New name – ANT-System goes BeeWaTec-Systems

Automatic goods transport. Reliable. And easier than you imagine.

Automatic Guided Vehicles
Automatic guided vehicle transport systems – this is an international and dynamic growth market. In Pfullingen, set in the heart of Baden-Württemberg, the land of Swabian tinkerers and inventors, ANT-System GmbH develops and distributes AGV systems for the low-cost sector. This makes AGVs of interest for businesses and applications in which automated logistics have not previously figured.

A brief portrait

ANT-System offers complete system solutions for in-house logistics, from AGVs to milkruns, through to complex manufacturing and logistic systems. Our AGV system is cost effective and flexible, and has proved itself in practical use over many years. Through further development of this system and integration in other transport and storage systems we are able to offer our customers tailor-made logistic solutions for lean management.

ANT-System GmbH is an associate company of HAID GmbH & Co KG (laboratory and workplace systems) as well as BeeWaTec GmbH (one of the leading providers of pipe rack systems). Together the three companies have at their disposal extensive development, production and storage facilities in three locations in Pfullingen.

A proven AGV system on the market, long-standing contact with partners, industrial companies and research institutes, an experienced and motivated development team, as well as the resources of both established associate companies – all of these provide the conditions for the firm to be a successful and reliable long-term lean management partner. This is what we also are for internationally oriented companies, because as well as being actively involved in the German market we are taking on an increasing role on the European stage.
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Automatic guided vehicles have become part and parcel of many plants. Their economic and practical advantages, as well as their ongoing technical evolution, have opened up new areas, invariably replacing established transport equipment like forklifts and pallet trucks to create a “stackerless factory.”

**Automation of transport tasks**

Optimize production processes, increase safety, reduce costs – in all of these material flow within the company forms an important consideration. Automation by AGVs offers many advantages here, with the following being the most significant:

- Punctual, calculable and reliable transport processes
- High availability of components for work and assembly stations
- Minimization of stocks and supplies
- Minimization of transport damage and incorrect deliveries, thus avoiding additional costs
- Reduction in number of employees required for transport, thus reducing staff costs
- Cutback in incidents of personal injury

Automatic guided vehicles cover virtually all kinds of transport and material flow applications. They can adjust to variations in transport demands and an increasing degree of automation. And they can generally be integrated in existing production processes with little modification.

**Being simple and flexible is better than being complex and expensive**

The people at ANT-System develop solutions for our customers that are tailor-made to their requirements while still allowing for changes – “dynamic and flexible solutions” in fact. We bank on simple solutions, cost-effective modular systems that follow the lean manufacturing principle. The result are real low-cost solutions that can be implemented simply and at a competitive price, that are reliable in daily operation and can be adapted at all times to changing conditions.
Safe and flexible: the optical tracking

In routing ANT-System focuses on high-quality optical detection system in combination with simple track marks. This solution is less expensive than laser scanning or even induction systems.

Besides low cost, the ANT-System tracking system provides many other advantages:

- **It can’t be easier**: to make a model or for an initial operation, a track of adhesive tape is sufficient. Afterwards, the track is marked with paint.
- **Reliable in continuous operation**: the proven optical tracking system is the key factor for long-term, reliable operation. It also detects heavily soiled or worn-out track lines.
- **Suitable for everyday use and safe**: the tracks are trafficable and instantly visible to people.
- **Open system**: your employees can see where vehicles are passing, allowing them wherever necessary to stop, load and unload, and to send them on their way again.
- **Maximum flexibility**: to change your course, you do not need expensive additional installations. You simply draw a new line on the floor – done.

Examples of heavily worn tracks (e.g. through forklift traffic) where safe driving process is still possible.

Independently on the way: the vehicles

Stops and destinations are marked with short lines along the track and stored in the device control. Though a manual start command, the vehicle is sent away, it searches the route to the desired destination, and executes the commands (macro) stored for this position. As such full AGV systems for simple tasks - without additional central control - can already be realised with simple track markings and a standard unit.

Simple usage example: The worker puts a pallet at the pick-up point and starts the AGV (in this case a Spurmeise). The AGV moves to the pick-up point and scans it, if the position is occupied, it processes the pallets macro. Then it goes to the delivery point, look for a vacant position and places the pallet there.

