

PTV Axylog

Service description

Short title	Service Description PTV Axylog
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1 Product objective

PTV Axylog is a cloud-based product to gain transparency and control of the logistics transport chain.

The set of modules and functions and the collaboration between the different stakeholders involved provides end-to-end visibility along the transport chain. PTV Axylog is able, to acquire all information and data generated along the transport chain and makes it available and transparent to all stakeholders.

Stakeholders can be Shippers, hauliers, transport service providers, fleet operators, planners, dispatchers, drivers, consignees (e.g., warehouse operators) and consigners. The use of PTV Axylog by a dedicated stakeholder depends on the rights and roles which were permitted.

Different delivery structures such as LTL, FTL, parcel delivery and last mile delivery can be supported by PTV Axylog depending on the use cases of different target groups (e.g., retailers, wholesalers, production industries and logistics service providers).

PTV Axylog consists of the central cloud based PTV Axylog Portal and the supplementary mobile PTV Axylog App, which makes it possible to provide electronic Proof of Delivery (PoD) by using mobile devices. Robust interfaces (API) allow to connect to external systems. Simple connectivity to telematics services provides real time transport visibility based on actual vehicle positions. The add-on Document Management enables the digitization of documents (e.g., transport documents, waybills), and offers the option of capturing digital signatures via the mobile PTV Axylog App.

PTV Axylog supports connectivity to PTV Route Optimiser ST (version 2022 or newer) and PTV Route Optimiser CL. Planned routes can be imported and adopted for the transport execution in PTV Axylog. The entire transport execution, monitoring and reporting workflow can be covered by PTV Axylog.

PTV Axylog can also be used as “stand-alone product”. Data exchange with leading systems such as ERP or TMS can be provided through API- or (s)FTP connectivity.

2 Product description

2.1 Product scope

PTV Axylog is available at portal.axylog.com. After logging in, the product shows various metrics to measure the status of activities based on the product packages which were subscribed.

The available scope of functions is listed below:

- Delivery Tracker
- Delivery Management
- User Management
- Registry
- QrDocuments
- Chat
- Chat management
- System
- Logs & Monitor
- Statistics

The scope of displayed and usable functions depends on the subscribed product packages and add-ons.

Delivery Tracker

allows the visualization of pick-up and delivery orders in two modes, by trip and by grid. In trip mode, deliveries are grouped by shipment ID and can be associated with a vehicle or a driver. In trip mode it is possible to view the list of deliveries associated with it and to open the detail view for each of them. In the header of each trip, coloured segments are shown. Each segment corresponds to a delivery or a pick-up. At the end of each segment an arrow is shown, downwards for deliveries and upwards for pick-ups. The colours of the segments and arrows represent the status of each delivery or pick-up.

For each trip it is possible to view the starting point and the destination on the map. If the telematics interfaces are configured it is possible to follow the vehicle along the actual route driven to determine the arrival times. If a trip is started in the PTV Axylog App by a driver, additional data will be displayed in the Delivery Tracker such as the outcome of a delivery, delivery reasons, photos, signatures, and coordinates. The received data can initiate status changes of orders.

In table view, orders are listed according to filter settings and sorting which were applied by the user. The visibility of table columns can be customized by the user. A coloured line is shown on the left side of the table which represents the status of each single order. The displayed data can be exported in Excel- or PDF format.

Delivery Management

contains the functions that are used to control and manage trips. The Trip Maintenance function allows the user to change trip data such as license plate, carrier, driver, and departure date and delivery time window. The order sequence within one trip can be changed as well. The Bordereau function allows you to view the lists of trips which were assigned to a driver. It allows the user to check the trip status (e.g., if a driver has loaded or started a trip in the mobile PTV Axylog App).

User Management

Provides the administration of PTV Axylog Portal users and PTV Axylog App users. It is possible to add personal data for the users of the PTV Axylog App (normally corresponding to drivers) by entering the cell phone number, family name and surname. If the chat module is active further parameters are shown and can be configured. Users and roles allow to manage the permissions of each single user, including the available scope of the chat.

Registry

contains all personal data of partners connected to the context. Five different types of partners are available: Depots, Carriers, Customers, Suppliers and Shippers. The personal data can be created, modified, deleted and exported. In addition to the administration of personal data, further data can be managed to setup and configure specific modules and functionality in the best possible way.

