

## InnoCielo Global Collaboration Framework



Collaborative Engineering for Global Organizations

white paper

## Table of Contents

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<b>1</b>	<b>Introduction</b> .....	<b>3</b>
<b>2</b>	<b>Creating a Global Collaboration Framework</b> .....	<b>4</b>
	Collaborating Vaults .....	4
	Document Ownership .....	4
	Document Transfer .....	4
	Site Enlistment.....	4
<b>3</b>	<b>Managing Engineering Content Globally</b> .....	<b>5</b>
	Project Collaboration .....	5
<b>4</b>	<b>Ease of Use</b> .....	<b>6</b>
	Collaboration Status .....	6
	Enlist Vault .....	7
	Collaboration Status Management .....	7
<b>5</b>	<b>GCF Configuration</b> .....	<b>9</b>
	5.1 Initial Setup .....	9
	Shared Vault List.....	9
	5.2 Shared Vault Details .....	10
	Privileges.....	10
<b>6</b>	<b>Solution Benefits</b> .....	<b>11</b>
<b>7</b>	<b>Customer Quote</b> .....	<b>11</b>
<b>8</b>	<b>Global Collaboration Framework vs. Publisher Framework</b> .....	<b>12</b>
<b>9</b>	<b>Professional Services Offering</b> .....	<b>12</b>
	<b>Taking EDM to the Enterprise</b> .....	<b>13</b>
<b>10</b>	<b>BlueCielo ECM Solutions</b> .....	<b>13</b>
<b>11</b>	<b>Questions?</b> .....	<b>13</b>
<b>12</b>	<b>Contact info</b> .....	<b>13</b>

## 1 Introduction

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The global economy has led to a paradigm shift for engineering companies operating globally. Engineering activities are increasingly being moved to off-shore locations, or assigned to specialized engineering teams. Simultaneously, the need for global collaboration has increased due to business drivers such as rationalization, time-to-market and compliance. **Consequently, engineering content needs to be shared and exchanged between geographically separated engineering teams working across the world.**

Another major trend in the industry is the outsourcing of engineering, design, construction, operations, manufacturing and maintenance activities. This also increases the need for exchanges of engineering content on a global scale. Smooth and secure collaboration with other companies is essential to keep large projects on schedule and manage the complexities of global operations. **Consequently, engineering content needs to be managed and exchanged in a controlled manner between multiple companies working together across the world.**

Only a global collaboration framework is capable of managing and controlling the seamless exchange of engineering content between teams working internally and externally, increasing the efficiency and improving the effectiveness of outsourced processes. **This is what the InnoCielo Global Collaboration Framework offers.**

## 2 Creating a Global Collaboration Framework

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The InnoCielo Global Collaboration Framework (IC-GCF) is an add-on module to InnoCielo Meridian Enterprise. It enables companies with multiple engineering teams working with InnoCielo Meridian Enterprise to collaborate with each other, while retaining their own separate working environments and processes.

IC-GCF can be used in any of the following scenarios:

- Concurrent and cooperative engineering by geographically separated teams across the world
- Concurrent and cooperative engineering with suppliers of engineering services
- Collaborative environments requiring engineering content to be shared and exchanged between multi-disciplinary teams working across the globe

The GCF has standard rules built-in to provide consistency between documents, vaults and sites.

### Collaborating Vaults

When collaboration between multiple teams is required, remote vaults are **enlisted** to be able to view and work on a document, such as an assembly. Once a vault is enlisted, the assembly and its components are transferred to it. Future updates are also automatically distributed to enlisted vaults. For each document a different set of collaborating vaults can be configured. Within a single product or process structure, substructures can have different sets of collaborating vaults.

### Document Ownership

Each document which is shared between vaults has only one **owner** at any one time. When a vault does not have ownership of the document:

- Its content cannot be edited
- Its workflow state cannot be changed
- It cannot be renamed or moved to another folder

Ownership can be **claimed** by another vault at any time. The owning vault can automatically or manually permit or deny such a transfer of ownership. Ownership can also be **forwarded** to another vault manually, or as part of a workflow.

### Document Transfer

To move updated document content between vaults, the updated documents are transferred. Transfers are always restricted to documents that have changed since the last transfer. Transferring an updated assembly implies transferring any updated components of the assembly.

