AG4000T
USER MANUAL

AG-4000-400001, AG-4000-600001

AG4000T (print & apply system)

User Manual: AG4000T Version: 1.1 draft (needs revision)
Issue Date: April 2021

1 Contents

2 Introduction

2.1 Overview

Godex AG4000T print & apply systems employ ZX1000(X)i printers, either with 203, 300 or 600dpi print resolution, with high end, air-driven tamp applicators with the purpose of print and apply labels on demand.

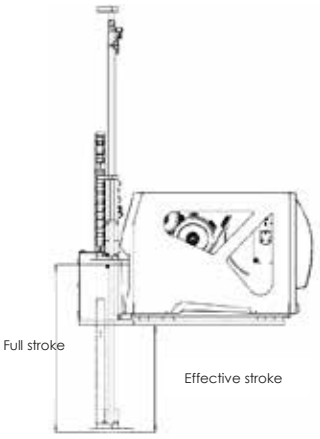
AG4000T print & apply systems are available as easy to install, ready-to-use solutions, but you can also configure your own customized systems by combining the components in a different way. The AG4000T applies the last printed label to the product, what enables you to attach unique information to each single product coming down the production - or packaging line. With the very same standard applicator head you can apply labels from 20x10 mm up to 100x100 mm. With custom heads AG4000T can handle any label size from 20x10 mm up to 100x200 mm. Suspended heads are available for use to label skew products that are not perfectly parallel to the applicator head. Tamp applicators are typically used to label non-moving items on intermittent conveyor systems, in robotized processes, and in manual workflows. With roll-on and blow-on heads, available on request, they will also label moving products accurately. AG-4000-400001 delivers an effective stroke of 250mm (total stroke 400mm) and the long stroke version AG-4000-600001 delivers 450mm (total stroke 600mm). Various customization options are available on request to tune the AG4000T to your particular needs.

2.2 Applicator Specifications Summarized

Type:	AG4000T – 400 mm	AG4000T – 600 mm
Item no:	AG-4000-400001	AG-4000-600001
Std. head size:	100mm x 100mm	100mm x 100mm
Opt. head sizes:	20mm x 20mm up to 100mm x 200mm	20mm x 20mm up to 100mm x 200mm
Stroke	400mm	600mm
Effective Stroke	250mm	450mm

(The effective stroke equals the maximum allowed height difference between the products in one production batch)

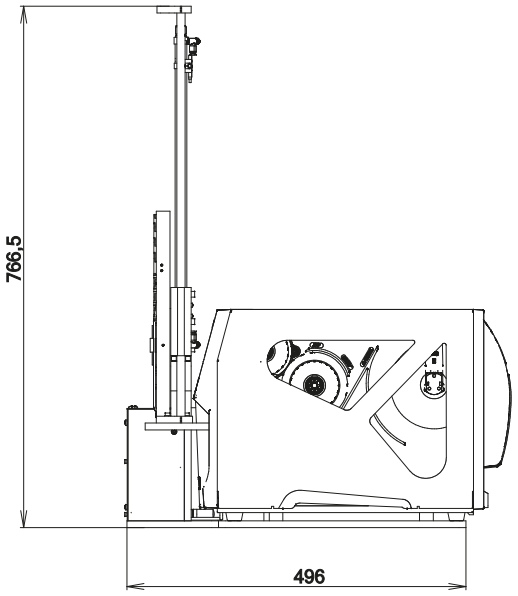
Label sizes	min 20mm x 10mm, max 100 x200mm
Label roll diameter	200mm standard inside the printer 280mm optional with external holder
Performance*	up to 30 labels/min of 100mm x 100mm at an effective stroke of 170mm up to 60 labels/min of 20mm x 20mm at an effective stroke of 10mm
Compatible printers	ZX1200i (203dpi) / ZX1300i (300dpi) / ZX1600i (600dpi) ZX1200Xi (203dpi) / ZX1300Xi (300dpi)



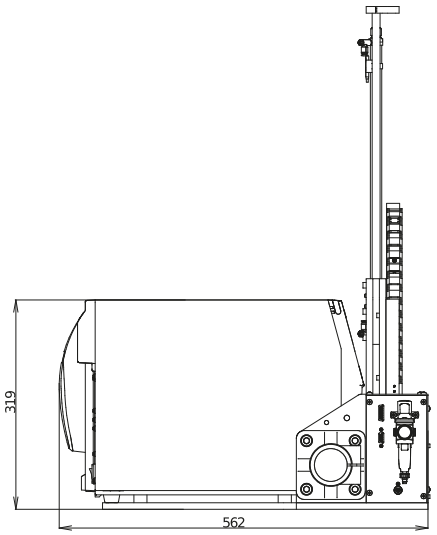
Pic. 1

**: the process speed depends on variables such as label size, the type and source of the data processed, stroke length (product height), required product contact time and conveyor speed.*

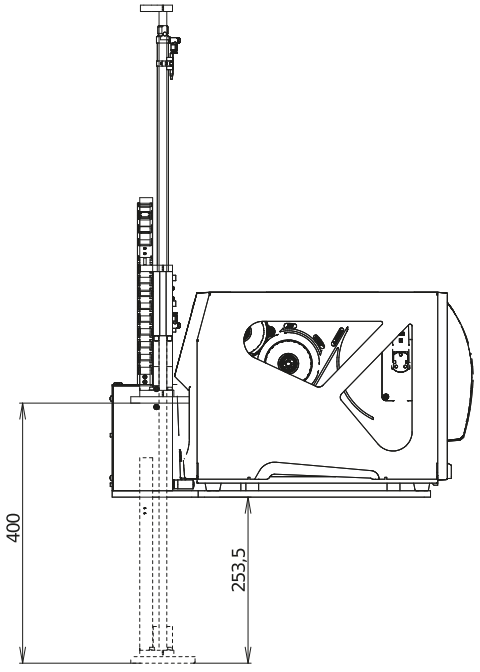
2.3 Dimensions AG4000T – 400 mm



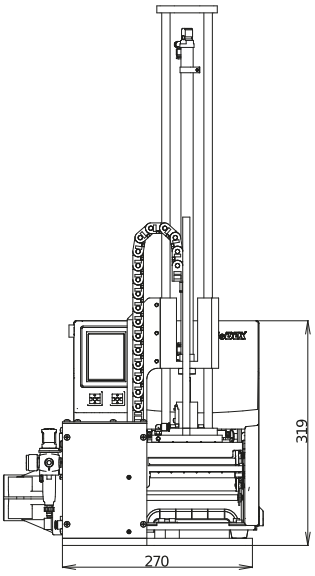
Pic. 2



Pic. 3

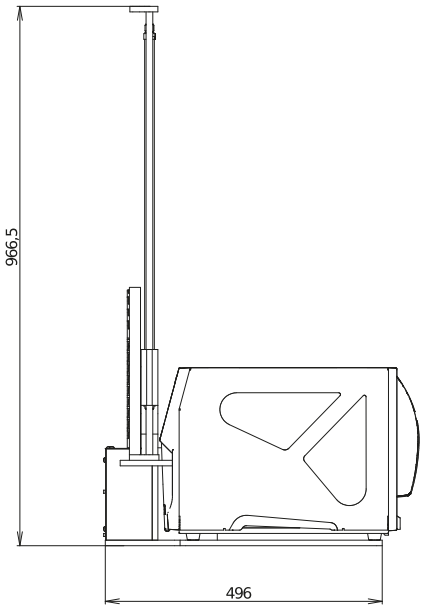


Pic. 4

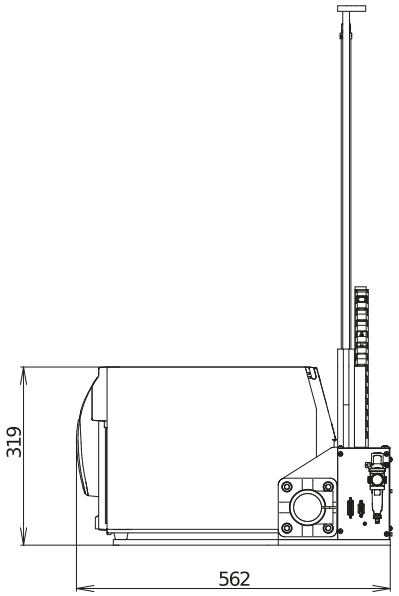


Pic. 5

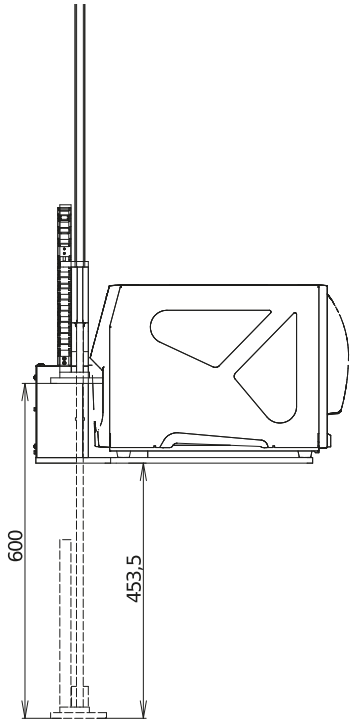
2.4 Dimensions AG4000T – 600 mm



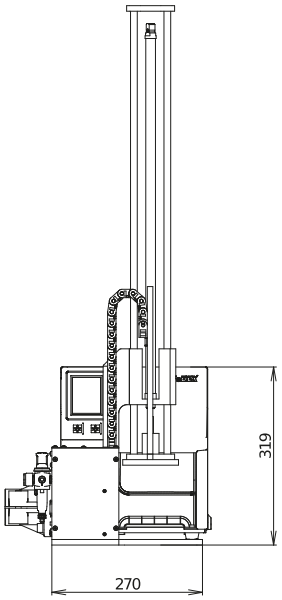
Pic. 6



Pic. 7



Pic. 8



Pic. 9

3 Basic Safety Precautions

3.1 Coverage

Safety rules and instructions either written or referred to in this manual apply to the installation, the usage and the maintenance of both the applicator- and the printer components within AG4000T systems. They do however not replace any safety instruction published in separate Godex ZX1000(X)i user- and service manuals, and must be considered complementary to those instead. Therefore, personnel working with AG4000T systems must be familiar with the safety instructions stated in the applicable Godex printer manuals as well.