QrDocuments

is available if the Document Management add-on is subscribed. It is possible to view and manage documents which are linked to orders. Managed documents can be in one of the following states: Original, digitally signed, scanned. QrDocuments provides the following views: Archive, Management, Upload. Archive enables the user to select and manually upload available documents by defining a filter criterion such as unsigned or not yet scanned. The user can also attach PDF documents to an existing order directly. It is possible to export selected data in Excel- and PDF-format. Management allows the user to manage received documents for which barcode scanning (OCR) has not yet been performed. Upload enables the user to manually attach a scanned PDF-document to a specific order. The Document Management add-on includes functionality to apply a PoD-signature which was acquired through the PTV Mobile App into the original PDF.

Chat

is an internal communication system which allows to communicate with other users of a PTV Axylog context for which the functionality has been activated. It is possible to communicate between PTV Axylog portal users (typically planners) and users of the mobile PTV Axylog app (typically drivers). Conversations and attachments can be linked to orders. Those conversations are shown in the Chat but also in the Delivery Details. This feature aggregates all the information and messages related to an order at one single place. Chat includes the ability to send messages, documents, and images.

Chat management

Allows the user to create user groups and to administrate permissions on user level.

System

Includes the basic settings which can be configured by PTV Axylog portal users such as Alert Template, Alert Workflow, Dashboard Configuration, POD Reasons, GPS Telematics Configurations and Report Designer.

With Alert Template it is possible to create a draft of the messages triggered by a specific event. Events and conditions (e.g., from 30 min delay) which trigger an alert can be defined in the Alert Workflow. Dashboard Configuration is used to associate dashboards to a company, to individual users or to users with a specific role. POD Reasons can be defined under respect of a specific PoD outcome of an order which is in fulfillment. With GPS Telematics Configuration it is possible to configure telematic systems under respect of the associated carriers. This functionality is only available if at least Package 1 – Transport Control Tower has been subscribed. Report Designer can be used to customize available reports.

Logs & Monitor

Monitors and records the status of each transaction and highlights incidents which were detected. Incidents can occur in various categories such as data communication and data processing.

Statistics

Provides dashboards and reports which include various metrics and KPIs. Based on the packages that have been subscribed, the user has predefined dashboards available to perform specific analyses.

2.2 PTV Axylog Portal

2.2.1 Basic functionality

API integration

All portal features are exposed via RESTful HTTP-services. The usage is regulated by an authentication system which takes user roles into account.

User management

In the PTV Axylog Portal the subscription admin (main user) has the permission to create and activate authorized users, manage their roles and permissions to use PTV Axylog services.

The context administrator user can create and manage all users of the context. In addition to the internal users, it is possible to invite and then create users for external companies which are connected to the context (e.g., carriers). The number of users which can be created is technically unlimited, except as specified in the contract.

App user management

Management of users which are authorized to use the mobile application. It is possible to define surname, name and cell phone number. The telephone number is unique, it is not possible to assign multiple users to the same cell phone number.

Master data

Personal and operational data of all stakeholders which are involved in the delivery process can be administrated. The main types are Warehouses, Carriers, Customers and Suppliers. It is possible to create sub-types for each main type (e.g. Transit Points for Warehouses).

Alert management (notifications workflows)

Templates for alerts and notifications can be created in HTML format (hereinafter referred to as messages). Such messages can be sent when a particular event occurs. The templates can either be private or public. Public templates are visible to all users of the PTV Axylog platform while private templates are only visible to the users of the PTV Axylog context in which the template was created.

By creating a workflow, it is defined when and how messages are sent. Messages can be sent via e-mail or SMS. In addition, webhooks can be triggered to call a web service. Workflows can be fully automatized and parameterized by admin users of the PTV Axylog context. Specific events that trigger an alert can be selected from predefined list.

System tables and parameters

Several system tables contain data such as Labels, PoD Reasons, Dashboards and Media Types. All tables can be managed by the context users. The parameters section includes General Parameters and External Partner Parameters. General Parameters are defined for the complete PTV Axylog context. External Partner Parameters can be specified for each external company (e.g., carrier A must acquire satellite positions, carrier B must not).

Logs

All errors that occur during a service call are logged. Logging takes place when queuing incoming data to be processed and analyzing incoming data before it is written into productive tables.