After completion of the process, the AGV moves back to its home position and waits for the next task.
With us simple systems do not require coordinating control. For more complex functionalities, we offer various system components, from which you can assemble a control system according to your individual requirements. Simple and flexible - self-evident.

**Radio Call Center (RCC)**

How simple the management of an AGV system can be is shown by our handy radio call centre: With this compact device both simple radio call systems and assembly lines can be controlled easily and cost-effectively. The radio call centre is fixed somewhere on the wall, connected to the 230 V supply and turned on. It automatically establishes contact with radio call units and vehicles and handles all the operations of the radio network: transport order input and product flow management, vehicle control, traffic control, block route control and lock transfers up to fire door safeguards, gate-open/close control, elevator control ...

**Human Interface Radio Call Centre (HMIRCC)**

More options for more complex administrative tasks and comfortable processing the price data and transport orders are provided by our Human Interface Radio Call Centre on the basis of an industrial PC, with or without screen. This controller automatically takes over the coordination of vehicles as well as communication with supervisory systems. It handles complex operations and tasks: transport order input and product flow management, vehicle control, traffic control, block route control and lock transfers up to fire door safeguards, open/close gate control, elevator control, clock timing ... The HMIRCC offers the possibility to visualize interferences, route data and transport orders on the screen where they can be edited if necessary. Connection to higher-level controls is possible via a number of interfaces, e.g. Ethernet, Profibus, etc.

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**Task:** Two Spurmeisen are used to bring loaded pallets from the assembly lines to the rewinder.

The worker on the line sends pick-up order over the radio call unit. The radio call centre processes the orders and sends you a free vehicle to the line. This recognises the pallets, takes them on independently and travels with it to the rewinder. At the transponder 22, the AGV queries the radio call centre whether the delivery space 40 is free, if not, it waits for the release. After unloading the pallet, the AGV moves to the alternative route and waits for the next transport order.

The traffic is controlled via the standard transponder blocking control. Each Spurmeise detects when there is another vehicle set before it in the next travel section and in this case waits until the section is free.
Radio call unit

With the radio call units you build a radio-controlled transport system quickly and easily. The radio call units are mounted wherever you want to pass requisitions or transport orders, such as from a workstation, a buffer or a pallet storage space. The radio call centre automatically detects how many radio call units are in the system, then takes over in its transport order control and ensures that the orders become executed by the vehicles.

The eight buttons on the radio call unit can be used as call buttons to request a vehicle or be occupied by a transport order. For example, if one assigns button 1 to the transport order from the pick-up point destination 78 to pallet buffer destination 152, the worker can place a pallet at its pick-up point and press the button 1. Everything else is automatic: The radio call centre requests a free vehicle that takes the pallet to the destination 152 where it is put on a free space. If you wish to create more than eight transport orders in one place, just install a second radio call unit.

Sensors

With radio call units and sensors many types of automatic transport orders can be implemented. Each radio call unit has eight standard sensor connectors for the connection of 24 V sensors, such as photoelectric sensors, load buttons or contacts. If the sensor reports that the monitored space is occupied or empty, the transport order with which the respective button is occupied goes by radio to the radio call centre. For example, full buffer spaces are cleared automatically or empty stock shelves on the assembly line filled. Per radio call unit max. 8 functions can be stored, for example, 6 by means of buttons and 2 sensors.

Transponder

Transponders are RFID tags that are installed subsurface - under the tracks. A permanent code is stored on them; they send this code to the reader of a passing AGV. The device control queries the commands from their transponder database, which are associated with the code, such as stop (as with optical marks), take left or right turn (for switches), slow down, automatically lower the fork, activate sensors for conveyor belts ... Thus, commands can be assigned locally. And be changed in the database at any time.

Fine positioning marks

Sometimes it depends on the highest switching inaccuracy, such as the transfer of goods on to a shelf. Small plate marks mounted on the floor serve as fine positioning marks, where the AGV can align its motion.
Constant acceleration and deceleration, heavy loads and vibrations - production and warehouse environments require loadable vehicles. Accordingly demanding are we in the selection of components for the devices.