3.2 Following the instructions in this operating manual

A thorough knowledge of basic safety instructions and safety regulations is an essential prerequisite for using this device in accordance with safety requirements, while ensuring its fault- free operation. This operating manual, and in particular the safety instructions contained herein, must be adhered to by any personnel using the device. All relevant standards and regulations pertaining to the prevention of accidents and injuries relevant to the device installation site must also be adhered to.

3.3 Possible device handling risks

The device was manufactured in accordance with relevant technical requirements and internationally recognized safety and technical standards. However, situations might still arise during the use of the device that could pose a risk to the health and/or lives of operators and/or third parties, or cause damage to the device and/or other property.

The device may only be used:

- In accordance with the purpose for which it was manufactured
- If it is free of any defects in terms of safety and technical requirements.

Any defects that could potentially compromise safety must be rectified immediately.

3.4 Environmental conditions of the device operation

- Operation ambient temperature within the range of 5 °C to 40 °C (41 °F to 104 °F)
- Storage and transport temperature: -20 °C to 55 °C (-4 °F to 131 °F); the device can withstand temperatures of up to 64 °C (149 °F) for a period of up to 24 hours
- Operation ambient non-condensing relative air humidity within the range of 20% to 85% RH
- Storage ambient non-condensing relative air humidity within the range of 20% to 85% RH

3.5 Occupational health and safety rules

The device contains moving parts that can pose a risk to the operator unless the safety rules are adhered to. In order to prevent a potential injury, read the following safety rules carefully:

- Only persons trained in operating the device and acquainted with associated risks should be authorized to enter the space where the device is installed.
- A safe distance from the application plate must be maintained when the device is being connected to a source of compressed air and/or when it is being switched on or off, as the device may begin to move unexpectedly.
- Crumpled and/or detached labels may only be removed when pressurized air is not being supplied to the device or if the device has moved into an error mode.
- An error or pause mode must be invoked before print material is replaced in the device.

3.6 Safety instructions

- When working with the device the operator must adhere to all relevant generally binding safety regulations as specified in the labor code of his/her country and in other legal safety regulations that may apply.
- The device's keeper must ensure the performance of regular maintenance. Routine maintenance must be carried out by properly trained and authorized personnel. Failure to do so could result in device failure or injury and may breach health and safety laws.
- The device may only be operated by properly trained and authorized personnel.
- The device may only be used for those purposes for which it is technically fit in accordance with the terms and conditions specified by the manufacturer, while the structure, design and technical condition must comply with the relevant safety regulations.
- The device's operator must perform a visual inspection of the device regularly, along with regular basic maintenance and servicing.
- Should there be a discovery of any defect and/or damage that might compromise operating safety and/or the operation of the printer that cannot be rectified on the spot, the device must not be brought into operation / must be switched off immediately, and the defect must be reported to the device's keeper and other relevant persons.
- The legibility of safety signs, symbols and notices on the device must be maintained at all times. In the event of damage and/or illegibility, any such signs must be restored by the device's keeper to their original condition.

3.7 Never:

- Connect the device to a source of electric power if any of the protective parts (electric component covers, safety labelling and/or safety elements of the device) have been removed and/or damaged.

- Modify the mechanical design and/or electrical circuitry of the device in any way.

- Perform any maintenance tasks before the device has been secured in its off state and the device has been disconnected from the main power.

3.8 Applied harmonized standards and the safe use of electrical appliances

- AG4000T Print & Apply systems are class I electrical devices in terms of the necessary protection against electric shock in accordance with harmonized standard EN 61140, ed. 2 and hence also meet generally acknowledged standards such as, but non only CE, meaning that all non-live conductive parts are mutually conductively connected and are further connected to the protective earth conductor of the printer's power supply. Other harmonized standards that have been applied, are EN 60439-3, applicable to low-voltage switch gear and EN ISO 12100 regarding the safety of machinery.

- Connection to the power network supply must be made in compliance with the requirements specified in regulations and technical standards valid and applicable in the country of operation.

- Any work on the device may only be performed by persons who are duly qualified according to the legislative code of the country where the device is installed (1) and who has been acquainted to the necessary extent with the device (2).

- The keeper of the device is obliged to secure the performance of inspections of the electrical device in prescribed intervals and to do so in accordance with the legislation regarding such inspections applicable in the country of operation.

- The device may not be dismantled.

- If shielded data cables are used with the device, they must comply with international standards governing devices producing electromagnetic radiation. The utilized data cables must be completely shielded. The use of shielded data cables is necessary in order to prevent the production and/or reception of electromagnetic noise. Using non-shielded data cables may result in electromagnetic radiation exceeding permitted limits.

3.9 The possible risks of electric shocks if working with the applicator

Despite the application device being manufactured in accordance with relevant technical regulations pertaining to safety, its technical design cannot preclude all risks that may occur, especially in the event of careless or negligent behavior during use of the device. The device must be used with full awareness of the following risks of electric shock:

- Resulting from direct or indirect contact with parts designed to conduct electric current (live parts), direct or indirect contact during the removal of electric equipment covers, or direct or indirect contact in the event of damage caused to insulating parts of a movable power cord;

- Caused by damaged parts of electrical equipment;

- Resulting from a failure to observe instructions regarding equipment connected to the power mains.

3.10 Configuring the pneumatic unit, safety

Excessive operating pressure may cause:

- Injury by crushing;
- Mechanical damage to parts of the labelling machine.

The equipment manufacturer configures the pneumatic unit of the labelling machine in a manner that ensures all pneumatically controlled parts of the device (e.g. the piston) can be stopped by hand without the use of excessive force (max. 150N)

The customer shall bear responsibility for any adjustments that are not made by the equipment manufacturer prior to delivery.

4 Contents of delivery - what's in the box?

4.1 Standard configuration with 250 mm effective stroke

AG4000T systems can have slightly different configurations, however, the installation and operation of most configurations are identical, we will use an example of standard configuration of ZX1200i (203 DPI), 250 mm effective stroke AG4000T with standard 100x100mm applicator head and standard stand to guide you through the installation and make you familiar with the usage of the AG4000T print & apply solution. Further in this manual you find an option list.

4.2 Checking the box contents (AG-4000-400001)

Depending on the configuration you have ordered, it can be 2 or more boxes. Please check whether the boxes and their content has arrived undamaged. If you see any clearly visible damage on the outer cartons, please demand the courier to make a note about the damage and sign it before accepting the shippment. §4.2.1 and 4.2.2 will help you to check whether nothing is missing. Please inform your supplier immediately if anything seems to be wrong.

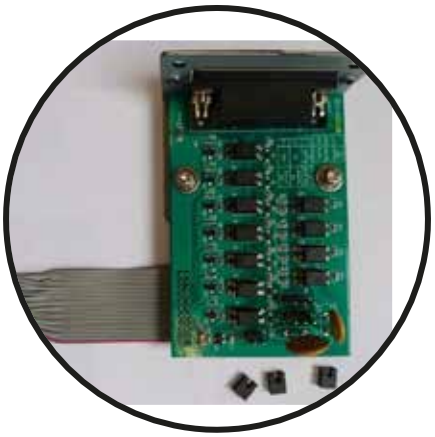
4.2.1 Box 1: Printer + Accessories

If you have received the printer parts for your AG4000T directly from a Godex subsidiary the printer box contains the printer components described below here. In case you have purchased the printer and options through a Godex distributor or dealer you may receive them in separate boxes. In that case it is also possible the internal rewinder and applicator interface have been pre- installed.
Due to simplicity, the illustrations below are depicted in different scales.

