

IPS VideoAnalytics V13.0

Analytics Description

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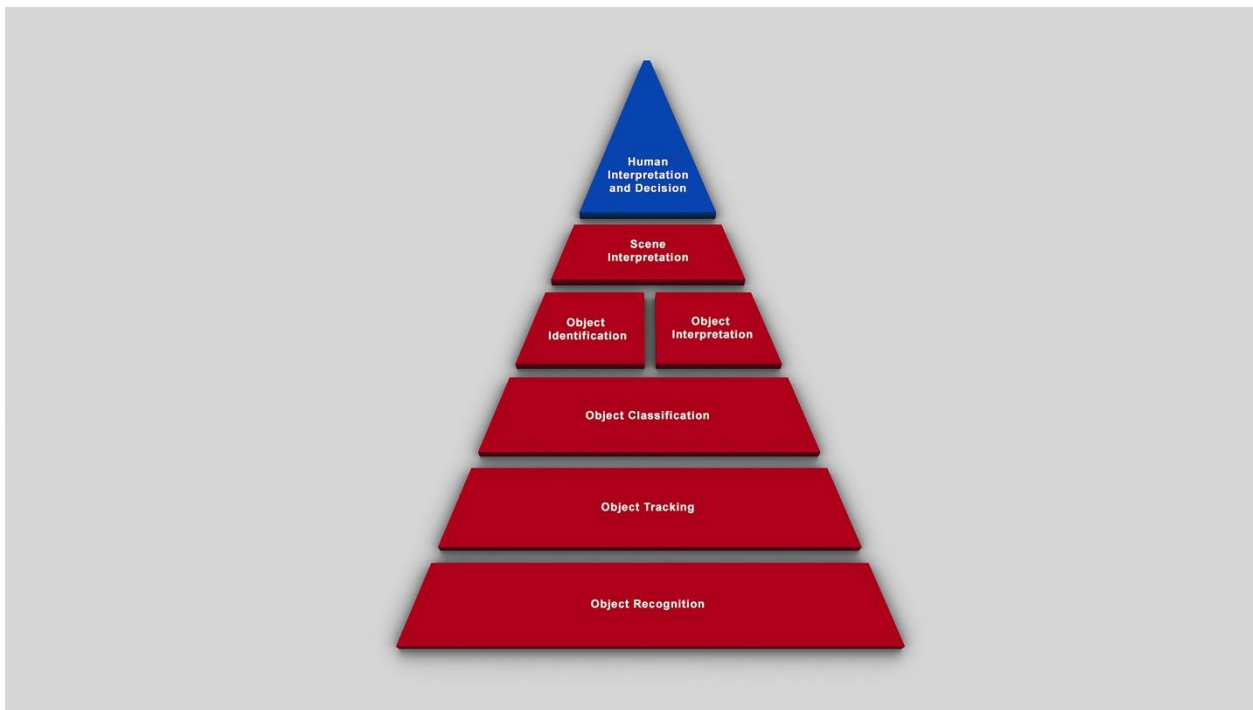
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IPS VideoAnalytics Analytics Description

IPS VideoAnalytics are intelligent, software-based analytics modules operated on servers or cameras for automatic detection of security related objects or events in video images. In real-time, they allow object recognition, object tracking, object classification, object identification, object interpretation and scene interpretation. This enables the support of security staff, the reduction of data volumes and the improvement of the effectiveness of video surveillance systems.

Technology – What are IPS VideoAnalytics?

IPS VideoAnalytics, also known as Intelligent VideoAnalytics or as Video Content Analysis, are software-based algorithms for automatic evaluation of digital images from video surveillance cameras, using various procedures to enable the detection of pre-defined objects and events. They also provide event data and metadata, and in combination with video management systems, they support the display of analytical results and the triggering of various actions such as providing alarm signals to security staff, controlling video recordings, searching through video sequences, switching I/O devices, etc.



At the current state of technology, IPS VideoAnalytics are using the following basic procedures for automated processing and evaluation of video images:

Object recognition

Object recognition detects changes within a video image, by analysing differences between the individual images in a series of images. This procedure is chiefly used to control the recording process so as to reduce the amounts of data, and is not designed for precise detection of security-related objects or events.