With solid base design, solid mechanics and electrical components that meet the harsh working environment, our devices are proven over many years in continuous use. And of course they meet all relevant safety standards.

Less is more: If possible we use uniform components in different product lines - parts that are proven in forklift area of designed specifically for our needs. Due to this modular principle we can focus on fewer components. The parts will be cheaper for you and if needed, they will be ready quickly as replacement parts.

Control panel
The uniform control panel shows the most important status messages and is used for direct input of commands and drive targets.

Control system
The compact control unit is tailored to our facilities. Their sturdy, vibration-resistant design ensures a long service life.

Optical tracking
The optical tracking is a process-safe and extremely reliable system. It ensures continuous operation with excellent directional stability without lurching, even with worn or even interrupted lane markings.

Transponder reader, inductive sensor
The transponder reader serves as a readout unit for the transponder installed subsurface. The magnetic inductive sensor detects fine positioning marks on the floor. These two components provide additional functionality for complex and at the same time precise automatic movements at the respective location – manoeuvring, parking, picking up and delivery ...
Safety equipment

A high-quality security laser scanner scans the route in the motion direction and avoids collision with people. As well as the other safety precautions (flashing light, emergency stop, etc.), it conforms to the requirements of DIN EN 1525. The safety packages can be customized on request.

Bumper (optional)

The large-surface bumper is an affordable alternative to the security laser scanner.

Energy supply

Our vehicles operate with rechargeable 24 V batteries that meet relevant and safety standards. The battery capacity is matched to your application, depending on shift type, transport mode, etc.

In the standard version the devices are provided with a connector for manual charging of the batteries at a charging station. A manual battery change is also possible - as needed - so that the unit is immediately ready for use again, or upgrade to on-board load: Here the charger is provided in the vehicle so that it can be recharged from any power socket.

Automatic battery charging system (optional)

For automated processes without staff, the automatic battery charging system is recommended: At low charge state, the vehicle moves to the loading station where it gets in contact with the battery charger over sunken points of contact.

Battery exchange station (optional)

Greatest possible operational readiness of the vehicles is achieved with automatic battery exchange station (only for Spurcarrier and Spurmaus). The station automatically removes empty batteries from the vehicle, place them in a free recharge compartment and puts fully charged batteries into the device.
The Spurmeise is a versatile all-rounder. It takes on pallets and box pallets independently, drives to the desired storage location, looks for a free position and delivers the load. It is also possible, to deliver or collect conveyed goods to and from shelves (up to max. 1.50 m height). With the help of our belt conveyor (page 25), it is also able to carry KLTs and thus automatically fill flow racks. The standard version of the Spurmeise is designed to transport sizes from 80 x 120 cm (special sizes on request).

The device control of the Spurmeise enables both the integration into a complex AGV network and stand-alone applications. The necessary manoeuvres, such as for parking are undertaken by the Spurmeise independently, triggered for example by transponder at the respective positions. It is always possible to manually intervene, e.g. to depose of or take on the load at an unscheduled point - in manual mode the Spurmeise offers the full functionality of a towing bar forklift truck.

When you have finished, you simply guide the Spurmeise back to the track and send them further in automatic mode.

**Technical data**

- **Circuit voltage:** 24 V
- **Wheel configuration:** 3-wheeled
- **Weight category:** max. 1000 kg/higher weights on request
- **Speed:** 0,1 – 1 m/s (freely programmable)
- **Guidance:** optical
- **Prevention of collision with people:** security laser scanner/bumper
- **Energy management:** application-specific energy management

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**Pallets**

**Lattice boxes**

**Belt conveyor with SLCs**
HEAVYMZEISE

The Heavymzeise demonstrate their capabilities wherever greater loads and long battery operating periods are required. Modern and attractive design, combined with robustness and reliability are the most prominent characteristics of this vehicle. The Heavymzeise is a compact and versatile vehicle designed for the transportation of euro pallets and crates. Since it is modular, it can be adapted to the requirements of the desired load.

Proven truck components and good accessibility guarantee a long service life, high availability over many years and low maintenance costs.