1x GoDEX ZX1200i 203dpi printer (optional: ZX1300i 300 dpi printer, ZX1600i 600dpi printer or ZX1200Xi 203 dpi, ZX1300Xi 300 dpi)

Pic. 10

1x GoDEX ZX1000(X)i GPIO interface board, item no. GP-031-Z2i003-001:



Pic. 11

1x GoDEX ZX1000(X)i peeler/rewinder unit, item no. GP-031-Z21005-000

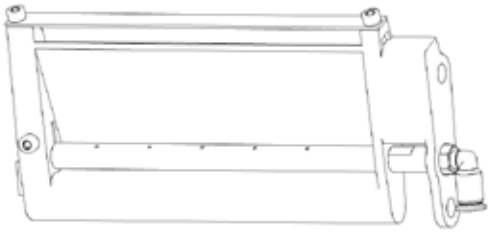
Pic. 12

4.2.2 Box 2: Applicator unit components

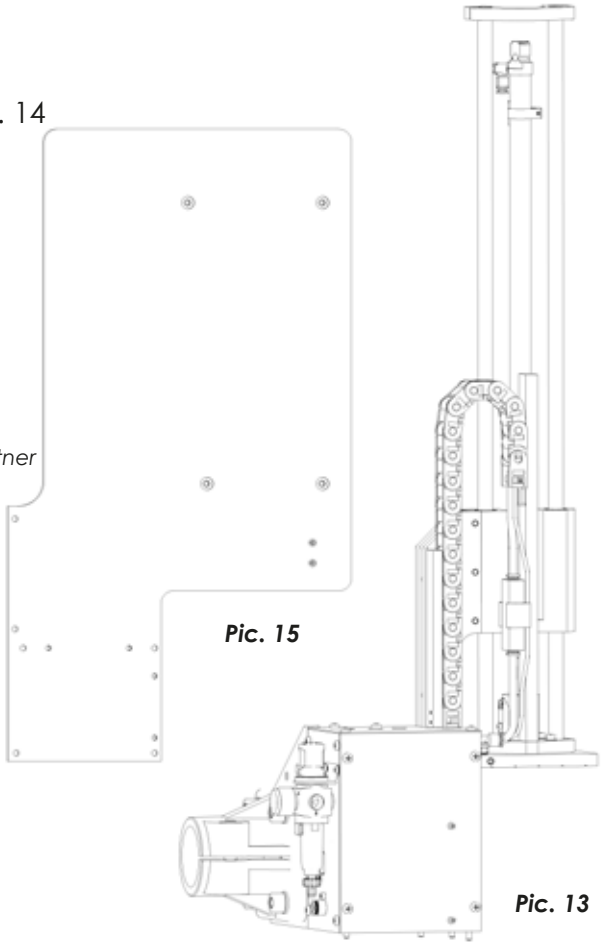
The package includes:

- 1 x AG4000T applicator unit Pic. 13
- 1 x AG4000T Base plate Pic. 15
- 1 x Dispenser module with air support unit Pic. 14
- 1 x Air support regulator valve Pic. 18
- 4 x Printer mounting adapter set (cylindrical adapter, screw, washer) Pic. 16
- 2 x screws for dispensing edge Pic. 17
- 6 x screws for fixing applicator unit to the base Pic. 20
- 1 x set screw ?? Pic. 19
- 1 x alarm beacon set (optional) Pic. 21

Depending on the configuration you have ordered there might be slightly different contents, please check with your local Godex Partner

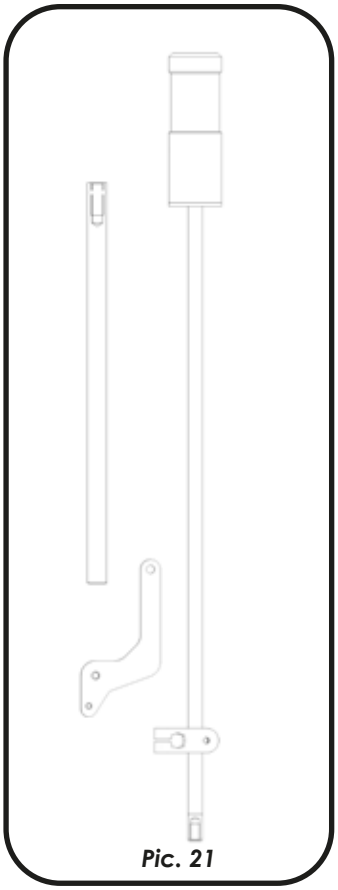


Pic. 14

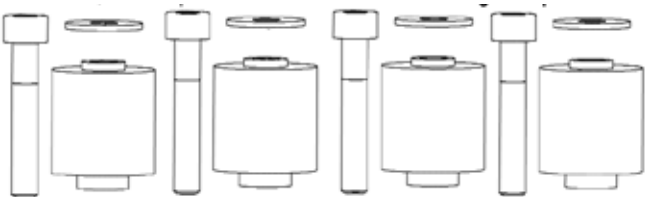


Pic. 15

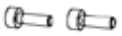
Pic. 13



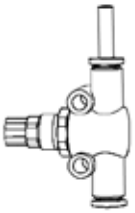
Pic. 21



Pic. 16



Pic. 17



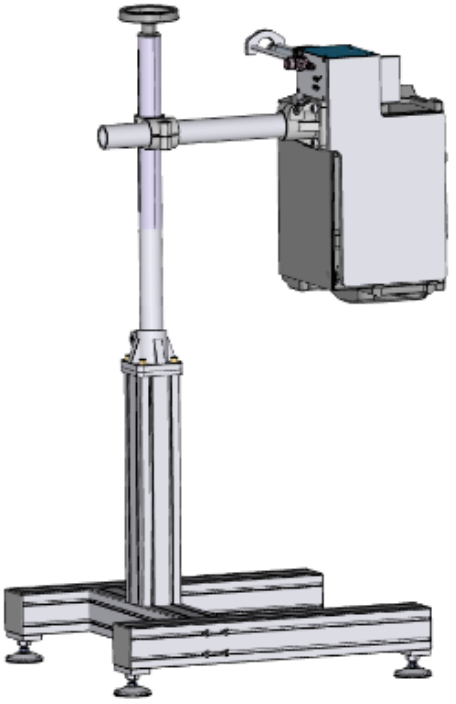
Pic. 18

Pic. 19

Pic. 20

4.2.3 Box 3: Stand components

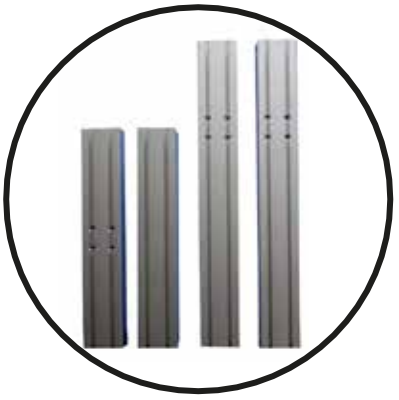
The illustration below show the stand configuration used for this example. Your Particular application may be different, but the principles are the same.



Pic. 22

In the box you will find assembly kit for the standard stand.

Pic. 23



Pic. 24

Pic. 25

5 Assembling the system

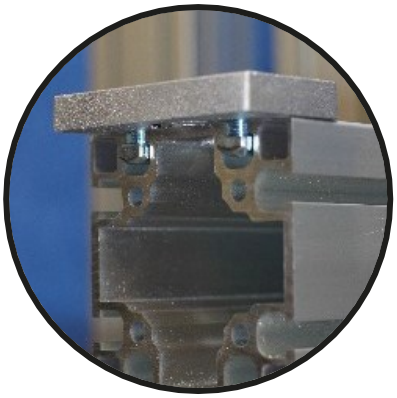
5.1 Required Tools

- Hex wrenches 4, 5, 6, 8
- Socket wrench 15
- Screwdriver set
- Phillips head screwdriver set

5.2 Assembling the stand

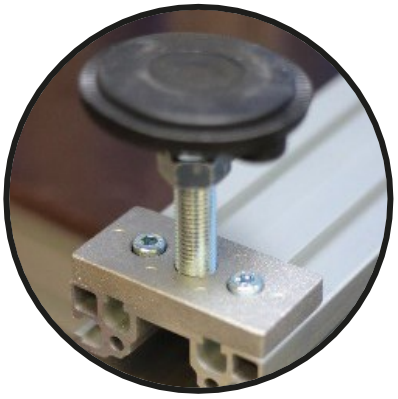
Please review all steps and parts described below here before you start assembling. It will help you to anticipate on every step to come.