2.2.2 Package 1 - Proof of Delivery

The Proof of Delivery package includes the specific functions described below that are available in the PTV Axylog Portal if Package 1 – Proof of Delivery has been subscribed.

Deliveries

The Delivery Dashboard shows order data in grid format. An icon on the left side of the window is shown for each order. Each icon consists of a line and an arrow. The colour code of the line (green, yellow, or red) indicates the punctuality of an order. Arrows pointing upward represent pickups, arrows pointing downward stand for deliveries. The colour codes of the arrows (green, yellow, red) indicate if an order was fulfilled as planned (in full), if incidents occurred or if an order could not be fulfilled at all. The columns which are shown in the grid can be configured by the user.

Data which is shown in the grid can be exported in Excel- or PDF-format with a limitation of 5,000 rows per export. It's possible to show deliveries on the map with a limitation of 500 pins.

Trips

According to the filters defined by the user, the related deliveries can be shown in an aggregated way. A trip can be linked to the driver to whom it was assigned. For privacy reasons, the name of the driver can be hidden for the portal users of the PTV Axylog context. The name of the driver is always visible to the users of the carrier to which the driver is assigned. In Trip view the user can see all stops and the planned route on the map.

Positions and ETA calculation

In Package 1 - Proof of Delivery, the PTV Axylog App gets connected with the PTV Axylog portal to perform electronic Proof of Delivery with a mobile Android or Apple device.

An internal thread in the PTV Axylog App continuously acquires the position, either using GPS or WIFI cells. Thereby PTV Axylog gets technically enabled to use the most recent position at any time without slowing down the workflow efficiency of the driver.

The PTV Axylog App is technically capable of sharing a single event-based GPS position with the PTV Axylog Portal, when one of the following events occurs: Driver completes loading at depot, driver clicks on Start button, driver clicks on Arrived button, driver completes Proof of Delivery, driver confirms (click on button) to send the actual GPS position, if he is asked by a PTV Axylog portal user to do so.

The user of the PTV Axylog App can restrict or stop the sharing of GPS positions at any time, depending on the personal setting on the mobile device.

Single event-based GPS positions can be visualized in the map of the PTV Axylog Portal. With each new position received, PTV Axylog gets enabled to recalculate the Estimated Time of Arrival (ETA) for the next order and all subsequent orders of a trip in execution. Invalid data are not used for ETA calculation.

Live tracking of orders (arrival board website)

It is possible to send a message which is related to a dedicated order via email or SMS* to consignees and consignors. The message can include a dynamic link which can be clicked by the recipient of the message to open a PTV Axylog arrival board website. The website shows the Estimated Time of Arrival in real-time. The information on the website is automatically updated with each event which was triggered by the PTV Axylog App (initiated by the driver).

* To be able to send SMS, external provider data and credentials can be used by PTV Axylog. PTV Axylog does not include its own SMS service.

Alerts and notifications

Alert and notification workflows can be defined in the PTV Axylog Portal. Package 1 - Proof of Delivery includes the functionality to send alerts via e-mail and SMS*.

* To be able to send SMS, external provider data and credentials can be used by PTV Axylog. PTV Axylog does not include its own SMS service.

Chat

If chat functionality is enabled, PTV Axylog Portal users can exchange messages with other users in direct or in group chat. Authorized drivers can use the chat functionality via the mobile PTV Axylog app. All users can send text messages, attach documents and images. It is possible to either chat with users and user groups or to use the order-related chat which automatically attaches text and attachments to one single order. The order-related chat enables efficient communication between planners (via the PTV Axylog Portal) and drivers (via the PTV Axylog App).

KPI & Dashboard

Pre-defined graphical BI-dashboards enable the user to keep updated about the performance and status of trips, orders, and drivers in execution.

2.2.3 Package 2 – Transport Control Tower

The Transport Control Tower package includes the specific functions described below that are available in the PTV Axylog Portal if Package 2 – Transport Control Tower has been subscribed.

Telematics system management

Internal and external carriers can configure and administer their telematics systems to get connected with the PTV Axylog Transport Control Tower. Based on this connectivity PTV Axylog receives and processes vehicle movement data (GPS). If required, the PTV Axylog support can assist to do the configuration correctly.

Deliveries

The basic functionality and visualization of the Transport Control Tower correspond to the above-mentioned description of **Package 1 – Proof of Delivery**.