Technical data

- Circuit voltage: 24 V
- Wheel configuration: 3-wheeled
- Weight category: max. 1600 kg/higher weights on request
- Speed: 0.1 – 1 m/s (freely programmable)
- Guidance: optical
- Prevention of collision with people: security laser scanner/bumper
- Energy management: application-specific energy management
A compact design with sturdy base frame and large, flat load area to make the Spurcarrier a versatile transport platform. By means of individual structures, numerous application solutions can be realised, e.g.:

- Use as KLT transporter
- Automatic placement on shelves or conveyor belts by means of chains, rollers or belt conveyors, shooter mechanism ...
- Mounting frame, which transports assembly groups from one work group to the next work group through the entire assembly process

In the bidirectional version, the Spurcarrier can travel to the point of load transfer and travel back on the same track without turning.

**Technical data**

- Circuit voltage: 24 V
- Wheel configuration: differential drive
- Weight category: max. 3000 kg/higher weights on request
- Speed: 0.1 – 1 m/s (freely programmable)
- Guidance: optical
- Prevention of collision with people: security laser scanner/bumper
- Energy management: application-specific energy management
SPURCARRIER-LIGHT

The Spurcarrier-Light offers the most cost-effective start-up into the AGV world. By using the BeeWaTec pipe system, the vehicle is modular and extremely flexible in design. A plane transport platform provides the opportunity to realise all the add-ons. Thus, assembly stations, workflows and transport tasks can be customised. With proven components and structures, high availability and low maintenance costs will be achieved.

Technical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit voltage</td>
<td>24 V</td>
</tr>
<tr>
<td>Wheel configuration</td>
<td>differential drive/3-wheeled</td>
</tr>
<tr>
<td>Weight category</td>
<td>max. 500 kg/higher weights on request</td>
</tr>
<tr>
<td>Speed</td>
<td>0.1 – 1 m/s (freely programmable)</td>
</tr>
<tr>
<td>Guidance</td>
<td>optical</td>
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<tr>
<td>Prevention of collision with people</td>
<td>security laser scanner/bumper</td>
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<tr>
<td>Energy management</td>
<td>application-specific energy management</td>
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</tbody>
</table>
The Spurtruck is an automatic tractor that brings and removes trailers to/from the assembly or manufacturing stations. The trailers are manually or semi-automatically connected and disconnected; several types of coupling can be mounted as needed. Due to its short wheelbase it achieves maximum agility; positioning is done either via transponder or fine positioning marks.

The vehicle is compact and service-friendly: after removing covers all components are easily accessible.

**Technical data**

- Circuit voltage: 24 V
- Wheel configuration: differential drive/3-wheeled
- Weight category: max. 1400 kg/higher weights on request
- Speed: 0,1 – 1 m/s (freely programmable)
- Guidance: optical
- Prevention of collision with people: security laser scanner/bumper
- Energy management: application-specific energy management
The Spurmaus is an under ride tractor that brings and removes trolleys or under ride trailers to the production stations. By means of a sensor control, the vehicle is manoeuvred under a guide rail mounted on the shelf trolley and extends a locking bolt that drags the shelf trolley along. The car is then guided by the AGV by means of two castors.

Due to its compact design the Spurmaus disappears completely under the transported object and is therefore ideally suited for confined space conditions. It can move under the vehicle both forward and backward and take it on. In addition, it can turn around 90° about the center of the wheel axis so that the greatest possible manoeuvrability is achieved.

**Technical data**

- **Circuit voltage:** 24 V
- **Wheel configuration:** differential drive/
  3-wheeled
- **Weight category:** max. 750 kg/higher weights on request
- **Speed:** 0,1 – 1 m/s
  (freely programmable)
- **Guidance:** optical
- **Prevention of collision with people:** security laser scanner/
  bumper
- **Energy management:** application-specific energy management
Costs for transporting and delivering goods can account for up to two-thirds of total production costs. If human resources are used to get goods from A to B, productivity and efficiency often fall by the wayside. The ANT-Mini can optimise your costs even where the typical losses associated with conveyor belts or forklift trucks are concerned. As such, it represents the alternative solution of choice.