Transfers can be *scheduled* to occur at preconfigured times or with preconfigured intervals, or can be *on-demand* task-based.

Documents will be organized in a Briefcase that is transferred and unpacked on the receiving end. Multiple transfer protocols like HTTP or FTP can be used.

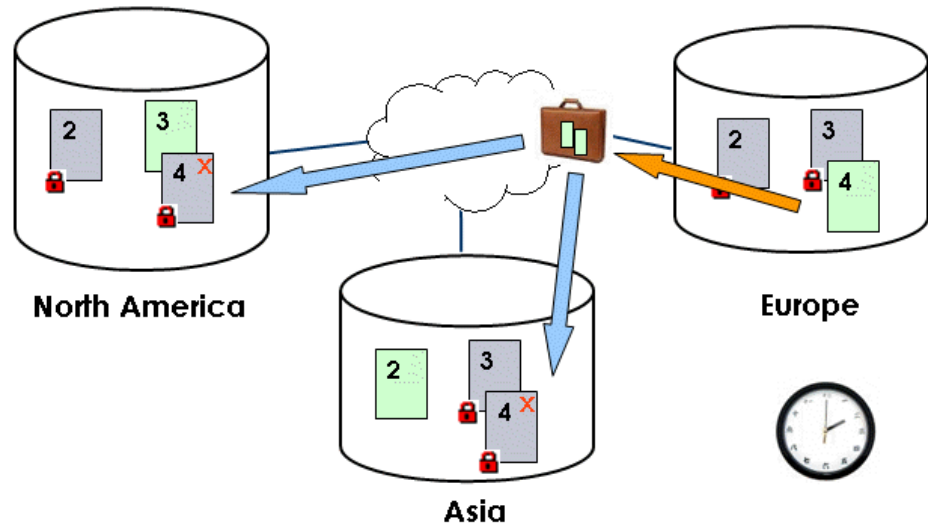
### Site Enlistment

When collaboration between multiple sites is required, vaults on the remote sites must be *enlisted* to work on the assembly. When a site is enlisted to co-operate on an assembly, the assembly (including components) is transferred to that vault. Future updates will also be transferred to the enlisted vaults.

Subject to configured restrictions, an enlisted vault will be able to initiate on-demand transfers and will be able to claim ownership of the shared documents.

### 3 Managing Engineering Content Globally

Once the collaboration vaults are configured at the sites the engineering teams can start working on a global basis. Engineering teams often work in project organizations to schedule and execute the engineering work. The following scenario shows how to create a global collaboration framework for a project organization.



#### Project Collaboration

Each document can have replicas on multiple sites. In this process, **engineers on multiple sites are collaborating in the design process**. Each site is working on different parts of the main assembly. Starting, designing and finishing will take place with the following steps:

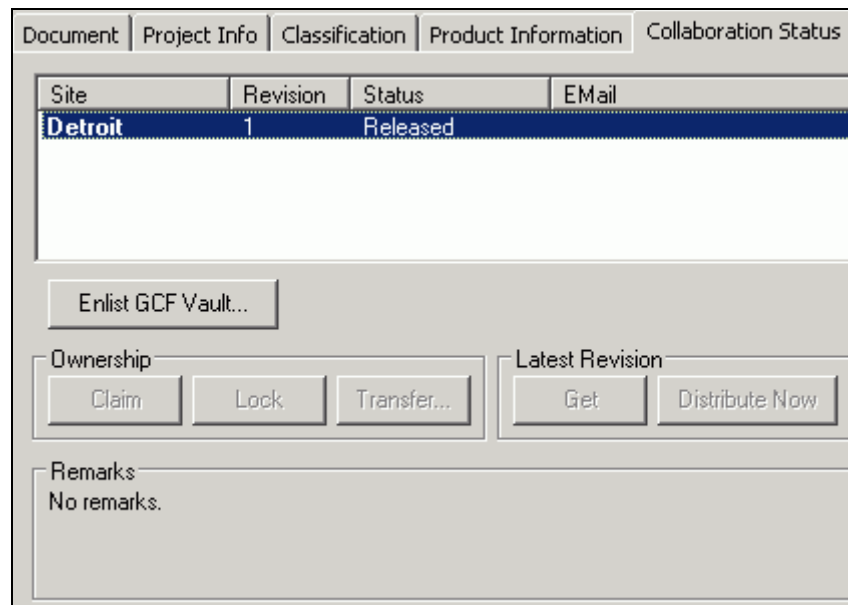
1. Project Start  
The main structure of a product or asset is created by the project leader at his local site. Once the structure is created engineers on the local site start working on it.
2. Enlist Site  
The project leader has the option to enlist resources of a remote site in the project. When a remote site is enlisted, the entire product or process structure is sent to the selected site. At this point, all the items in the structure are read-only on the remote site.
3. Scheduled Update (1)  
After a site has been enlisted, it will receive automatic updates. The update interval is configurable (e.g. every day, every hour etc.) and can be made dependent on metadata, e.g. the Document Type.
4. Remote Update  
When an engineer at an enlisted remote site needs to add an item or substructure, the engineer must also be able to change the containing structure. To do this, the remote engineer can claim ownership of the containing structure. When ownership is claimed, the containing structure becomes read-only on the originating site.
5. Scheduled Update (2)  
When changes are made on an enlisted remote site, then this site will send automatic updates to the other sites in the group as described in point 3.
6. On-demand Update  
If necessary, an engineer on any site can select a structure that is designed on another site, and request an immediate update on it. The remote site will then send its latest updates that will be processed at the requestor's site. After completion the requestor receives an email notification.
7. Completion  
At project completion, all engineers on the enlisted remote sites have to submit and release their work. The site of the project manager will then take ownership of all substructures and release the entire product or process structure.

## 4 Ease of Use

For usability purposes the GCF functionality is embedded in the standard user interface of power user clients and office user clients. This chapter describes the user interface which the GCF presents to the engineers.

### Collaboration Status

The collaboration status of a document is displayed and managed from the 'Collaboration Status' tab in the Power User:



In this tab, the following functions are provided:

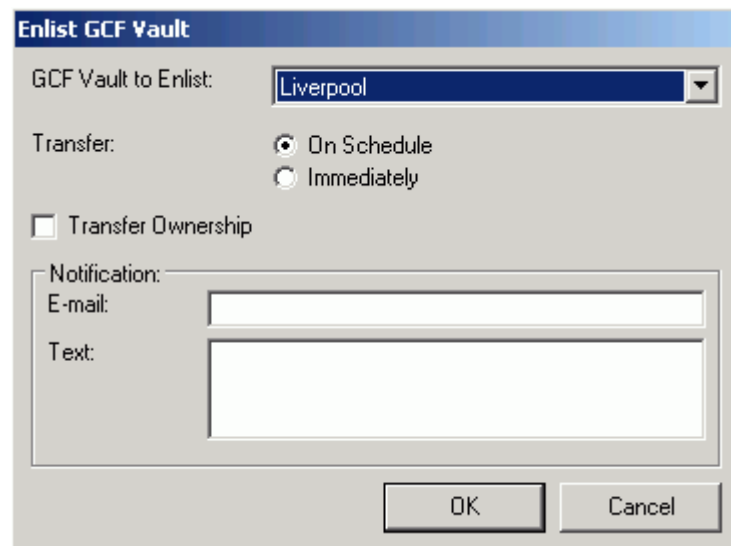
- In the list, the statuses of the document on the collaborating sites are reported.
  - The 'Site' column shows the logical names of the participating sites.
  - The 'Revision' column shows the revision number last reported by the remote site.
  - The 'Status' column shows the status of the document last reported by the remote site.
- The 'Enlist Site' button shows the 'Enlist Site' dialog (see section 4.2). It is available only to user having the privilege to enlist sites. Using this button requires the 'Enlist Vault' privilege.
- The 'Ownership' frame groups the actions available to manage ownership of the document.
  - When the document is currently owned by another site, the 'Claim' button is available. When the user clicks it, ownership will be claimed from the current owner. If the current owner refused to relinquish ownership, the user will see a message dialog. Using this button requires the 'Claim Ownership' privilege.
  - When the document is currently owned by the local site, the 'Lock' button is available. When the user clicks it, ownership claims from other sites will be refused with the reason 'Ownership locked by <user>'. When ownership for a document is locked, the caption of the button will be 'Unlock', and clicking it will unlock ownership. Using this button requires the 'Lock Ownership' privilege.
- The 'Latest revision' frame groups manual actions that can be taken to manage distribution of the latest revision.
  - When the document is currently owned by another site, the 'Get' button is available. When the user clicks it, the current owner will be instructed to transfer the latest revision immediately. If the document is a (sub-)assembly, updated components will also be transferred. The user can receive a

notification email when the transfer is complete. Using this button requires the 'Get Latest Revision' privilege.