In addition, automatic detection of arrival, departure, rests and breaks and relative positions can be performed. Geofencing uses the transmitted positions which are provided by the telematics providers. The resulting data is stored and can be shown on the map. The calculations can be performed without any interaction of the driver which delivers robust results.

Trips

Each trip can be assigned to a vehicle by defining the license plate number of the tractor or trailer. An icon represents the connectivity status of the telematics provider for each single trip. If any issues occur (e.g., GPS data cannot be acquired, coordinates are inconsistent) the colour of the icon is either grey, blue or red. Grey colour: Telematics system not available, blue colour: Tracking is active, but no position is acquired (e.g., wrong license plate was assigned), red colour: Inconsistent data was received (e.g., position is outdated).

Positions and ETA calculation

Vehicle positions can be acquired continuously by telematics providers connected to the Transport Control Tower. Normally, the positions (GPS coordinates) are transmitted by telematics hardware devices (e.g., OBU, ELD) which are permanently installed inside the vehicles. Therefore, real time positions can be acquired and processed continuously with a high level of robustness.

The frequency with which positions are acquired and processed can be parameterized in cycles of 60 seconds. With each new position received, the system can update the Estimated Time of Arrival for the upcoming and the subsequent orders of one single trip in execution. If address or position data cannot be geocoded, ETA calculation is not performed. If positions from telematics providers cannot be acquired, the Transport Control Tower always uses the last valid position which was received.

If positions are received from both, tractor, and trailer, only the trailer positions are processed and persisted, as the tractor can be changed while a trip is in execution.

There can be exceptions where a telematics provider does not exclusively use telematics hardware but provides a mobile app solution. The Transport Control Tower processes these positions in the same way as data generated by telematics hardware. However, there may be limitations in data accuracy and robustness which can impact ETA calculation and live tracking.

If Package 1 - Proof of Delivery and Package 2 – Transport Control Tower have been subscribed, it is possible to continuously acquire positions from the mobile PTV Axylog App. This functionality must be explicitly activated in PTV Axylog. Then, the PTV Axylog App can be used to obtain position data during the execution of a trip. Potential limitations regarding data accuracy and robustness in comparison with data which is created by telematics hardware can occur.

By default, single event-based GPS positions can be sent from the PTV Axylog App to the PTV Axylog Portal with the same behaviour like described in “2.2.2 Specific functionality Package 1 - Proof of Delivery, Position for ETA calculation”.

In addition, continuous GPS positions can be sent from the PTV Axylog App to the PTV Axylog Portal. If this functionality is activated in the PTV Axylog product context, it applies by default to all app users that receive planned trip and order data from the PTV Axylog portal of this dedicated context. If required, the afore mentioned functionality and the related tracking can be deactivated for single PTV Axylog App users (typically drivers). The PTV Axylog App only shares the actual position with the PTV Axylog Portal, while a planned trip is in execution. The continuous sharing of positions starts at the earliest when a trip is started by the user of the PTV Axylog App and ends at the latest when the user of the PTV Axylog App ends a trip in execution.

The user of the PTV Axylog App can restrict or stop the sharing of GPS positions at any time, depending on the personal setting on the mobile device.

Position data which was received either from the PTV Axylog App or from any telematics provider are both handled in the same way. If continuous positions are exclusively acquired from the PTV Axylog App, the PTV Axylog Portal provides ETA calculation, tracking and tracing and plan actual comparison. If continuous positions are acquired from telematics providers, automatic detection of arrival and departure can be provided additionally.

The PTV Axylog Portal uses the shared GPS positions to perform monitoring, automatic detection of arrival and departure, and continuous ETA calculation. Only GPS positions between the automated detection of an arrival at the first stop and the automated detection of a departure at the last stop of a planned trip in execution are stored and can be visualized in the PTV Axylog Portal. Example: If a vehicle of an external carrier approaches from any location to the first planned stop of a planned trip, the GPS positions which were shared continuously before the arrival at the first stop will neither be stored nor visualized in any grids or in the map of the PTV Axylog Portal.

Live tracking of orders (website)

It is possible to send a message to consignees and consigners via email or SMS*. The message is related to a dedicated order. The message can include a dynamic link which can be clicked by the recipient of the message to open the PTV Axylog live tracking website. The website shows the Estimated Time of Arrival (ETA) in real-time. The information on the website is automatically updated with each event which was triggered by the PTV Axylog app (initiated by the driver).

