PTC SOFTWARE PRODUCTS
LICENSING BASIS FOR THINGWORX AND KEPWARE PRODUCTS

Scope of this Document

This document sets out the licensing basis and restrictions for each of PTC's ThingWorx and Kepware Licensed Products. In most cases, this document is incorporated into the legal documents governing the Customer's use of software licensed from PTC (collectively the "License Agreement"). In the event of inconsistency between this document and the PTC quote pursuant to which the Customer purchased the licenses (the "Quote"), the Quote shall govern. For example, this document may identify that a product is licensed in a particular way, but if the product name on the Quote specifies a different licensing basis, the Quote shall govern. PTC may update this document from time to time, but each purchase made by the Customer will be governed by the most current version of this document in effect at the time of the purchase.

DESCRIPTION OF COMMON LICENSING BASES

"Designated Computer" (DC): Where the product name contains the words "fixed," "locked," or "node locked," and for all "Kepware" and "KepServerEx" products, such products are licensed to operate solely on the designated computer on which they are installed. It is not permitted to move Designated Computer licenses from one computer to another by means of installing such products on an external, portable or removable device (e.g., USB dongle, NAS, Router, memory stick, USB drive, external hard drive) or through other means.

"Designated Server" (DS): Each Designated Server product may only be used on the computer server that is designated by the Customer in connection with the initial installation of the product and that has one unique Instance of the applicable installed product application. In the event a computer server is partitioned in any manner (physically, logically or otherwise), the reference in the preceding sentence to "computer server" shall mean each partition of such server, and such Designated Server product may only be used on one of such partitions.

"Per Core" (PCO): For Per Core products, a license is required for each core of a processor within a system with which the applicable product is executed, as reported by the operating system running the applicable product. For example, if a device is executing PTC software that is licensed on a Per Core basis, assuming each device has two multi-core processors, each with two cores that all execute the software, four licenses would be required. Likewise, if the device had three single-core processors that all execute the software, three licenses would be required. If the operating system that runs the applicable product is within a virtual system (such as VMware) with two virtual cores allocated to the operating system running the applicable product, two licenses are required.

"Registered User" (RU): Registered User products may only be used by a single individual without regard to how often the person uses the license. A license is required for every such individual, regardless of whether the individual is accessing the Licensed Product directly or via an intermediate application. Shared passwords or log-in accounts are not permitted unless the licensing basis for the particular product below specifies to the contrary. The Customer may add and/or substitute from time to time new Registered Users as long as the aggregate number of Registered Users does not exceed at any point in time the number of licenses in effect at such time for that particular product and, provided further, that if a person who was previously a Registered User returns to Registered User status, a new license fee must be paid to PTC at PTC's then current rates unless the licensing basis for the particular product below specifies to the contrary.

"Demo and Test": Products licensed on a "demo and test" or "non-production" basis (or similar designation), such Licensed Software may not be used in a production environment.

Packages (P): The licensing basis for each component of a PTC product package shall be the same as if such component were being licensed separately, except that the components of each package may only be used with the base seat in the package. For example, the Windchill PDMLink and Windchill ProjectLink Registered User Licenses bundled with the Creo Enterprise XE Package are Licensed on a Registered User basis and must be assigned in combination to a single Creo user.

Bundles (B): Each PTC Bundle contains several different PTC Licensed Products and the licensing basis for each such Licensed Product may differ from the other Licensed Products included in that Bundle.

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LICENSE RESTRICTIONS COMMON TO MULTIPLE PRODUCTS

Subscriptions. A "Subscription" is a on-premise License type that includes a License for a term as specified in the product name, Quote, order agreement or other order documentation, and/or the invoice, and such License includes Support Services during such License Term at no additional fee.

Perpetual Licenses. PTC does not have perpetual license models for most products. Where PTC does sell perpetual licenses, however, and such product includes components that are provided by PTC on a hosted or SaaS basis (e.g., Creo AR Design Share), PTC may discontinue providing such hosted components at any time.

Virtualization Technologies. Although in some cases it may be possible through the use of virtualization technologies to circumvent the license control mechanisms that PTC employs in order to enforce the above licensing schemes, or to circumvent the intent of such licensing schemes, such practices violate the Customer's License Agreement with PTC. Without limiting the foregoing, Customers may not install or access Designated Computer licenses (also sometimes referred to as "node locked licenses") on or through virtualization technologies.

