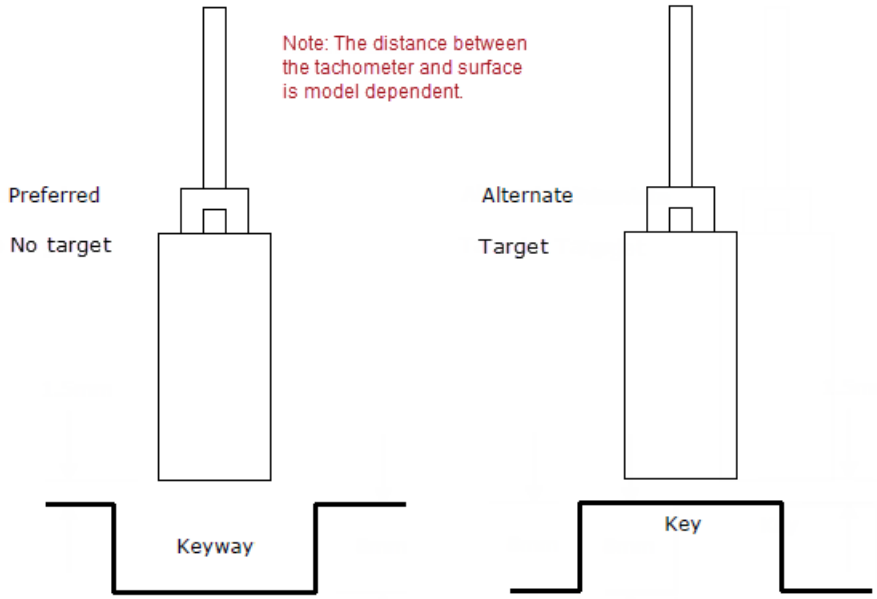


Figure A - 8.
Namur Tacho Mounting.

The Sensor Mounting Toolkit

The sensor mounting toolkit is optional. Two models are available:

- **CMAC 9600-01** Toolkit for spot face, 1/4-28 mounting
- **CMAC 9600-02** Toolkit for spot face, M8 adapter

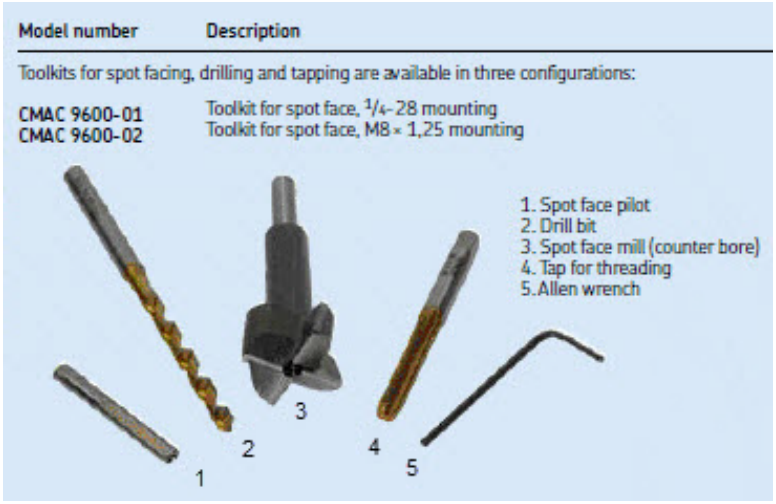


Figure A - 9.
Toolkits for Spot facing.

Physical

- Weight: 90 g *(3.2 oz.)*
- Case material: 316L stainless steel
- Mounting:
  - Sensor internal 1/4-28 thread
  - 1/4-28 to 1/4-28 mounting stud and 1/4-28 to M8 mounting adapter provided

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