* To be able to send SMS, external provider data and credentials can be used by PTV Axylog. PTV Axylog does not include its own SMS service. Axylog provides a list of predefined SMS providers.

Alerts and notifications

Alert and notification workflows can be defined in the PTV Axylog Portal. Product "Package 2 – Transport Control Tower" includes sending alerts via e-mail and SMS*.

* In order, to be able to send SMS, external provider data and credentials can be used. PTV Axylog does not include its own SMS service. Axylog provides a list of predefined SMS providers.

KPI dashboard

Transport Control Tower dashboards allow the user to accurately measure carrier efficiency based on acquired telematics data. The dashboards include various metrics and Key Performance Indicators. Thereby the user can efficiently detect tracking issues at an early stage and take measures on it. The dashboards provide the following insights, for example: Individual carrier performance, punctuality per vehicle number plate, which was monitored, situations where automated detection of arrival (based on geofencing) could not be applied.

2.2.4 Add-on Document Management

Document types and status

PTV Axylog Portal is able, to manage any type of documents such as transport documents or waybills. Documents can be transferred to PTV Axylog in PDF, JPG or PNG format. The received files are automatically transferred into PDF format in a further step. In addition, generic PDF document templates can be defined as “attachment”.

Documents can be in only one of the following states: Original, digitally signed or scanned. Only one version of a document is persisted in the PTV Axylog Portal at a time; prior versions are overwritten. It is not possible to view the original and the scanned version of a unique document for example.

Uploading documents

PTV Axylog provides three options to upload documents: API, (s)FTP or manual upload.

Searching documents

It is possible to search for stored PDF documents. Search filters enable the user to select documents based on the properties of the order to which it is linked.

Managing documents

If optical barcode recognition (OCR) is enabled, scanned documents are automatically assigned to the appropriate orders based on the order-ID. If the automatic assignment is not possible without errors (for whatever reason), those documents can be manually verified and assigned to the appropriate order.

Scanning QR- and barcodes

PTV Axylog provides batch processing to internal and external carriers. Multiple scanned delivery documents can be sent to the PTV Axylog Portal via (s)FTP or API. PTV Axylog automatically reads QR- and barcodes on the scanned documents. The codes at least must include the ID of the related order. The page number and the total number of pages can also be considered, to be able to detect and report missing pages.

Digital signature

In the PTV Axylog Portal, documents can be attached to transport orders based on the order-ID. If Package 1 – Proof of Delivery is subscribed, documents attached to orders can be sent to the PTV Axylog App. The user of the app can view the documents on the mobile device. The documents can be included in the electronic Proof of Delivery which allows to acquire a digital signature from consignees or consigners. A new version of the PDF document is created by the PTV Axylog Portal. The document status changes from original to digitally signed.

Dashboard

Specific dashboards include document management specific metrics and KPIs.

2.3 PTV Axylog App (in connection with Package 1)

The mobile PTV Axylog App provides real-time connectivity between users of the PTV Axylog App (typically drivers) and users of the PTV Axylog Portal (typically planners, dispatchers). The core functionality is the ability to carry out an Electronic Proof of Delivery (PoD) via a mobile device.

App download and 2-factor-authentication

The app can be downloaded for free from the Google play store (Android devices) or the Apple app store (IOS devices).

Before the PTV Axylog App can be used operationally, the app user must authenticate. The authentication is only possible for those users of the PTV Axylog App whose account has been created and enabled to use the PTV Axylog App via the PTV Axylog Portal. Therefore at least the name of the carrier, the name of the user and the mobile number of the app user are required.

Enabled PTV Axylog App users enter their mobile number before the authentication can be started. In the next step, a code is sent to the user's mobile device via SMS. To complete the authentication the code is entered in the PTV Axylog App.

App profile update

If the profile configuration has been changed in the backend application, the app profile on the mobile device will be updated automatically.

Offline mode

The PTV Axylog App provides online and offline mode (without existing WIFI or cellular connection to the internet). If connectivity to the internet is not available, all captured data is temporarily stored in a queue on the mobile device. As soon as the connection is restored, the data is transferred to the PTV Axylog portal and deleted on the mobile device.