Upgrades. For PTC software licensed as an upgrade from a previous version, the Customer must first be licensed for the software identified by PTC as eligible for the upgrade and Customer must be active on Support Services for such software at the time Customer purchases the relevant upgrade. After installing the upgrade, the software licensed as an upgrade replaces and/or supplements the product that formed the basis of the Customer's eligibility for the upgrade and the Customer may no longer use the original software that formed the basis for the Customer's upgrade eligibility.

Interoperability Tools/Toolkits. PTC interoperability tools (e.g., Pro/TOOLKIT, or J-Link, Pro/Web.Link and application programming interfaces) are provided solely for purposes of enabling the Customer (itself or with the assistance of a third party) to cause the Licensed Products to interoperate with the Customer's other computer systems and programs. Customer shall not distribute to any third party all or any part of any such interoperability tool or use such interoperability tools to develop an integration for distribution to third parties.

Batching. For license types based on numbers of users (e.g., Registered User, Concurrent User, etc.), a License is required for each individual who accesses such Licensed Product or the functionality or data contained therein, whether directly or through a web portal or other mechanism for "batching" or otherwise achieving indirect access to the Licensed Product or such functionality or data. Generic or shared log-ins are not permitted.

Definition of Instance. An "Instance" means a deployment of application servers, all of which are located in one physical location and a shared database.

THINGWORX CORE PRODUCTS

PTC has the following licensing models for ThingWorx core products: (i) the ThingWorx Smart Connected Products model, and (ii) the ThingWorx Smart Connected Operations model. Each of these licensing models is described below. Under both of the models, it is not permitted to: (a) use the ThingWorx Licensed Products in order to develop applications that Customer makes available for use by third parties (except under the ThingWorx SCP model to make Customer's physical products internet-enabled), or (b) allow the Customer's customers to install the Licensed Products either on such customers' premises or at third party premises for such customers.

ThingWorx products will be shipped to the Customer location set forth in an Order or Quote, but Customer may also install, operate and use such ThingWorx products at any of the Customer's site(s) throughout the world, notwithstanding any restrictions in the License Agreement in relation to limiting use of Licensed Products to the country of installation, but subject to compliance with all applicable export laws,

restrictions and regulations. Customer further agrees that it will be responsible for all taxes, duties and other fees and amounts attributable to the use of the ThingWorx products at locations other than the install location set forth in an Order or Quote.

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<u>ThingWorx Smart Connected Products ("ThingWorx SCP")</u>

The ThingWorx SCP model allows Customers to license the IoT Platform for connecting Customer's products and for building and running IoT applications. The licensing basis for each Licensed Product in the ThingWorx SCP model is detailed in the table below:

Licensed Product Name	Licensing Basis
ThingWorx SCP Platform Edition (1)	SCP
SCP Registered Users (2)	RU
Assets (3)	IoT
ThingWorx Analytics (4)	Per Core
Software Content Management	License required for each Production Instance (as defined below in note 1 below)
Additional Production Limited Instance (5)	SCP
SCP Runtime App (6)	SCP

There are different ThingWorx SCP Platform "Editions": Premium Edition, Professional Edition, and Enterprise Edition. Each ThingWorx SCP Platform Edition includes one Instance for production usage and an unlimited number of Instances for non-production use only. Each ThingWorx SCP Platform Edition includes a designated number of SCP Registered Users, Assets, and ThingWorx SCP Platform Edition-specific features as set forth in the table below. The ThingWorx SCP Platform can be installed on the Customer's physical premises or at the Customer's designated hosting provider. Each ThingWorx SCP Platform Edition includes the "ThingWorx agents" or "Edge Microservers" and a ThingWorx SDK used by the Customer to add connectivity into the Customer's run-time applications. The "ThingWorx agents," "Edge Microservers," and Customer's applications created with a ThingWorx SDK are unlimited and distributable with connected products, but only for use with ThingWorx products.