The ANT-Mini is a small automatic guided vehicle (AGV). It is a cost-effective entry-level unit for newcomers to the world of AGV. Assembly stations, workflows and transport tasks can be customised with the ANT-Mini to meet both the prevailing needs of the corresponding application and customer requirements.

**Technical data**

- **Circuit voltage:** 24 V
- **Wheel configuration:** differential steering (panzer)
- **Load capacity:** from 100 kg up to 2500 kg
- **Tractive force:** from 100 kg up to 2500 kg
- **Speed:** 0.01 – 1 m/s
- **Guidance:** optical/magnetic
- **Prevention of collision with people:** security laser scanner/bumper
- **Energy management:** application-specific energy management

The ANT-Mini is characterized by its modularity as well as by its low, even and small design. Thus, it is very flexible in carrying out a wide variety of tasks. Add-ons or installations of individual devices give a unique look and function to the ANT-Mini. Thanks to the modular design of this type of vehicle (ANT-Mini), different modules can be combined according to the customers’ requests. The ANT-Mini can even run on tight and small spaces, without special adaptations within the surrounding environments. The vehicle is able to carry out its internal transports in the most different ways: Simple transports, installations of roller tracks or intelligent robots up to complex assembly vehicles.
MILKRUN-SYSTEMS

The concept is based on the principle that material is only replenished in as far as it is required, in the same way as the milkman used to deliver only just as much milk as there were empty bottles in front of the door. With our transport systems (depending on application e.g. Spurtruck or Spurmeise) and trailer types a whole range of supply solutions can be realised, such as:

- SLC trailers to take euro norm shipping containers
- Platform trolleys in various versions
- Stainless steel and wire mesh trolleys for various items: multi-storeyed for SLCs or other piece goods, for large plates, with numerous individual compartments, etc.

Further information and individual advice can be obtained on request.
BEEasy is the term for the possibility to quickly and flexibly adapt your route layout. In fact easily. The concept is based on the principle that material is only replenished in as far as it is required, in the same way as the milkman used to deliver only just as much milk as there were empty bottles in front of the door. The number of trips required to replenish stock is reduced by constructing intelligent links between the areas where the material is stored and used (production and assembly lines) and the travel routes; while by planning supply quantities and journey cycles the number of movements needed to replenish stock is cut back, resulting in reduction in costs.

With our transport systems and trailer types a whole range of supply solutions can be realised, from automatic AGV solutions, trains with removable platform trolleys, right down to simple guidable trolleys – the following page will provide you with an overview.

Further information and individual advice can be obtained on request.
BEEasy trailers are combinable amongst themselves, with max. 5 trailers (additional weight max. 3000 kg). Individual platforms/trailers carry up to 800 kg (depending on wheel equipment).

Through the „BEEasy to change“ principle a pipe frame attachment can be mounted at any time.

**Base frame**

**Rotating mechanism**

for turning frames

**Turntable variant**

for the best possible directional stability, max. load 300 kg

**Stacker truck bracket**

for transport

**Adaption set**

for BEEasy 6 (with/without wheel). different variants available.

**Angle brackets**

7° or 15° for tilting box pallets for better removal

**Grips**

Flexible racking on the frame of the platform (all 4 pages) or slide grip for sticking into the provided pipe receptacles

**Coupling & towing bar for BEEasy**

Further details on request.

Note: Depicted combinations show examples of wheel version with polyurethane Blickle Extrathane® tread. Further wheels on request.
**Option**

Simple platform with platform size 1200 x 800 mm with pipe racking system by G.S ACE

**Option**

Tilted support for pallets

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**115976  BEEasy 4D**

Simple turntable trailer with platform size 1200 x 800 mm

**115975  BEEasy 4**

Simple platform with size 1200 x 800 mm with two guide castors and two fixed castors

**115977  BEEasy 6**

Simple six-wheel trailer with platform size 1200 x 800 mm

**116286  BEEasy 4**

Simple platform with platform size 1200 x 800 mm with two guide castors and two fixed castors and removable grip
**Stackable**  
for compact storage or cross-works transport

**Individual trailer**  
You can construct the base frame of your own transport trolley using the 45 x 45 mm square pipe system with the superstructure built using the pipe racking system by G.S ACE. Various types of castors, couplings and towing bars are available. The new turntable construction guarantees excellent and extremely precise directional stability.