Object tracking

Object tracking serves to detect moving objects within a video image, by detecting objects in a video image and tracking them across a series of images. This procedure is particularly suitable for detection tasks in applications where there are few sources of disturbance (due to light, shadow, reflections, weather, crowds, etc.).

Object classification

Object classification permits differentiation between pre-defined types of objects (e.g. people, animals, vehicles, etc.) in a video image. The objects in a video image are analysed, classified based on defined characteristics, and tracked across a series of images. This procedure is suitable for detection tasks in applications with various sources of disturbances.

Object identification

Object identification provides the ability to recognise specific object properties (e.g. faces, people, license plates, etc.) in a video image. In this process, objects in a video image are analysed and identified based on pre-defined characteristics. This procedure is only suitable for use in specific conditions and for special applications.

Object interpretation

Object interpretation allows specific object states to be detected in a video image (e.g. behaviour, number, etc.). To this end, objects in a video image are analysed and their status is interpreted based on pre-defined criteria. This procedure, like object identification, is only suitable for use in specific conditions and for special applications.

Scene interpretation

Scene interpretation lays the foundations for analysing specific areas in a video image in different ways. For this purpose, the corresponding areas of the image are marked (e.g. fence, facade, artworks, platform, track bed, etc.) and analysed according to the desired priority and function. This procedure is designed for adapting the analytics module to deal with specific application scenarios.

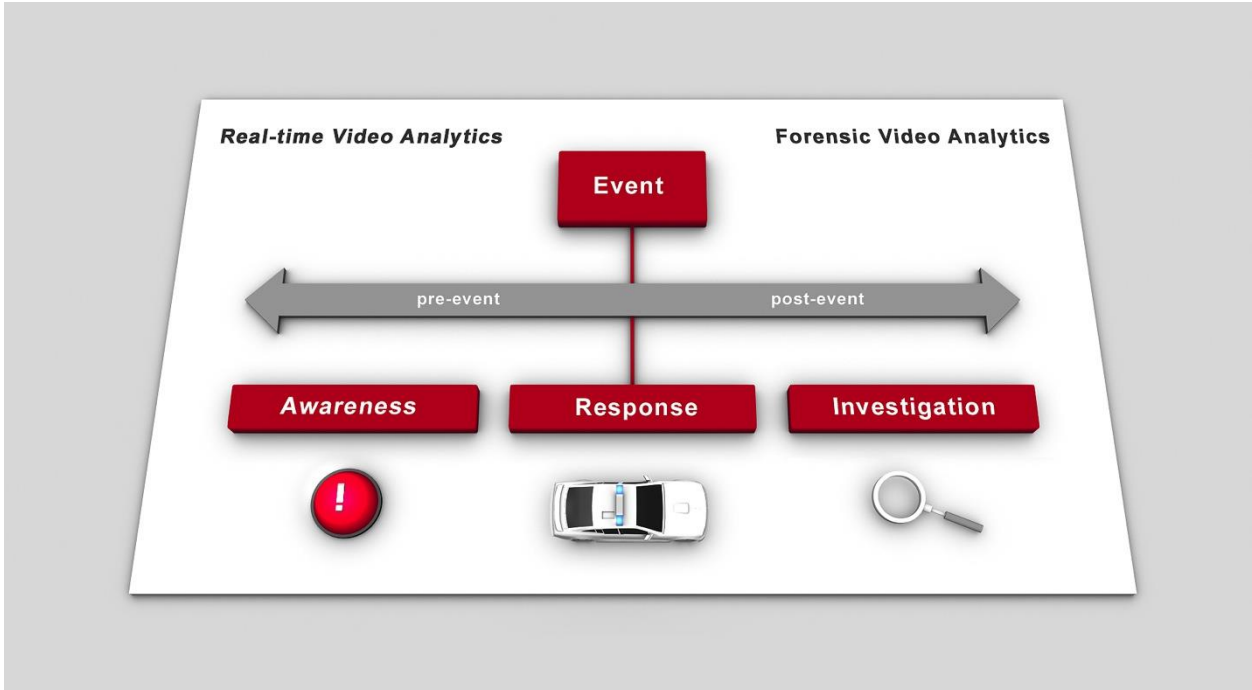
Human interpretation and decision

In addition to these basic procedures, there are many other methods for automated processing and analysis of video images, such as image comparison, image pixelation etc. All these various procedures are designed to support human beings, but they cannot replace them. Therefore human interpretation of the analysis results is always necessary in every case. Moreover, if an event occurs, the necessary measures will only be initiated after verification by trained users.