Mount the four round feet to the corners of the 2 longer alloy profiles Pic. 26 - Pic. 28:



Pic. 26

Pic. 27



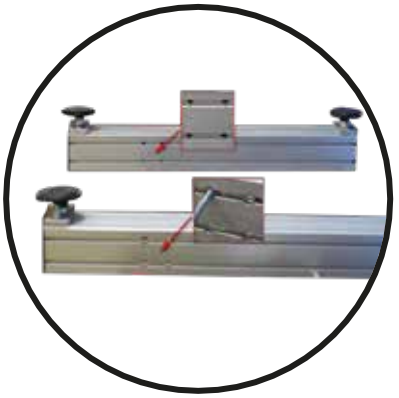
Pic. 28

Mount the feet on the side of the longer profiles which do not have screw holes Pic. 29

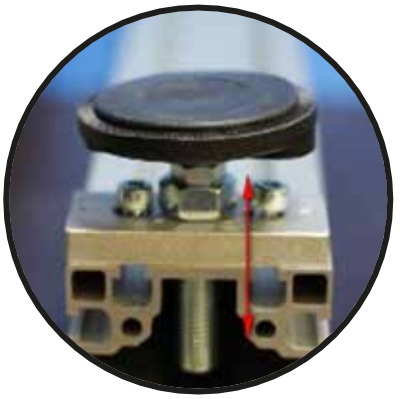
Let the narrow ends of the screw holes face each other on the inside whilst mounting the feet. Pic. 30

The height of each foot is adjustable individually to level the stand on uneven surfaces Pic. 31

Pic. 29



Pic. 30



Pic. 31

Close the ends of the alloy profiles with the black plastic covers Pic. 32

Place the shorter alloy profile (the one with holes on two faces in the middle) between the longer profiles. Make sure the wider ends of the screw holes are on the same side as the feet. Pic. 33

Pic. 32

Pic. 33

Firmly connect the three legs with screws Pic. 34 and Pic. 35.

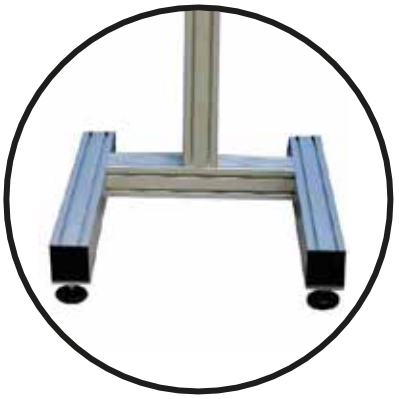
Pic. 34

Pic. 35

Take the remaining profile (Pic. 36) and mount it firmly with screws onto the central profile:

Pic. 36

Pic. 37



Pic. 38

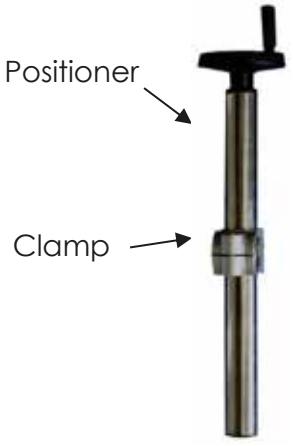
Mount the adapter plate and clamp on the top of the vertical profile.

Pic. 39

Pic. 40

Pic. 41

Mount the cross clamp onto the slide inside positioner (tube with thread and wheel to turn) and then mount the positioner in to the floor stand:



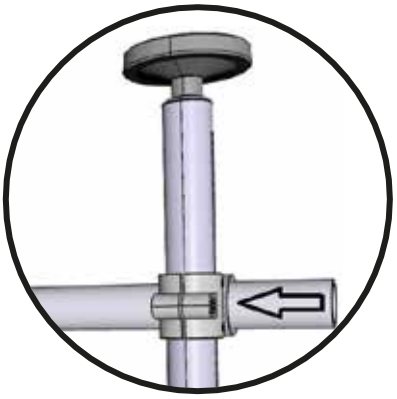
Pic. 42

Pic. 45

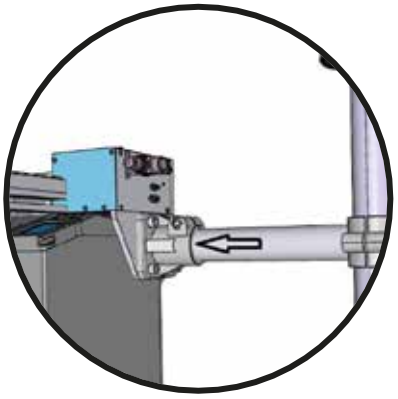
Pic. 43

Pic. 44

Mount the tube in to the cross clamp Pic. 46.
At a later stage the end of the tube must be inserted in - and firmly attached to clamp on the applicator by tightening the screw Pic. 47.



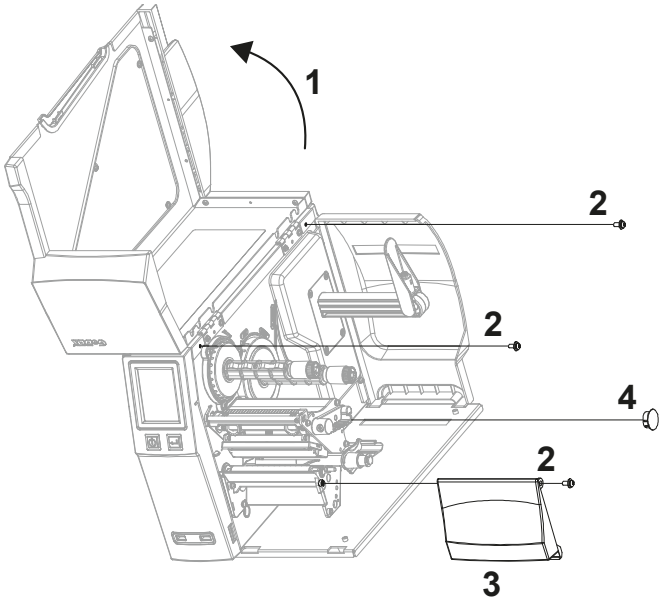
Pic. 46



Pic. 47

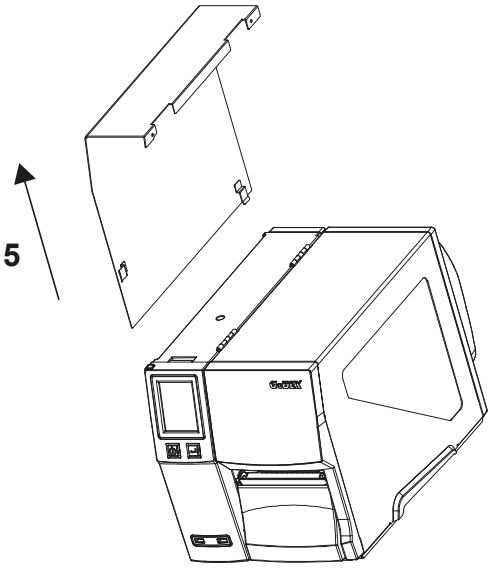
5.3 Installing the internal rewinder and GPIO card in the printer

(Does not apply if you ordered preconfigured system)

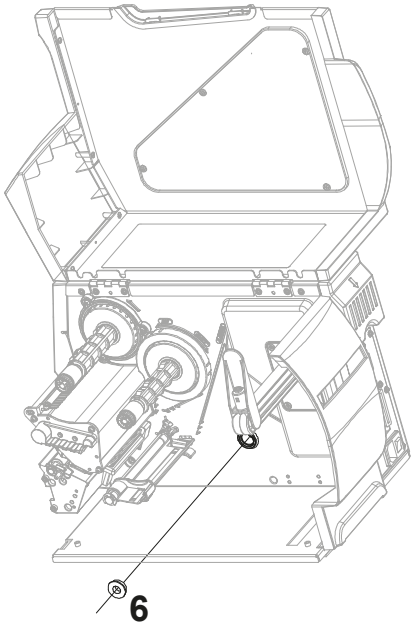


Pic. 48

1. Open the printer door (Pic. 48)
2. Remove the screws (Pic. 48)
3. Remove the plastic panel (Pic. 48)
4. Remove the plastic cap (Pic. 48)
5. Remove the left cover (Pic. 49)