Further information on request.

**Option**  
Rotating mechanism

Note: Depicted combinations show examples of wheel version with polyurethane Blickle Extrathane® tread. Further wheels on request.
**BEEASY2E**

115099  **BEEasy2E (Trailer)**

Trailer for carrying large, medium or small platforms (BEEasy4E) with max. 500 kg,
Surface finish: galvanised
External dimension incl. edges and footboard (L x W): 1530 x 1250 mm
Note: Please contact us for corresponding platforms.
In companies where lean management is deployed successfully and in which production work is planned and organised meticulously, there is a place for everything and everything is in its place. However, in practice, it is not uncommon for the wrong material to end up in the wrong place at the wrong time, despite all materials, boxes, workstations, feeder belts, etc. being comprehensively labelled.

As a consequence, production processes are interrupted or errors are made in production or assembly. Although having an effective Kanban management system in place can control the time at which a material finds itself in a specific location, this does not absolutely guarantee process reliability.

The use of an AGV system can significantly increase process reliability, as the AGV is able to complete a defined process without errors and can thus be relied upon to safeguard the transportation of goods (and therefore the process itself) between different locations. Milkrun and tugger train systems combined with a "hand shooter" can safeguard process reliability in the transportation of goods.

With predecessor solutions, intelligence and the assurance of process reliability were in human hands due to the absence of automated checks and controls to determine if the right material was in the right place.
CAN BE WELL INTEGRATED

In order for an automated transport solution to run successfully, it must be suitable for integration into the entire production system. The interfaces for take-over and transfer of the transported goods has a key role, as well as the question of whether the AGV solution is flexible and adaptable to changing production processes. ANT-Systems offers solutions that allow you to work efficiently and flexibly. Over time.

**Individualised pipe constructions**

With the BeeWaTec pipe racking system by G.S ACE you build exactly the solution you need: trolley for coupling to the Spurtruck, storage racks on castors with sturdy base frame and fork sockets for loading the track with Spurmeise, individual piping structures on the Spurcarrier, Shooter functions provide for automatic transfer of the KLT ... The pipe racking system is lightweight yet stable, extremely versatile and can be flexibly converted at any time. Thus, real lean management.

If required, even the complete drive and control equipment of the vehicles can be accommodate in a pipe frame.
Belt conveyors

The ANT-System belt conveyors expand the usages of the Spurmeise with the transport of KLTs. It is designed so that the Spurmeise can automatically receive it: a locking position by means of bolts prevents the conveyor belt from slipping; sliding contacts supply it with power from the Spurmeise. Thus, the Spurmeise can bring the load automatically into position, trigger the conveyor belt’s motion, deliver the KLTs on the shelf and/or place it on the conveyor belt and take other KLTs. And when it has delivered the belt conveyor again, the Spurmeise is free for the transport of pallets, etc.

The belt conveyor is designed to handle six KLTs in the format 300 x 400 mm (other dimensions on request). The additional equipment for the Spurmeise (photocell, relays, etc.) is included in the package.

**Technical data**

- **Dimensions:**
  - Conveyors: 1140 x 960 mm (L x W)
  - Conveyors: 412 x 900 mm
- **Load:**
  - 50 kg per track
Upgrade of AGV equipment at Claas

Technical requirements and implementation
Based in Harsewinkel, Germany, Claas is a leading manufacturer of agricultural machinery (combine harvesters, tractors, harvesting machines). In 2012, its existing AGV equipment (cabs and cab carriers), which had been installed in 2011, was upgraded by ANT-System GmbH of Pfullingen, Germany, benefiting from both a new central control system and new vehicle controllers. 37 optically guided vehicles (AGVs) operate on 2 tracks. On track 1, the driver’s cab is manufactured on a continuous assembly line. On track 2, the cab is combined with the base carrier.

The battery charging and changing tower provides a shared interface for the two systems. This is where the batteries of both types of vehicle are changed during live operation. The process is fully automated.