Operation – How are IPS VideoAnalytics used?

IPS VideoAnalytics are used both for real-time analysis of events in video images (Real-time VideoAnalytics) and for retrospective analysis of events in recorded video sequences (Forensic VideoAnalytics). Real-time VideoAnalytics provides automatic information to security staff and allows the immediate initiation of necessary measures whilst an event is occurring. By comparison, Forensic VideoAnalytics permits automatic analysis after an event of recorded video data, for retrospective investigations carried out by security staff.

Note: Forensic VideoAnalytics are currently available only on the VideoManager platform.

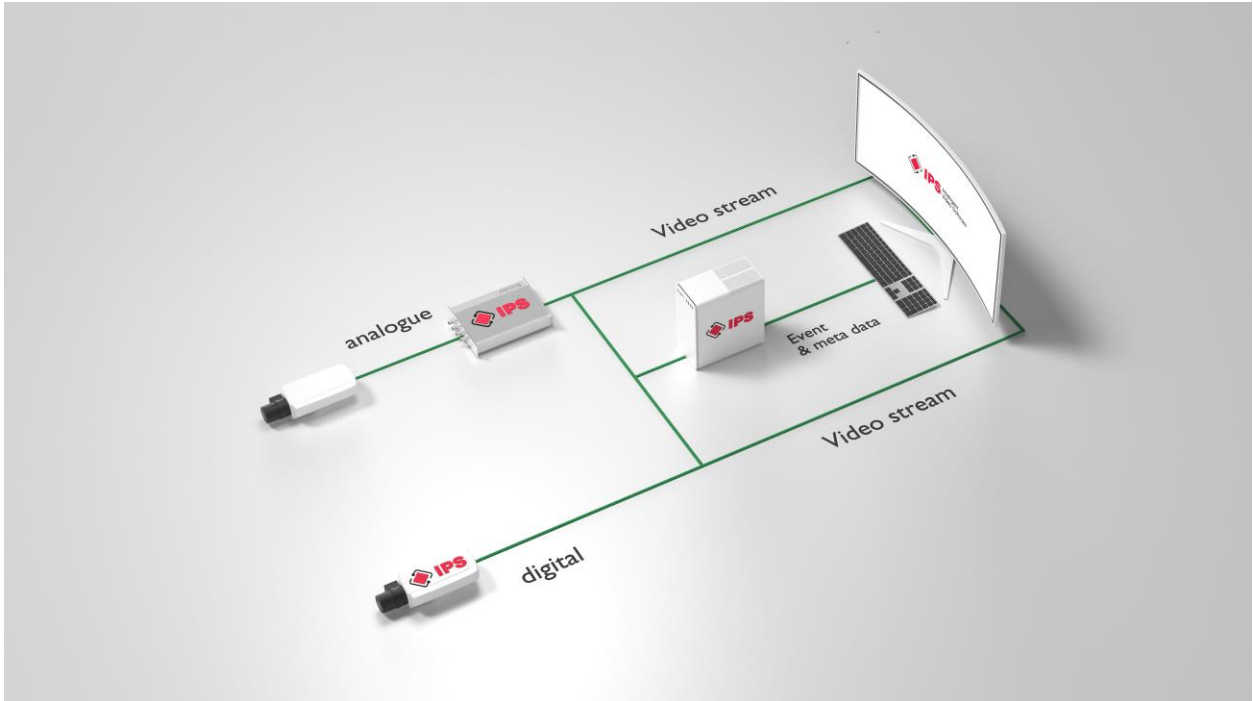


Which of these two operational modes to use in a specific application should be assessed based on the tasks to be carried out in the individual case:

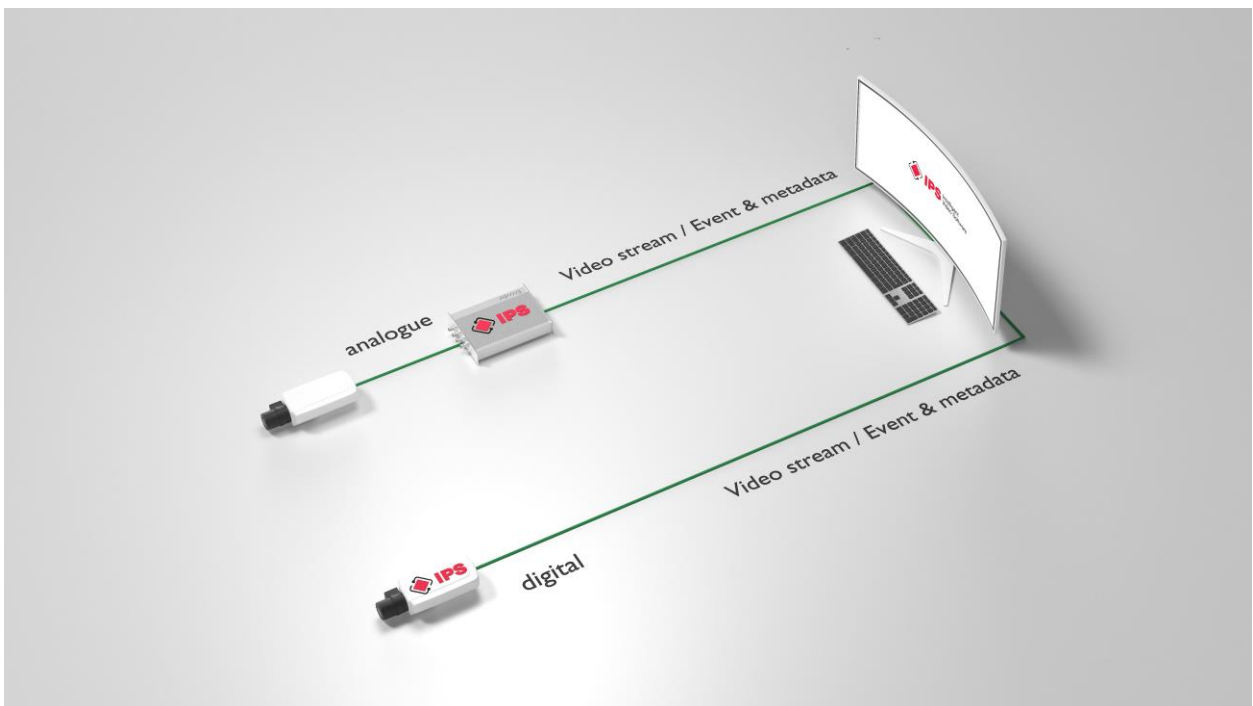
	Tasks
Real-time VideoAnalytics	<ul style="list-style-type: none"> • Warning information in real-time before and during the event • Manual/semi-automatic searching of recorded events • Unique configuration depending on the scene under surveillance • Reduced bandwidth and storage required • Easy integration in video management system
Forensic VideoAnalytics	<ul style="list-style-type: none"> • Investigative information following an event • Automatic searching of recorded events • Multiple configurations depending on the aim of the investigation • Increased bandwidth and storage required • Comprehensive integration in video management system

Architecture – Where are IPS VideoAnalytics used?

Because of the computing power that is required, IPS VideoAnalytics will usually be implemented on centralised PCs and servers (server-based VideoAnalytics). However, given the increasing performance capability of processors, it has recently become possible to implement them in distributed systems in video cameras and video encoders (camera-based VideoAnalytics).



Server-based VideoAnalytics



Camera-based VideoAnalytics

Which of these two operational architectures is the correct one for a specific application should be assessed based on their advantages and disadvantages in each case:

	Pros	Cons
Server-based VideoAnalytics	<ul style="list-style-type: none"> • Independent of camera supplier • Independent of camera model • More computing power • Central software installation and maintenance 	<ul style="list-style-type: none"> • More bandwidth needs • More server needs • Restricted use of intelligent cameras • Restricted system scaling
Camera-based VideoAnalytics	<ul style="list-style-type: none"> • Less bandwidth needs • Less server needs • Unrestricted use of intelligent cameras • Unrestricted system scaling 	<ul style="list-style-type: none"> • Dependent on camera supplier • Dependent on camera model • Less computing power • Distributed software installation and maintenance

Applications – When will IPS VideoAnalytics be used?