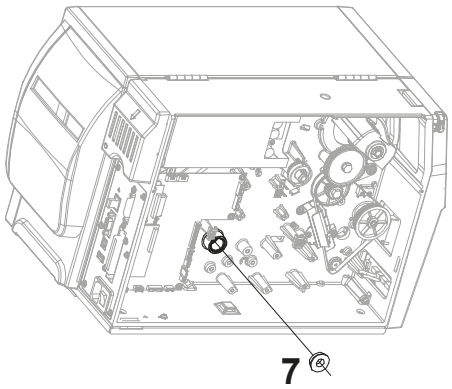


Pic. 49

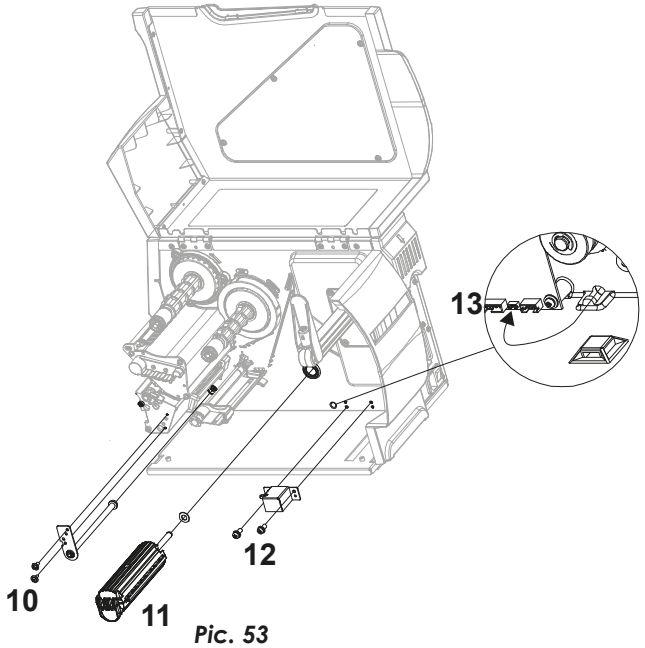


Pic. 50

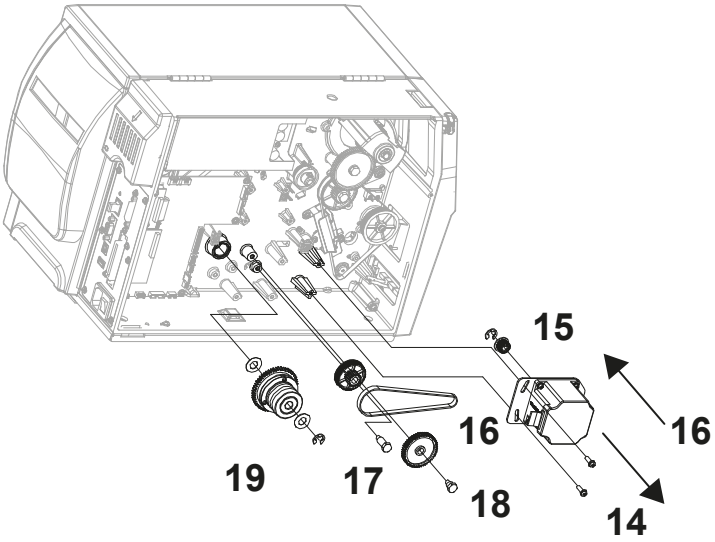
6. Insert the bearing (Pic. 50)
7. Insert the bearing (Pic. 51)



Pic. 51



Pic. 53

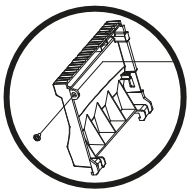


Pic. 55

Steps 8 and 9 are omitted as they are irrelevant for the AG4000T application.

The panel with label taken sensor that comes with the internal rewinder kit Pic. 52 is not needed for this application.

Please continue from step 10.

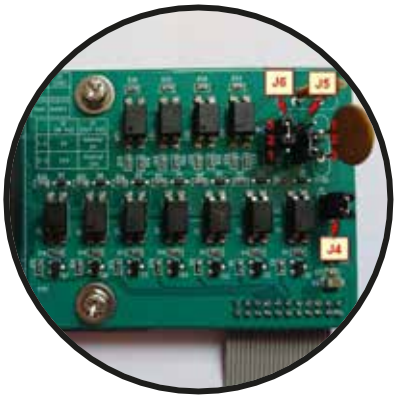


Pic. 52

10. Install roller kit (Pic. 53)
11. Install backing paper rewind shaft. (Pic. 53)
12. Install *Rewinder full* switch (Pic. 53)
13. Connect the switch connector to the mainboard of the printer (Pic. 53)
14. Remove the motor (Pic. 55)
15. Install 22t gear and retaining ring on to the motor shaft (Pic. 55)
16. Reinstall the motor back and tighten the toothed belt (Pic. 55)
17.-18. Install the gear kits. Lubricate the metal rods/screws that holds the gears with silicone oil (Pic. 55)
19. Install clutch kit. (Pic. 55). *The torque setting from the factory of the clutch is suitable for the AG4000T application. In case the torque setting would need to be adjusted at some point, please refer to the printer service manual.*
20. Remove the metal cover on the back side of the printer (Pic. 54 and Pic. 56)
21. Inspect the jumpers J4, J5, J6 on the GPIO board (Pic. 57). J4 should be connected, J5 – pins 2-3 connected, J6 – pins 2-3 connected. **Incorrect jumper configuration can damage the device.** *For more information about the GPIO board and I/O signals please refer to Annex 1*

Pic. 54

Pic. 56



Pic. 57

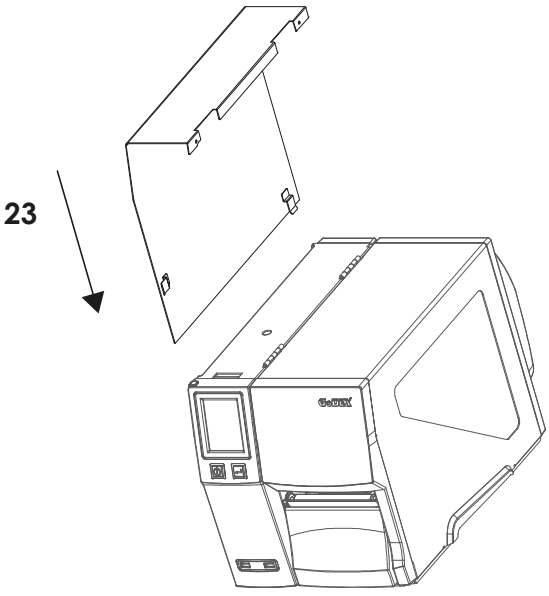
Pic. 58

Pic. 59

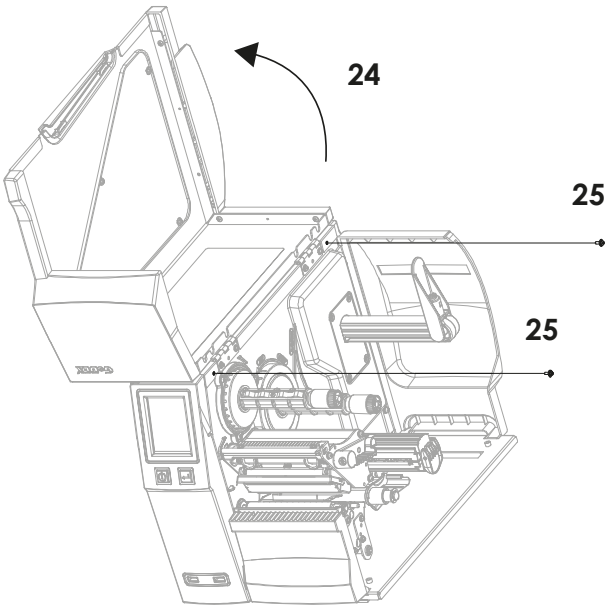
Pic. 60

22. Connect the GPIO board connector to the printer mainboard (Pic. 58 and Pic. 59) and install the board (Pic. 60). Fix the board from the back side of the printer with screws (Pic. 61).
23. Reinstall the left cover (Pic. 62)
24.-25. Open the printer door and reinstall the screws (Pic. 63)

Pic. 61



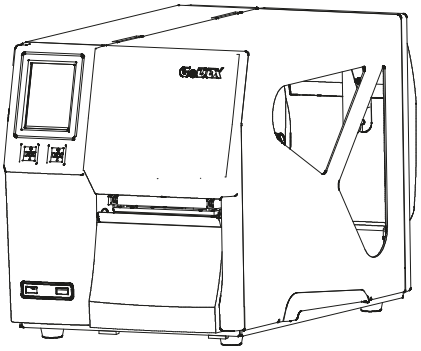
Pic. 62



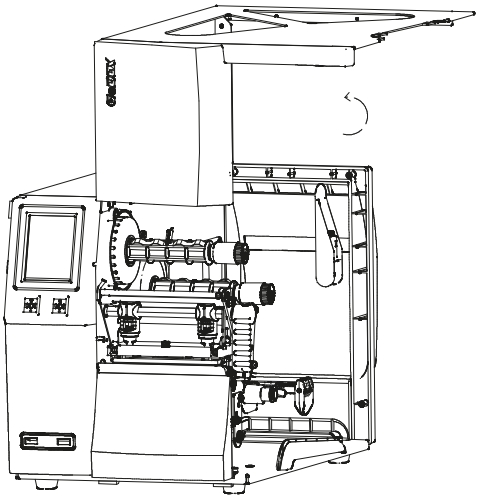
Pic. 63

5.4 Installing the label dispensing edge

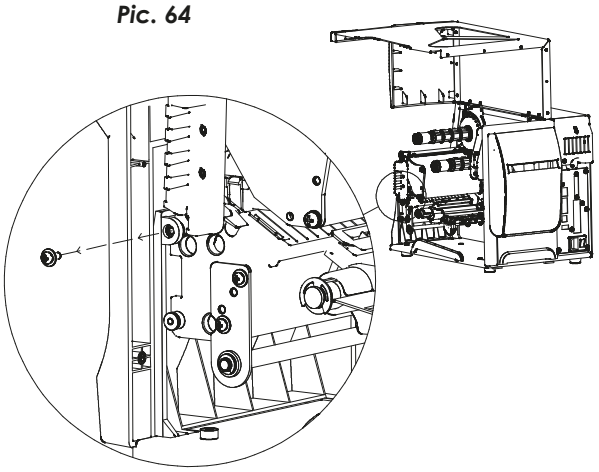
Remove the bottom right cover/panel. *(If you needed to complete steps in Paragraph 5, start from Pic. 69)*