The old vehicle controllers for the 7 cab carrier AGVs and the 30 cab AGVs have been replaced by a new PLC along with an intelligent I/O card (the latter being an in-house innovation). The entire safety technology of the AGVs was brought up to the very latest standard with FlexiSoft by SICK AG. The PLC is a standard component which is also used for snow groomers.

The existing master control was replaced by a Siemens software PLC (WinAC). WinCC provides a flexible reporting system and visualisation solution. The software PLC is characterised by the fact that it combines conventional PLC functionality with PC hardware (Windows). Accordingly, secure control and visualisation/operation is safeguarded by hardware (a device).

Additionally, changes were made to expand the track for the cab AGVs at the same time, as a picking zone had to be integrated into the process.
In autumn 2012, an AGV system with one vehicle was installed at the premises of the glass bottle manufacturer Ardagh Glass GmbH in Obernkirchen, Germany. The optically guided „Spurtruck“ by ANT-System GmbH transports moulds from the mould area to the production line on a track approx. 150 m in length. At the customer’s request, the track has been expanded to include additional functions.

Depending on the number of moulds to be transported, one or two trailers can be attached to the „Spurtruck“. The trailers have been built using modules taken from the assembly kit system supplied by BeeWaTec GmbH. The automatic guided vehicle system operates without a master computer and as such is an example of a system that is very easy to run. The opening and closing of the high-speed door, which is located directly on the track, is implemented with sensors that are installed externally.

Should the number of moulds to be transported increase, more vehicles can be added to the system with ease.

**Highlights**

The highlights of the new master control include central timing of the vehicles and optimised traffic control. Furthermore, the master control has been integrated into the Claas quality control loop and meets all requirements relating to production control (Q alarm, Q stop). The production process is completed by additional functions such as go to sleep/wake up, break control, freely configurable cycle times and assembly times as well as activation/deactivation of functions.

The AGV master control receives the new production schedules on a daily basis via the company network and also monitors incoming goods to ensure that the correct types of cab frame are made available for assembly. The master computer also triggers the signal which tells the forklift driver which cab is required next in the production process.

**Implementation in practice**

The upgrade to the new master control took place during the plant’s annual shutdown period. Over a 5-week period and with production still running, the 37 vehicles were gradually upgraded and integrated into the system. So that all required functions could be supported, communication between the vehicles and the master computer had to be completely redefined. The biggest challenge was to operate both protocols in parallel so that old and new vehicles could be in operation at the same time. This was the only way to achieve a smooth transition without interrupting the production process.

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In autumn 2012, an AGV system with one vehicle was installed at the premises of the glass bottle manufacturer Ardagh Glass GmbH in Obernkirchen, Germany. The optically guided „Spurtruck“ by ANT-System GmbH transports moulds from the mould area to the production line on a track approx. 150 m in length. At the customer’s request, the track has been expanded to include additional functions.

Depending on the number of moulds to be transported, one or two trailers can be attached to the „Spurtruck“. The trailers have been built using modules taken from the assembly kit system supplied by BeeWaTec GmbH. The automatic guided vehicle system operates without a master computer and as such is an example of a system that is very easy to run. The opening and closing of the high-speed door, which is located directly on the track, is implemented with sensors that are installed externally.

Should the number of moulds to be transported increase, more vehicles can be added to the system with ease.
Miele & Cie. KG continues to put its faith in AGV

ANT-System has installed a new AGV system at the Miele site in Lehrte, Germany, which is home to the Group’s production plant for industrial washing machines. This is the Miele Group’s second AGV system, supplementing the one already installed at its plant in the German town of Warendorf.

This latest project is based on the same proven optical tracking technology that has shown itself to be so reliable in the plant at Warendorf. Moreover, the same types of vehicle are being used. Two automatic guided vehicles (AGVs) take care of waste disposal for the production lines (single-shift operation).

The machines which are ready for dispatch (on transport pallets) are made available at transition points at ground level, as well as on conveyor belts, for transportation to the corresponding warehouse area by the AGV. Optical distance sensors are used for order generation. At the manually operated pick-up points, the machines detect the distance sensors and trigger the transportation order; on the predecessor conveyor system, this was done with light barriers.