IPS VideoAnalytics will be used increasingly for a wide variety of small, medium, and large applications in a range of sectors. The increase in video surveillance means that the monitoring, analysis and recording of video images will involve ever more staff and generate ever more data, and thus it will also become a bigger cost item. At the same time, scientific studies show that the attention of security staff when monitoring screen images drops off significantly after a short time, so that security-related incidents can no longer be detected in a timely manner.

IPS VideoAnalytics are therefore a preferred solution to improve the long-term effectiveness of video surveillance systems. In this context, however, it should be noted that there can be no “one-size-fits-all” solutions – because of the varying requirements, the algorithms used must be specially designed and optimised for each application, otherwise it will be difficult to achieve the expected results. Although there are various system-suppliers who may be able to handle various applications at the same time with an analytics module using a rule-based design, it has been shown in practice – outside of laboratory conditions – that application-based designs consistently deliver better results.



Typical applications of IPS VideoAnalytics include:

- Area monitoring for control of recording
- Camera monitoring to prevent attempts at tampering
- Room, perimeter and grounds security against break-ins and break-outs
- Detection of loitering and suspicious behaviour
- Protection of privacy in public and private monitoring areas
- Preventive detection of suspicious objects
- Securing critical infrastructure against attacks
- etc.

Advantages – Why IPS VideoAnalytics offer clear competitive advantages?

IPS VideoAnalytics provide the following performance characteristics:

Comprehensive solutions based on experience since 1965

IPS VideoAnalytics and their patented procedures are the results of about 50 years of experience in the design, development, and operation of analytics modules in countless video surveillance installations. The current portfolio offers comprehensive solutions for demanding applications and meets the highest requirements for quality. This includes, among others, the British Home Office's internationally renowned iLIDS Certification for IPS Outdoor Detection and IPS Intrusion Detection (Axis) as a Primary Detection System for use in critical infrastructure.

Ultra reliability through the “One App” approach

IPS VideoAnalytics are designed for specific application scenarios. Thus, every analytics module has special additional knowledge relating to its specific application. This increased level of information means that scarcely any special knowledge is needed to configure the module and that right from the start it operates in a significantly more stable manner, with less or even no need for subsequent optimisation. In addition, this application-oriented approach to correct project design, installation and configuration leads to a very high probability of detection and ultra-low false alarm rate, even under difficult environmental conditions.

Open interfaces for integration of event data and meta data

IPS VideoAnalytics provide open interfaces for integration in video management systems. In the interaction between analytics module and video management system – depending on the level of integration – the processed analysis results, as event data and meta data, can be displayed in real-time and/or used for retrospective searches.

Unlimited availability on servers and intelligent cameras

IPS VideoAnalytics were originally developed for operation on servers integrated in IPS VideoManager and other video management systems. For some time now, however, a growing number of analytics modules is available on Axis ACAP enabled cameras and encoders, without any limitations on their performance.

Intuitive setup thanks to extended usability

IPS VideoAnalytics are equipped with a graphical user interface for intuitive setup of individual analytics modules. The desired applications can be easily configured with only a few mouse clicks and require no special additional knowledge – thus avoiding possible configuration errors and minimising the need for expensive re-configuration with the associated extra costs.

Portfolio – Which IPS VideoAnalytics are currently available?

In the current version of IPS VideoAnalytics are the following analytics modules available:

IPS VideoAnalytics (server-based)

IPS VideoAnalytics (server-based) are intelligent analytics modules for real-time detection of security related objects or events integrated in IPS VideoManager or compatible third-party video management systems. They are easy to install with its multi plugin architecture on servers and to configure with a client of the video management system. This facilitates the operation of one or more analytics modules per camera. In addition, they provide the transmission of event data and the display of meta data within video management systems.