Share position with PTV Axylog Portal

The app is technically capable, to share positions with the PTV Axylog Portal. The scope of the applied functionality entirely depends on the user's privacy settings in the mobile device's operating system.

By default, single event-based GPS positions can be shared with the PTV Axylog Portal. This functionality is available if at least Package 1 - Proof of Delivery has been subscribed. A detailed description of the functionality is available here: [2.2.2 Package 1 - Proof of Delivery, Positions for ETA calculation](#).

An advanced range of functions can be activated via the PTV Axylog Portal if Package 1 - Proof of Delivery and Package 2 – Transport Control Tower (corresponding to Package 3)

have been subscribed. It is then possible to continuously share positions with the PTV Axylog Portal. In addition to ETA calculation, the core functionalities of the Transport Control Tower can be used; technically enabled by the PTV Axylog App (e.g. tracking & tracing, plan vs. actual comparison, automatic detection of arrival and departure times). A detailed description of the functionality is available here: 2.2.2 Package 2 – Transport Control Tower, Positions and ETA calculation.

Chat

Authorized app users can use the chat functionality in full or with limitations. App users can send text messages, attach documents and images. It is possible to either chat with other users or user groups. Order-related chat is available which automatically attaches text and attachments to one single order. The order-related chat enables efficient communication between planners (via the PTV Axylog Portal) and drivers (via the PTV Axylog App).

Electronic bordereau (trip)

The term Electronic Bordereau corresponds to a planned trip to be executed, which has been assigned and has been made available to a user of the PTV Axylog App. The trip includes all orders in the planned sequence which shall be executed.

Download bordereau: Planned trips get assigned to a specific user of the PTV Mobile App based on the mobile number. The app user receives notifications on the mobile device when a new bordereau or an update was received. In addition, the user can trigger the download manually. The app user only sees one trip at a time. If several trips were assigned to the same user, the actual trip in execution must be completed before the next trip will be made available.

Ad hoc assignment of drivers by scanning: The user can scan a QR- or barcode (e.g., on a transport document) which includes a reference to a planned trip. The app user then gets assigned to the trip and the related bordereau can be pushed or downloaded on the PTV Mobile App. This functionality can be activated via the PTV Axylog Portal.

Change sequence of orders: Users can change the sequence of orders within one single trip. In the bordereau, the user can click on a button to edit the list. The order position then can be changed. This functionality can be activated via the PTV Axylog Portal.

Create new trips

By scanning QR-codes or barcodes (e.g., on transport documents), the user can create a new trip which can include multiple orders. The sequence of orders corresponds to the sequence of scanned codes. This functionality is not applicable in combination with PTV Route Optimiser ST/CL.

Scan QR- and barcodes

Single orders (deliveries or pickups) can include multiple pieces - corresponding to colli such as pallets, parcels, or cages. Individual codes (QR- or barcodes) can be defined for each piece. The codes can be included in the order data and can be transferred via API from a leading system to the PTV Axylog Portal. The user of the PTV Axylog App is asked

to scan the codes while loading the vehicle at a depot and/or while performing pickups and deliveries. The results of completely scanned or missing scanned codes are included in the Proof of Delivery and can be reported via the PTV Axylog Portal.

Empties management

The user of the PTV Axylog App is able, to document the delivered and returned quantity of empties via the app. Empties master data is defined via the PTV Axylog Portal. Each single order can include predefined quantities of delivered and returned empties. Depending on the actual conditions, the user can change predefined quantities and can enter new ones. The number of delivered and returned empties is included in the Proof of Delivery and can be reported in the PTV Axylog Portal. This functionality can be activated via the PTV Axylog Portal.

Payment on delivery

If this functionality is activated in the PTV Axylog Portal, essential payment data, such as the amount of money to be paid and the payment methods which are supported, must be provided from a leading system via API. The user can see the payment data via the PTV Mobile App while performing the Proof of Delivery. The app user is able, to document the payment method (cash, check, or electronic payment) and the amount received. There is no interface available between the PTV Axylog App and any electronic payment providers or terminals used. The documented payment details are included in the Proof of Delivery and can be reported in the PTV Axylog Portal.