	Premium Edition	Professional Edition	Enterprise Edition
Assets (included)	50	75	100
SCP Registered Users (included, more may be purchased separately)	5	5	5
View-Only SCP Users	Included		
ThingWorx Analytics	Not available	8 cores included	16 cores included
ThingWorx Foundation	Included		
Technical Support	Silver	Gold	Gold (Gold+ may be purchased as an upgrade)
Software Content Management	Not available	Not included	Included
ThingWorx Flow	Included		
ThingWorx Active-Active Clustering	Included		
SCP Accelerator	Included		

 "SCP Registered User" (designated as "IoT") means a log-in ID that enables access to the ThingWorx Platform directly or via an intermediate application for use by a person who is authorized by the system administrator to develop mashups, applications and/or dashboards using the Licensed Product. This licensing basis is a variant of the Registered User licensing basis. Users are counted on an individual basis, not on a concurrent basis.

"View-Only SCP Users" are users of the Licensed Product that are authorized only to consume outputs from the ThingWorx Platform. View-Only SCP Users may not be authorized to, and must not, develop or modify mashups, applications or dashboards. View-Only SCP Users may have a log-in, or might be someone (e.g., a service desk employee) who accesses data through another system or through a shared log-in or screen. View-Only SCP Users are unlimited and included with the ThingWorx SCP Platform.

"Asset" (designated as "IoT") (also sometimes referred to in the product itself or elsewhere as a "Device" or a "Thing" or a "Remote Thing") means a sensor, device, machine, system, web service, etc. that is modeled (represented) and/or registered as an asset (or "device" or "thing" within the Licensed Product) or any separately defined part of the foregoing if it is being treated as a separate asset within the software. For example, without limitation, an Asset could be a brake press, industrial dryer, another computer system, or a set of individual components within those machines if modeled or registered as a separate asset in the software), etc.

"Simple Narrow Band Asset" (NB) is a class of Asset that runs on either an industry standard Low Power Wide Area Network (LPWAN) or 5G network with the following additional constraints: No remote access from ThingWorx into the asset, No Software Content Management (SCM) capability, and no file transfer capability. This asset type may also be used for assets that are not connected but are being represented in ThingWorx.

"ThingWorx Analytics" enables machine learning capabilities and other analytic services for the Internet of Things. ThingWorx Analytics may be licensed for use in conjunction with the ThingWorx SCP Platform Professional and Enterprise Editions, only. ThingWorx Analytics is licensed on a Per Core basis. Analytics Server may be run in single-server or distributed mode. In distributed mode, only CPU cores running ThingWorx analytics code (e.g., API interface, analytics workers) require a Per Core license.

Any installed component that delivers analytic computational functionality as indicated in the table above requires a ThingWorx Analytics Per Core license for each physical or virtual CPU core as reported by the operating system on which such component is installed. If the Customer exceeds the compute capacity of the included ThingWorx Analytics cores, the Customer can purchase additional core licenses for additional compute capacity on any of Instance running components that deliver computational functionality.

The Additional Production Limited Instance allows a Customer to deploy an Instance on multiple servers with a corresponding shared database that are not located at one physical location. A license of the Additional Production Limited Instance is required for each such non-collocated server. Where there are multiple databases, however, an additional SCP Platform Edition must be purchased for each such Instance.

"SCP Run-time license" is a ThingWorx Platform license that enables a customer to run their application or solution on a remote device. This Rintime License enables the customer's application or solution to work remotely, but restricts further development in the field.

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ThingWorx Smart Connected Operations ("ThingWorx SCO")

The ThingWorx SCO models allow Customers to license the IoT Platform for connecting and monitoring Customer's internal manufacturing systems, processes, and/or operations related to the production of Customer products. There are several SCO Solutions models, which are sold per Site (as defined below), plus SCO Registered Users. Customers may deploy multiple production and/or non-production ThingWorx servers for each Site purchased.