- When the document is currently owned by the local site, the 'Distribute Now' button is available. When the user clicks it, a transfer to all collaborating vaults will be initiated immediately. Using this button requires the 'Distribute' privilege.

### Enlist Vault

Clicking the 'Enlist Vault' button in the 'Collaboration Status' tab shows the 'Enlist Vault' dialog:

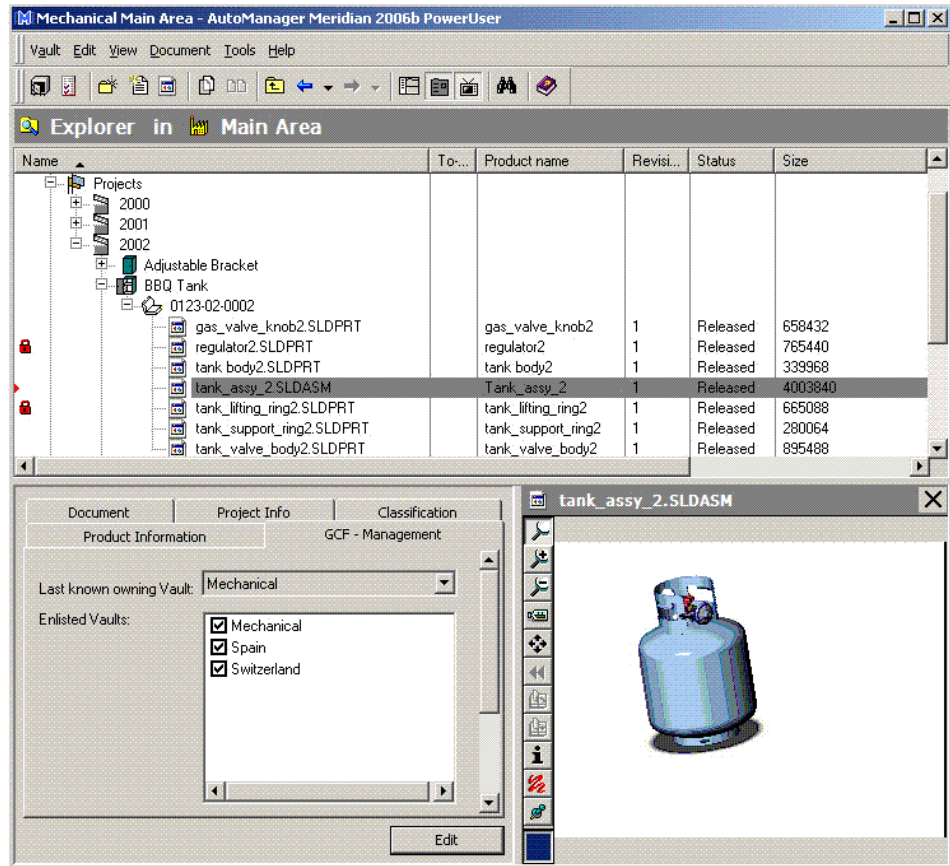


In this dialog, the following functions are provided:

- In the 'Vault to Enlist' dropdown list, the user can select the site to enlist from a preconfigured list.
- In the 'Notification email' field, the user can enter an email address to be notified when the initial transfer is complete.
- The user can select two transfer options:
  - When the user selects 'On schedule', the transfer is initiated on the next scheduled time.
  - When the user selects 'immediate', the transfer is initiated immediately.
- When the user selects the 'Transfer Ownership' option, ownership is transferred together with the initial transfer.

### Collaboration Status Management

The tab 'GCF – Management' can be used to correct the values in the internal properties that control the GCF. Correction may be necessary in special circumstances, such as reverting to a backup of the Vault or after a failure of the data communication links between sites.