IPS Intrusion Detection	IPS Intrusion Detection is an intelligent video analytics module for real-time alerting in case of intrusion into secured outdoor areas.
IPS Indoor Detection	IPS Indoor Detection is an intelligent video analytics module for real-time alerting in case of intrusion into secured indoor areas.
IPS Motion Detection	IPS Motion Detection is an intelligent video analytics module for real-time alerting in case of moving objects within predefined areas.
IPS Sabotage Detection	IPS Sabotage Detection is an intelligent video analytics module for real-time alerting in case of camera tampering attempts (covering, redirecting, spraying, blinding).
IPS Loitering Detection	IPS Loitering Detection is an intelligent video analytics module for real-time alerting in case of loitering in monitored areas.
IPS Tamper Detection	IPS Tamper Detection is an intelligent video analytics module for real-time alerting in case of camera tampering attempts in critical infrastructures (defocusing, misting, concealing, covering, redirecting, spraying, blinding).
IPS Privacy Protection	IPS Privacy Protection is an intelligent video analytics module for real-time protection of privacy in monitored areas.
IPS Dome Tracker	IPS Dome Tracker is an intelligent video analytics module for real-time control of PTZ cameras.
IPS Public Transport Protection	IPS Public Transport Protection is an intelligent video analytics module for real-time alerting in case of potential emergencies in underground or overground railway installations.
IPS Left Luggage Detection	IPS Left Luggage Detection is an intelligent video analytics module for real-time alerting in case of suspicious luggage in monitored indoor areas.
IPS Outdoor Detection	IPS Outdoor Detection is an iLiDS certified video analytics module for real-time alerting in case of intrusion into secured outdoor areas.
IPS Activity Detection	IPS Motion Detection is an intelligent video analytics module for real-time alerting in case of moving objects within predefined areas.
IPS Critical Infrastructure Protection	IPS Critical Infrastructure Protection is an intelligent video analytics module for the real-time alerting in case of intrusion into secured outdoor areas of especially sensitive installations.
IPS NextGen VideoAnalytics	IPS NextGen VideoAnalytics is an intelligent video analytics module, which includes the following functions executed in real time: <ul style="list-style-type: none"> • Alerting of intrusion into secured outdoor areas • Privacy protection • Alerting of loitering.

IPS VideoAnalytics (camera-based)

IPS VideoAnalytics (camera-based) are intelligent analytics modules for real-time detection of security related objects or events integrated in Axis cameras or encoders. They are easy to install on the Axis ACAP platform and to configure with a web browser. This facilitates the operation of one analytics module per camera. In addition, they provide the transmission of event data and the display of metadata within a web browser as well as within video management systems.

IPS Intrusion Detection (camera-based)	IPS Intrusion Detection (camera-based) for Axis ACAP enabled cameras and encoders is an intelligent video analytics module for real-time alerting in case of intrusion into secured outdoor areas.
IPS Indoor Detection (camera-based)	IPS Indoor Detection (camera-based) for Axis ACAP enabled cameras and encoders is an intelligent video analytics module for real-time alerting in case of intrusion into secured indoor areas.
IPS Motion Detection (camera-based)	IPS Motion Detection (camera-based) for Axis ACAP enabled cameras and encoders is an intelligent video analytics module for real-time alerting in case of moving objects within predefined areas.
IPS Sabotage Detection (camera-based)	IPS Sabotage Detection (camera-based) for Axis ACAP enabled cameras and encoders is an intelligent video analytics module for real-time alerting in case of camera tampering attempts (covering, redirecting, spraying, blinding).
IPS Loitering Detection (camera-based)	IPS Loitering Detection (camera-based) for Axis ACAP enabled cameras and encoders is an intelligent video analytics module for real-time alerting in case of loitering in monitored areas.

Availability of IPS VideoAnalytics on the different Platforms

VideoAnalytics	IPS VideoManager	Axis ACAP cameras
IPS Intrusion Detection	yes	no
IPS Indoor Detection	yes	no
IPS Motion Detection	yes	no
IPS Sabotage Detection	yes	no
IPS Loitering Detection	yes	no
IPS Tamper Detection	yes	no
IPS Privacy Protection	yes	no
IPS Public Transport Protection	yes	no
IPS Dome Tracker	yes	no
IPS Left Luggage Detection 1)	yes	no
IPS Outdoor Detection	yes	no
IPS Activity Detection	yes	no
IPS Critical Infrastructure Protection	yes	no
IPS NextGen VideoAnalytics	yes	no
IPS Intrusion Detection (camera-based)	no	yes
IPS Indoor Detection (camera-based)	no	yes
IPS Motion Detection (camera-based)	no	yes
IPS Sabotage Detection (camera-based)	no	yes
IPS Loitering Detection (camera-based)	no	yes

1) Not available in Germany

Additional documents

- Current interface descriptions
- Current planning, installation, configuration, commissioning and operating instructions