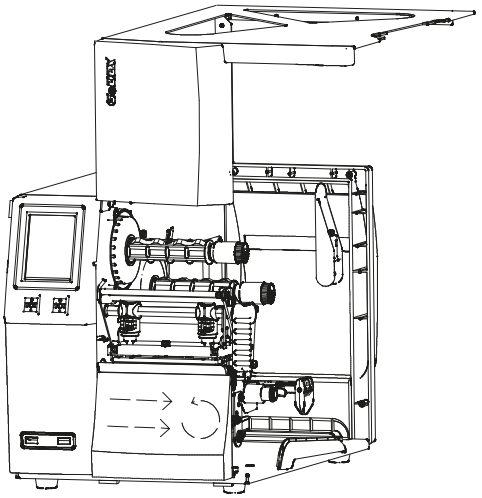
Pic. 64



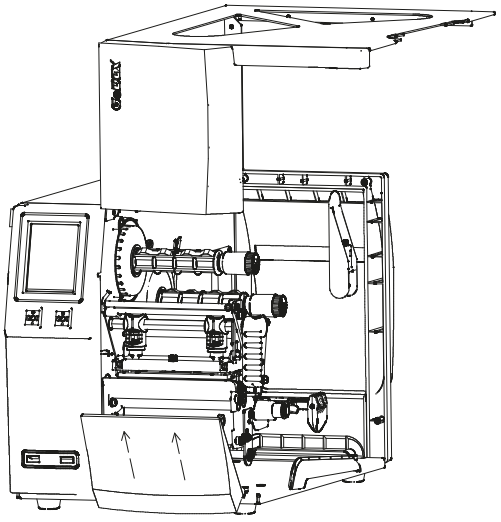
Pic. 65



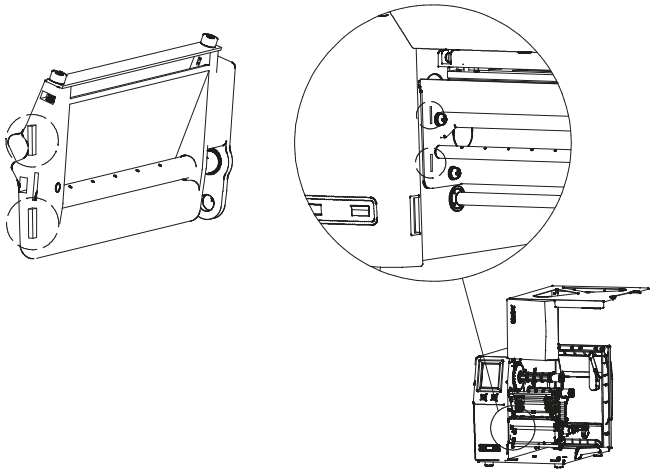
Pic. 66



Pic. 67

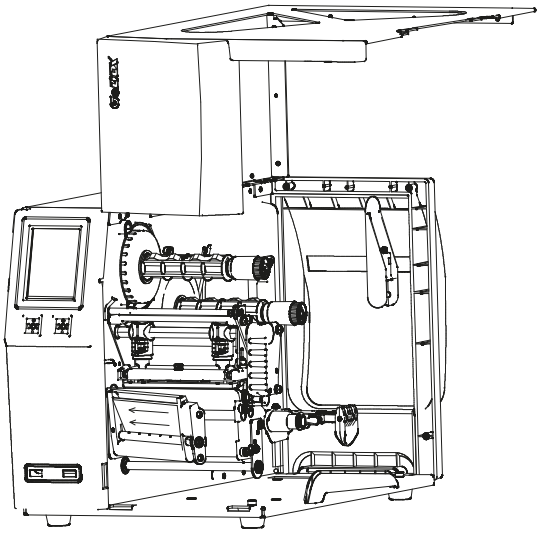


Pic. 68

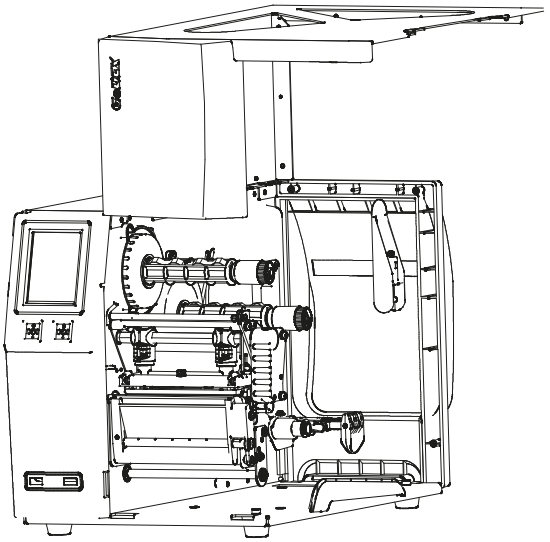


Pic. 69

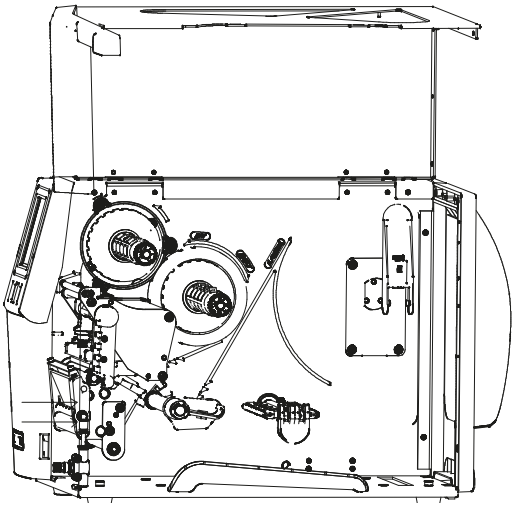
Pay attention to the cutouts and fixing points Pic. 69 and install the dispensing edge into the printer Pic. 70, install the air valve and tube to the dispensing edge Pic. 72. Fix the dispensing edge with the screws Pic. 74.