- In the 'Last known owning Vault', the vault currently owning the document can be selected. It may be necessary to change this value after the vault has reverted to a backup.
- In the 'Enlisted Vaults' list, the enlisted Vaults can be set.
- In the 'Ownership Locked' field, the ownership can be locked or unlocked.
- Using this tab requires the 'Manage Collaboration' privilege.

## 5 GCF Configuration

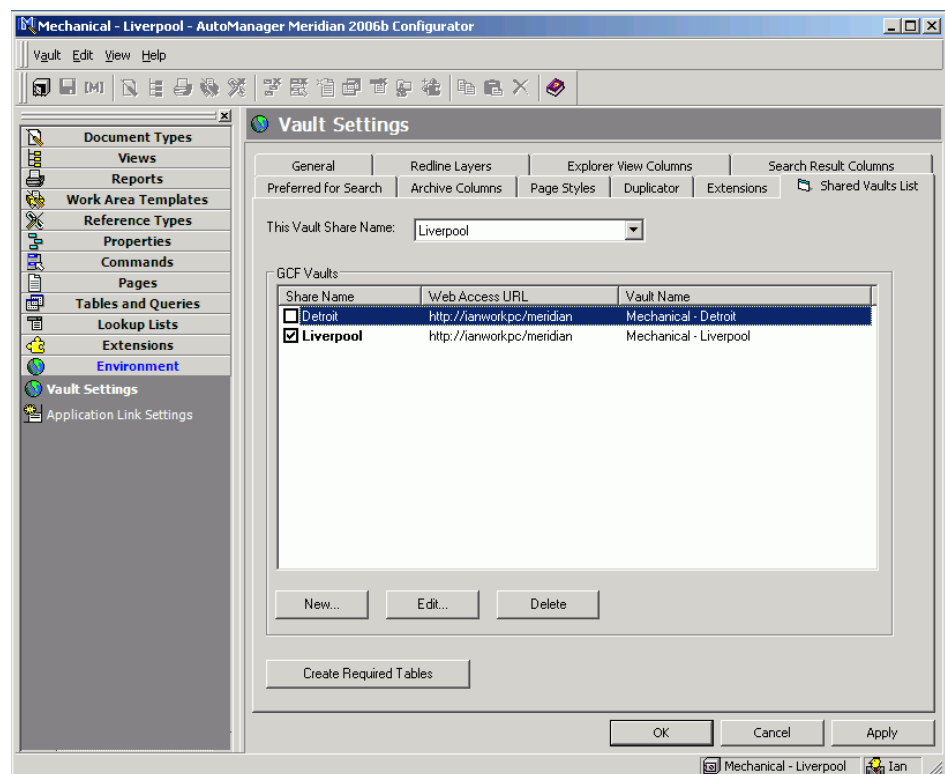
The configuration of GCF takes place in the InnoCielo Meridian Configurator. This chapter describes the configuration settings of the GCF.

### 5.1 Initial Setup

Per collaboration site, one GCF installation is required. The GCF installations communicate with each other using remote API calls to exchange engineering content and the InnoCielo Briefcase technology for actual data transfers. Standard transfer protocols like HTTP(S) and FTP(S) are used to transport documents to InnoCielo Briefcases and InnoCielo Work Areas.

#### Shared Vault List

The list of shared vaults is configured in the 'Shared Vaults' tab in the Configurator:



In this tab, the following functions are provided:

- In the list, the following information is shown for each shared vault:
  - The 'Share Name' column shows the name of the shared vault as presented in the user interface.
  - The 'Web Access URL' column shows the URL to web-access on the site of the vault.
  - The 'Vault Name' column shows the name of the vault at the remote site.
- When the user clicks the 'New' button, a new shared vault entry is created and the 'Shared Vault Details' dialog (see section 5.2) is shown.
- When the user clicks the 'Edit' button, the 'Shared Vault Details' dialog (see section 5.2) is shown for the selected entry.
- When the user clicks the 'Delete' button, the selected entry is deleted.
- In the 'Transfer Component' field, the ProgID of the ActiveX component that implements the file transfer must be entered.