Digital signature

The electronic Proof of Delivery is usually confirmed by consignees and consignor by signing on the mobile device (sign on glass). The following additional information is shown as a watermark on the background of the signature field: Name of the signer (in clear writing), order number, timestamp (date, time), coordinates of the location where the signature is made and optional the name of the shipper. The digital signature combines the signature which was provided by the consignee or the consigner with the additional information mentioned above. The digital signature is transferred to the PTV Axylog Portal and stored in PDF format.

PIN

The PTV Axylog App provides an alternative method which can be applied to confirm the Proof of Delivery by using PIN codes instead of the digital signature. PIN code functionality can be activated in the PTV Axylog Portal. The validity of PIN codes can either be administered in the PTV Axylog Portal or through APIs. PIN codes cannot be seen by the users of the PTV Axylog App. The valid PIN is only known by authorized consignees (e.g., trusted employees in the stores of a retail company).

PoD outcomes

There are three possible outcomes for the provision of a Proof of Delivery (PoD):

Compliant (green button): Order can be fulfilled successfully without any constraints.

With reserve (yellow button): Issues occurred while an order is fulfilled. By default, the PTV Axylog App asks the user to select a delivery reason and to take pictures (e.g., of the transport document and the shipment if any damages occur). A maximum of four images per PoD can be captured and transferred to the PTV Axylog Portal.

Not fulfilled (red button): Order cannot be fulfilled. Also, in this case the Axylog App asks the user to select a reason.

3 Product Limitations

Actual product limitations are listed below:

- Standard data retention period for positions is limited to 24 months. Standard data retention period for documents, media files and further data is 12 months. After this period the data will be deleted. Those periods might be subject to change or agreed upon in the individual subscription contract.
- SMS contract and related cost are not included in the offer and need to be provided by the customer.
- Many telematics systems are available, being connected to PTV Axylog. New systems can be connected on request and after technical validation.

4 Handling Concept

The PTV Axylog Portal has a lean design with a high level of user experience. Each user can create a custom workspace by showing or hiding columns and saving certain filter settings. Thus, sufficient information needed can be shown automatically. Data from different sources can be harmonized and displayed with homogeneous structure and content which increases workflow efficiency. The PTV Axylog App simply guides the user through the process steps needed along the transport value chain. The training period for new users is very short. They quickly become productive without having to invest a lot of time.

5 Technical system description

5.1 General

PTV Axylog can be used as a web client and is recommended to be used with the Google Chrome™ web browser on a desktop computer.

Functionality and layouts from untested web browsers and operating system recommendations can vary. PTV Axylog operates via Windows Azure™ on Europe cluster. The Service Description is not an assurance of a claim to all variants.

5.2 Technical scope and requirements

Language and units of measurements: English (US) language and US units of measurement are NOT available in this version.

- Browser: Use the latest version of Google Chrome™ or another Chromium-based browser.
- Client configuration:
- Network bandwidth: recommended connection speed 20 Mbps or more
- Screen resolution: 1600 x 900 (high color quality) or higher (1920 x 1200 recommended)
- Processor: Recommended Intel Core i5 or newer
- Operating system: Microsoft Windows 8 or newer
- Mobile requirements: iOS 11 or newer; Android 5.1. or newer

6 Glossary

Context corresponds to an instance of the product. One instance is assigned to one customer.

ELD stands for Electronic Logging Device. It is a hardware black box from a telematics provider which is typically installed inside the cabin of a Vehicle.

Visibility is the ability to trace and visualize vehicles and therefore the transported goods on the map.

OBU stands for On Board Unit. It is a hardware black box from a telematics provider which is typically installed inside the cabin of a Vehicle.

Order corresponds to one single task, pickup or delivery with a unique order ID.

PoD stands for electronic Proof of Delivery. It is provided by the mobile PTV Axylog App. Typically drivers use the app to document a delivery or pickup of goods and to acquire the signature of consignors or consignees. Thereby processes can be completely digitized and implemented paperless.

PTV Axylog stands for the entire PTV Axylog platform which includes the PTV Axylog App, the PTV Axylog Portal with all frontend-, middleware- and backend services.

PTV Axylog App corresponds to the mobile application which is required to perform PoD.

PTV Axylog Portal includes basic functionality and specific functions of Package 1- Proof of Delivery, Package 2 - Transport Control Tower and the add-on Document Management.

Transport Control Tower provides advance shipping notifications, delivery data and track-and-trace information - and visibility along the transport value chain.