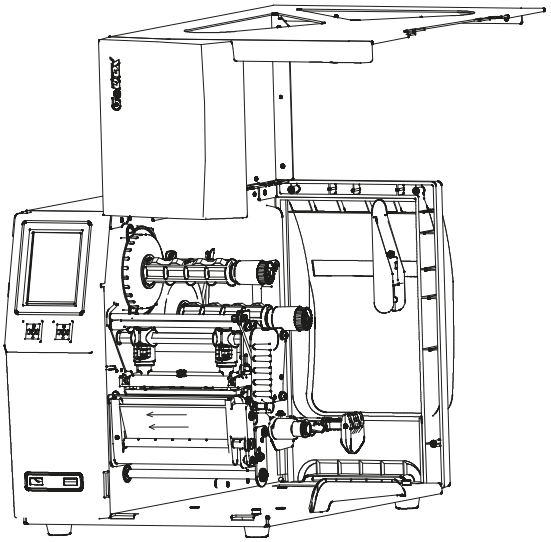
Pic. 70



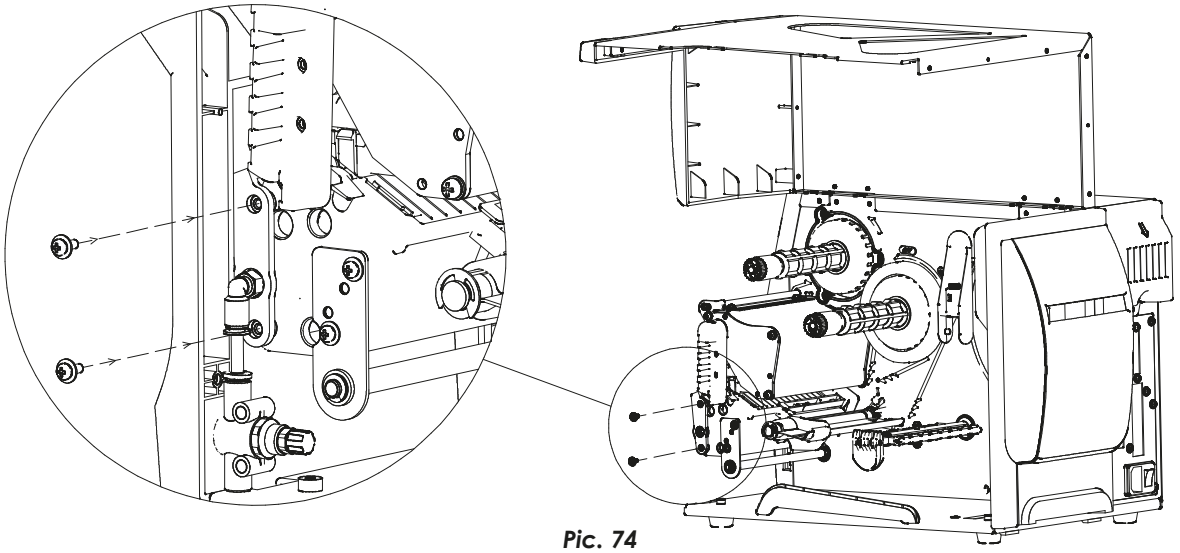
Pic. 71



Pic. 72



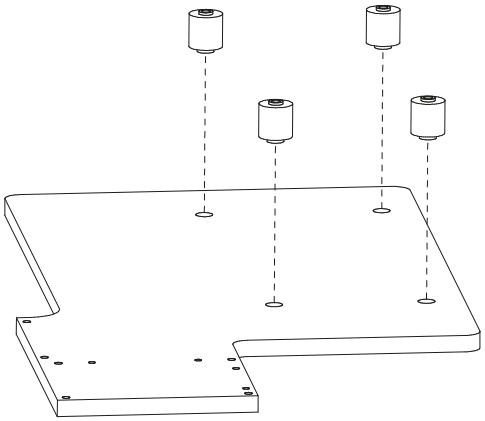
Pic. 73



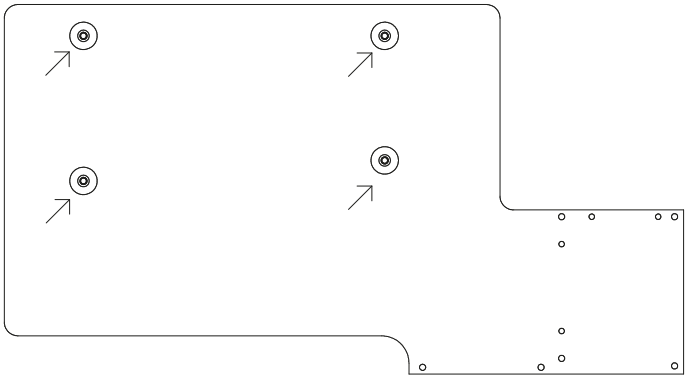
Pic. 74

5.5 Assembling the applicator unit

5.5.1.1 Slide the printer mounting adapters into the holes of base plate (cylindrical metal parts) as shown in Pic. 75 and Pic. 76. At a later stage you will need to fix them with screws, right now simply slide them in.

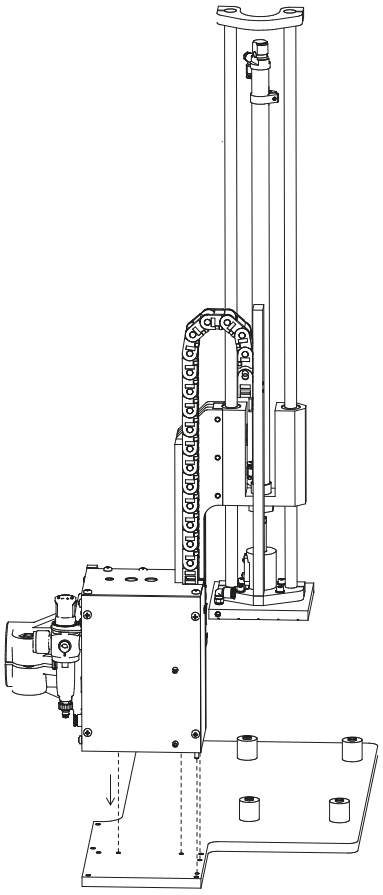


Pic. 75

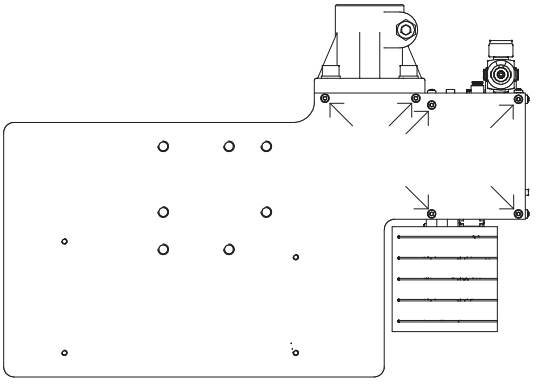


Pic. 76

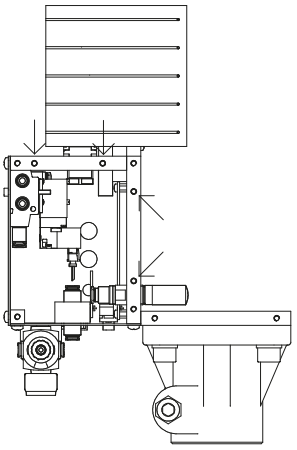
5.5.1.2 Attach the applicator unit to the base plate Pic. 77. Please pay attention to the mounting points and fixation rods Pic. 78 and Pic. 79. Fix the applicator unit to the base plate with screws from the bottom side Pic. 80.



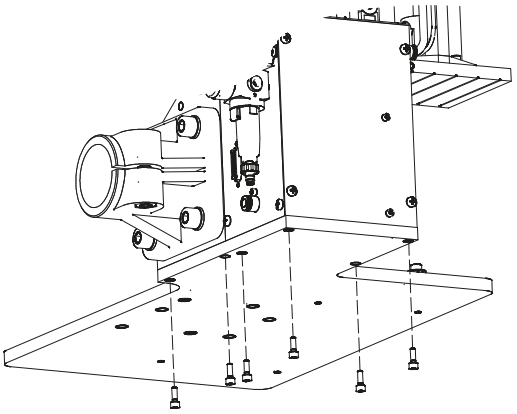
Pic. 77



Pic. 78

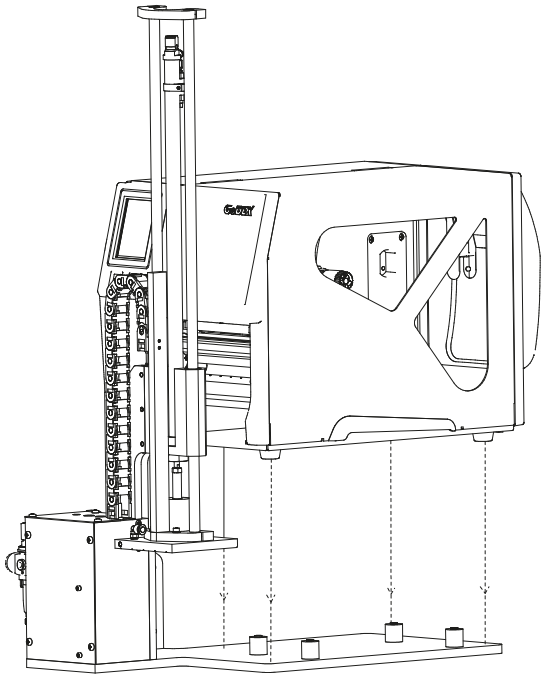


Pic. 79

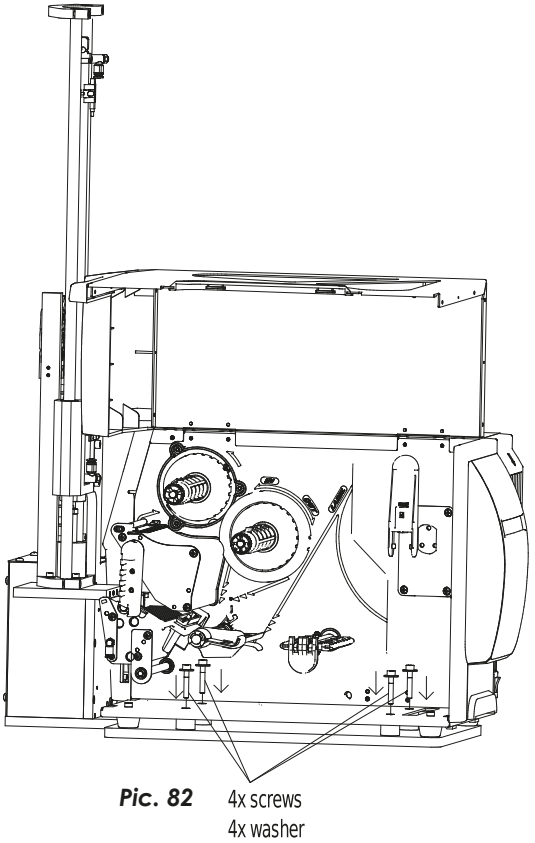


Pic. 80

5.5.1.3 Install the printer onto the base plate. The holes on the printer bottom plate should fit into the printer mounting adaptors Pic. 81. Fix the printer with screws (use washers) to the base plate. The screws should go through the printer mounting adaptors Pic. 82.