## 5.2 Shared Vault Details

In the 'Shared Vault Details' dialog the properties for a shared vault entry can be set:

In this dialog, the following functions are provided:

- In the 'Share Name' field the name of the shared vault as presented in the user interface can be set.
- In the 'Web Access URL' field the URL to web-access on the site of the remote vault must be set.
- In the 'Transfer Address' field, information to control the transfer component can be entered.
- In the 'Username' and 'Password' fields the credentials to access the remote site must be entered.
- In the 'Vault Name' field the name of the vault at the remote site must be set.

### Privileges

The GCF adds new privileges to InnoCielo-Meridian:

- Enlist Vault  
This privilege is required to enlist a Vault.
- Lock Ownership  
This privilege is required to lock ownership.
- Claim Ownership  
This privilege is required to claim ownership.
- Get Latest Revision  
This privilege is required to use the 'Get Latest Revision' function.
- Distribute  
This privilege is required to use the 'Distribute Now' function.
- Manage Collaboration  
This privilege is required to use the 'GCF – Management' tab.
- Grant Reuse  
With this privilege, the user can grant re-use on a document of which he is not the owner.

## 6 Solution Benefits

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The GCF provides benefits for global engineering organizations that need to exchange engineering content across dispersed engineering teams. The GCF is beneficial in the following scenarios:

- Enable real-time concurrent engineering across the world
- Allow engineering content exchange with third party engineering contractors
- Establish a global collaborative project environment

The GCF provides the following additional benefits for end-users

- Allow concurrent engineering for virtual global projects.
- Availability of power clients and office clients in remote locations.
- Availability of integrations with CAD systems and Office tools
- Replication takes place on a need to know, need to share basis.

## 7 Customer Quote

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"InnoCielo Publisher is a useful extension to InnoCielo Meridian Enterprise which we currently use to manage about 280,000 technical documents. InnoCielo Publisher provides us with a standard approach to the high volume printing of our project documentation and integrates with our system to produce neutral PDF's for easy distribution," comments Alan Painter, business manager – secondary systems of AREVA T&D Systems, an industry leader in solutions for energy transmission and distribution. "With InnoCielo Meridian Enterprise at the front end, InnoCielo Publisher operates invisibly in the background and sends our publishing requirements to our servers in a wholly automated process, cutting out the need for manual, time-consuming effort."

## 8 Global Collaboration Framework vs. Publisher Framework

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The commonality of the GCF and the InnoCielo Publisher is that both InnoCielo modules have the possibility to transfer engineering content from one InnoCielo Meridian vault to another. The use cases of both modules however are completely different.

- The InnoCielo Publisher is typically used for sending released and rendered engineering content to another information management system, not necessarily an InnoCielo Meridian vault.
- The GCF is used for exchanging native engineering content between multiple InnoCielo Meridian environments. GCF is also capable of synchronizing non-released engineering content (as of GCF 2007).

## 9 Professional Services Offering

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Specific InnoCielo GCF requirements can be implemented by BlueCielo Professional Services or BlueCielo Certified Partner. The requirements analysis will determine what functionality can be provided out-of-the-box or with simple configuration, and what functionality can only be achieved by additional customization. The customer can then make an informed cost-benefit decision with respect to the degree of customization.

Subsequently, BlueCielo Professional Services or BlueCielo Certified Partner will configure and/or enhance the InnoCielo GCF to support custom features. For example in an existing situation with customized workflow in place, it may be necessary to amend this workflow for the 'insertion' of documents coming from other sites. Another example of possible customization is to configure specific file-transfer protocols and/or firewall settings.



Taking EDM to the Enterprise

## 10 BlueCielo ECM Solutions

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BlueCielo ECM Solutions (formerly Cyco Software) provides Engineering Content Management (ECM) solutions for multiple vertical industries, including utilities, oil & gas, petrochemical, pharmaceutical, government, transportation and process and discrete manufacturing. BlueCielo has over two decades of industry experience with more than 275,000 users in 50+ countries worldwide. The company has offices in the USA, UK, Russia, Germany, and The Netherlands and an extensive global network of established partners. BlueCielo ensures a high level of service and support on a truly worldwide scale for its leading software solutions InnoCielo Meridian Enterprise and InnoCielo Teamwork (formerly AutoManager Meridian and AutoManager TeamWork).

## 11 Questions?

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For further information on this subject or about BlueCielo, please feel free to contact us by phone, email [info@bluecieloecm.com](mailto:info@bluecieloecm.com) or visit our websites.

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