SCO Solutions Models

Definitions Applicable to SCO Solutions Models

- A "Custom Application" is either: (i) a customization of a standard PTC-provided application, or (ii) a software application not created by PTC that has been built for business use cases for end users, addressing the Customer's needs and requirements. A Custom Application is developed using the ThingWorx platform technology and made up of a combination of backend components, services, and mashups.
- "SCO Registered User" means a person who accesses the ThingWorx Platform directly or via an intermediate application developed on the platform by PTC, customer, or partner. Every person who views or accesses the ThingWorx Platform or intermediate application requires a registered user license, regardless of whether such log-in ID is tied to their unique person or is generic to the device by which they are accessing. Standard & Premium SCO registered users may access the single ThingWorx application per Site they were purchased for. Additional user licenses are required for each additional application at each Site.
- "SCO Solutions Enterprise User" extends the SCO Registered User to access multiple applications when purchased with an SCO Solutions Enterprise bundle per Site.

- "SCO Connected User" means a Registered User who has view-only access to Windchill for the purposes of viewing Work Instructions and related data (documents or drawings) in SCO applications. This license does not entitle the user to general view access in Windchill nor the ability to install and use ThingWorx Navigate View apps.
- A "Site" means a singular customer building or set of connected buildings where the software is being used. In the case of connected buildings there must be no physical barriers between the operations themselves, or the process flow of materials.

SCO Solutions Standard Model – The SCO Standard model permits Customers to use ThingWorx only in connection with PTC-provided applications, and without limitation does not permit Customers to develop Custom Applications. Customer may edit the mashups provided with these out-of-the-box applications (solutions) in the Standard model, but is prohibited from creating new mashups (either directly or by excessively editing the existing mashups). Customer may integrate Standard Model applications with other systems but only for read-only purposes. The licensing basis for PTC's SCO Standard model entails a fee per Site where the application(s) will be deployed. Furthermore, fees are required for each SCO Registered User over the entitled amount per each unique app. The SCO Standard model comes with the entitlements specified in the table below.

SCO Solutions Premium Model - PTC's SCO Solutions Premium model permits Customer to use the ThingWorx platform to create Custom Applications and extend/customize Standard Model applications. A Standard Model application is a prerequisite for each Site to purchase the Premium Model. The licensing basis for PTC's SCO Solutions Premium model entails a fee per Site where any Custom Application will be deployed. Users for the Premium Model must be purchased in addition to the Standard Model as if they are 2 separate applications. The SCO Solutions Premium model comes with the entitlements specified in the table below.

SCO Solutions Enterprise Model - PTC's SCO Solutions Enterprise model permits Customer to access all of the ThingWorx standard applications available at time of purchase (i.e., DPM, AMU, CWC, RTPPM) at a particular Site, and to use ThingWorx to develop Custom Applications for SCO purposes at such Site. The licensing basis for PTC's SCO Solutions Enterprise model entails a fee per Site where the application(s) will be deployed. Solutions Enterprise users may access all applications including custom applications at a Site. Users may be allocated to any Site purchased when purchasing multiple Sites. The SCO Solutions Enterprise model comes with the entitlements specified in the table below.

SCO Solutions Custom Enterprise Model - PTC's SCO Solutions Custom Enterprise model permits Customer to use ThingWorx to develop Custom Applications for SCO purposes at such Site. The Solutions Custom Enterprise Model does not include access to any PTC Standard Model applications. The licensing basis for PTC's SCO Solutions Enterprise model entails a fee per Site where the application(s) will be deployed. Solutions Enterprise users may access all custom applications at a Site. Users may be allocated to any Site purchased when purchasing multiple Sites. The SCO Solutions Custom Enterprise model comes with the entitlements specified in the table below.

	SCO Standard (DPM, AMU, CWC, RTPPM)	SCO Solutions Premium Edition	SCO Solutions Enterprise Edition	SCO Solutions Custom Enterprise Edition
Prerequisite	N/A	SCO Standard (at least one app per Site)	N/A	
SCO Registered Users (included, more may be purchased separately)	25 per application, only to be used for that application	5 (only for administrative use purposes and not to access custom applications)	100 per Site included	
Custom Application included	N/A	Unlimited number of Custom Applications may be created	Unlimited number of Custom Applications may be created	
ThingWorx Foundation	Included with each Edition			
ThingWorx Apps (DPM, AMU, CWC, RTPPM)	Access to app(s) purchased (1 per Site)	Not applicable	All apps included	Purchased Separately
ThingWorx Analytics (1)	As required by app(s)	Included (32 cores)	Included (64 cores)	
ThingWorx Building Blocks	N/A	Included		
ThingWorx Kepware Server (2)	5 ThingWorx Kepware Server Premium Connectivity	5 ThingWorx Kepware Server Premium Connectivity	10 ThingWorx Kepware Server Premium Connectivity	20 ThingWorx Kepware Server Premium Connectivity