ANT-System GmbH has provided a standard AGV master control which coordinates the AGVs and integrates the high-speed gates and fire protection gates at the passages between the halls, including the traffic light system at crossing areas. This is a simple and cost-effective master control which is based on the processing of digital signals. The simplicity of the system is topped off by manual battery changes at the end of a shift. The overall result is a cost-effective AGV system which pays off even in single-shift operation.

The project was delivered working in close cooperation with Miele, as the necessary construction works were carried out by the company itself (installation of the track, „elo“ installation, etc.). ANT-System frequently works in this way, with its customers being allowed to carry out any and all work that they wish to and are able to complete themselves.
AGV at Avery Dennison in Belgium

In cooperation with its Belgian partner NV FERAG SA, ANT-System GmbH has installed an automatic guided vehicle system (AGV) with optical tracking at one of the plants operated by Avery Dennison, a leading manufacturer of industrial tapes for the hygiene sector.

The overall system consists of a „Spurmeise“ type AGV, which is responsible for the transportation of pallets, and a master computer, which coordinates order management, traffic control and communication with the packaging machine. Orders are generated with ANT-System’s radio call unit, which supports the wireless transmission of up to 8 different orders to the master computer. The overall system is to be implemented in three stages, with the ultimate aim being to replace the entire pallet transportation system that is currently used in production with an automatic guided vehicle system.

Stage one, which was completed in 2013, involved the AGV taking over waste disposal on the production line, which consists of 5 machines operating in a two-shift pattern. In the first stage of expansion, the AGV transports pallets with finished goods from the pick-up point at the machines to a central packaging machine, which then heat-seals the pallets and forwards them to the warehouse via a conveyor system.

As described above, orders are generated with the radio call unit supplied by ANT-System. The machine operator presses a button on the unit to confirm that the pallet is ready to be picked up. The orders are received by the master computer and distributed to the AGV according to the principle of FIFO. Communication with the packaging machine and the warehouse controller connected to it, as well as the opening and closing of the high-speed gate on the circuit, are managed via the master computer.

During the second stage, which is scheduled for 2014, additional machines in production will be integrated into the AGV system and the track will be expanded accordingly. In the final stage, the supply of empty pallets to the machine, which has been a manual process until now, will be taken over by the AGV system. As part of the expansion of the system, a second AGV will be added in order to manage the increase in the volume of goods to be transported.

The simplicity of the system is topped off by manual battery changes at the end of a shift. The result is an overall system which is very easy to operate.
ANT-System is your contact partner for one-stop AGV solutions. We offer not only vehicles and control systems but also related equipment concepts and services – all designed to provide you with an individual solution.

Advice and distribution
Get on-the-spot advice from our sales representatives. They will be delighted to show you what solutions we are able to offer for the handling of your requirements. If our standard systems are the right solution for you, you will be pleased with our quick delivery times. And if you need special configurations or modifications you will profit from our technical know-how as a manufacturer. We always find a solution.

Planning of facilities
Every AGV system is an individual solution. For this reason we work out your specific requirements, define starting, storage and parking positions, and develop the route design. According to need we set up the transponder data bank and transfer it to your vehicles. The final result is a thoroughly thought out concept that corresponds exactly to your requirements while being open for future changes.

Installation and startup
Starting up an AGV system demands preparation: the laying down of guide tracks, installation of a radio control system and chargers, fine adjustment of movements at the collection and delivery locations, trial runs, etc. We set everything up and hand over to you a completely operational system. Needless to say we brief your staff on the use of both the individual pieces of equipment and the whole system.

Accident prevention regulation checks
As part of a maintenance contract we carry out regular accident prevention checks for you.

Maintenance and servicing
As the manufacturer we are also your contact for maintenance, repairs, the provision of spare parts, software updates and so on. Everything relating to the maintenance contract, in fact – just as you would like.

Refit
No system always remains the same: there will be changes to the layout of the factory and route design, additional vehicles will be needed, new control software or concepts will be introduced. We will help you to bring your AGV system right up to date. Regardless of whatever system you have worked with up to now.
SPACE FOR NOTES