	SCO Standard (DPM, AMU, CWC, RTPPM)	SCO Solutions Premium Edition	SCO Solutions Enterprise Edition	SCO Solutions Custom Enterprise Edition
Technical Support	Gold included (Gold+ may be purchased as an upgrade)			
Software Content Management	N/A	Purchased separately		
ThingWorx Flow	N/A	Included		
ThingWorx Active-Active Clustering	Included			

(1) ThingWorx Analytics - The ThingWorx Analytics software referenced in the tables above enable machine learning capabilities and other analytic services for the Internet of Things. ThingWorx Analytics is licensed on a Per Core basis. Analytics Server may be run in single-server or distributed mode. In distributed mode, only CPU cores running ThingWorx analytics code (e.g., API interface, analytics workers) require a Per Core license. Any installed component that delivers analytic computational functionality as indicated in the table above requires a ThingWorx Analytics Per Core license for each physical or virtual CPU core as reported by the operating system on which such component is installed. If the Customer exceeds the compute capacity of the included ThingWorx Analytics cores, the Customer can purchase additional core licenses for additional compute capacity on any of Instance running components that deliver computational functionality.

(2) The Kepware entitlements included with all above SCO Solutions Models are limited to use with the ThingWorx SCO Solutions. The Kepware software included with the SCO Solutions Models may not be used on a standalone basis. Customer may purchase enterprise Kepware connectivity packages for other use cases.

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KEPWARE AND OTHER THINGWORX PRODUCTS

Kepware KepServerEX, ThingWorx Kepware Server (formerly ThingWorx Industrial Connectivity), and LinkMaster and RedundancyMaster These products fall under the Designated Computer (DC) licensing terms, as described in the Common Licensing Basis section above. These products will be shipped to the Customer location set forth in an Order or Quote, but Customer may also install, operate and use such products at any of the Customer's Site(s) throughout the world, notwithstanding any restrictions in the License Agreement in relation to limiting use of Licensed Products to the country of installation, but subject to compliance with all applicable export laws, restrictions and regulations. Customer further agrees that it will be responsible for all taxes, duties and other fees and amounts attributable to the use of these products at locations other than the install location set forth in an Order or Quote.

ThingWorx Single Factory License is a bundle of ThingWorx Kepware Server licenses that are sold per Site (see SCO). The number of Designated Computer licenses is identified in the product description. These licenses come with access to the full suite of Kepware drivers and plugins from the Kepware download page and must be used in support of a single Site.

ThingWorx Kepware Edge licenses are sold per "connected asset" and are limited to a specified number of tags (which is essentially a data item) identified in the product description. The Kepware Edge license includes a connectivity layer that connects a single remote device or gateway to the ThingWorx SCP platform.

ThingWorx Machine Builder (MB) Bundles

The ThingWorx Machine Builder Bundle is a ThingWorx bundle that allows MB Customers to license the ThingWorx Platform for connecting the Customer's products and creating IoT applications that can be shared across the ecosystem. The licensing basis for each Licensed Product in the MB Bundle is detailed in the table below:

	MB Starter	MB Tier 1	MB Tier 2	MB Tier 3
Assets (included)	25	250	1000	2000
SCP Registered Users	5	5	5	5
View-Only SCP Users	Included	Included	Included	Included
ThingWorx Premium	Included	Included	Included	Included
Technical Support	Gold+	Gold+	Gold+	Gold+
ThingWorx Analytics	Purchased separately	Purchased separately	Purchased separately	Purchased separately
Software Content Management	Purchased separately	Purchased separately	Purchased separately	Purchased separately
ThingWorx Flow	Included	Included	Included	Included
Asset Advisor	Included	Included	Included	Included
ThingWorx Kepware Edge SaaS Only	25	250	1000	2000
Vuforia Chalk (5 User) Hosted	Included	Included	Included	Included