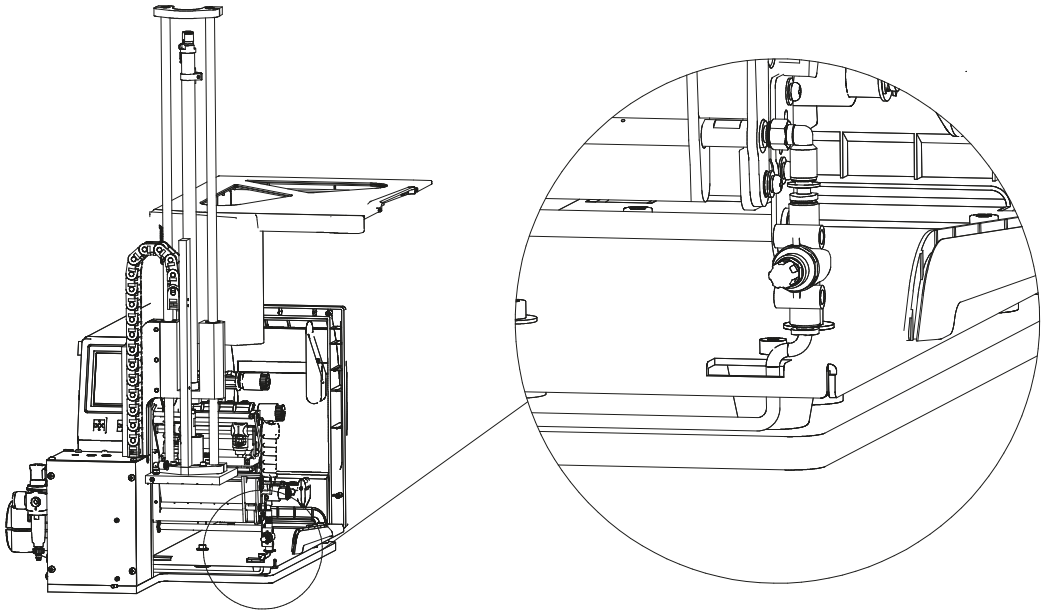


Pic. 81



Pic. 82

5.5.1.4 Connect the support air valve to the air pipe from the applicator unit. Applicator system assembly is completed and you can mount the unit onto the stand, for this particular example configuration refer to Pic. 47.



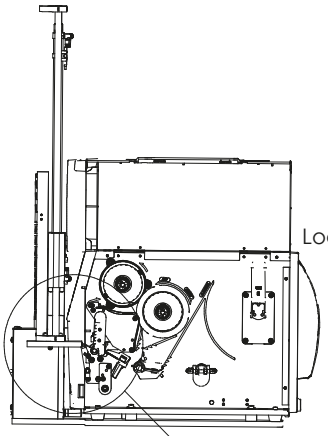
Pic. 83

6 Applicator unit adjustments. Fine tuning.

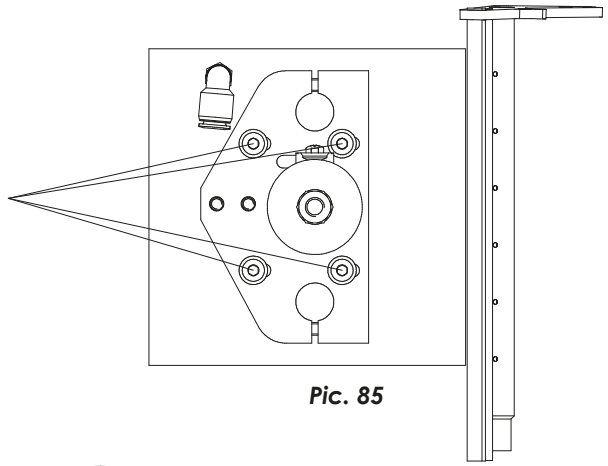
All machines come preconfigured from the factory. However, depending on the application, you might need to make the adjustments/fine tuning of the mechanisms.

6.1 Adjusting the applicator head distance from the dispensing edge

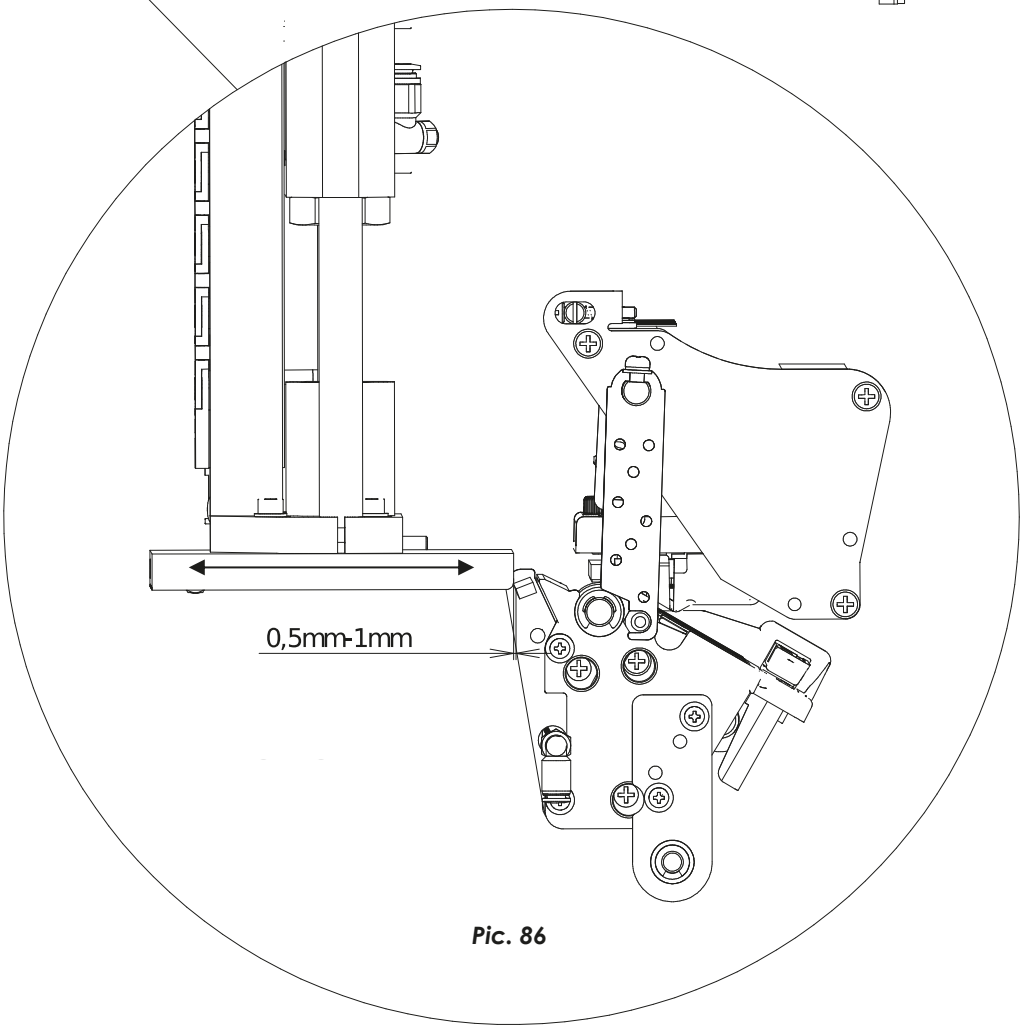
Distance between the dispensing edge and the applicator head should be in limits of 0.5 mm – 1 mm. In order to adjust this distance, you need to open the printer door Pic. 84 loosen the 4 screws holding the applicator head Pic. 85, set the right distance Pic. 86 and retighten the screws.



Pic. 84



Pic. 85

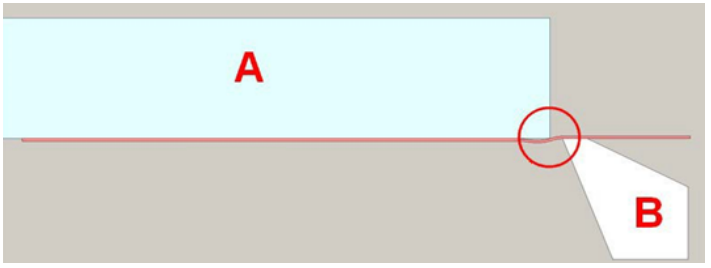


Pic. 86

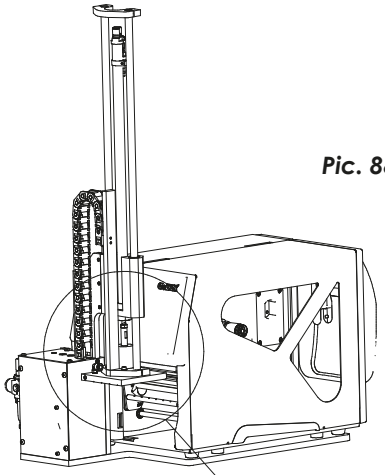
6.2 Adjusting the applicator head vertical resting position

The applicator head (A) bottom surface should be nearly in the same height as the dispensing edge upper surface (B). When the height is set correctly, the label will slightly bend while traveling onto the applicator head, see the red circle in Pic. 87.

Release the counter nut Pic. 89
Adjust the height Pic. 88
Retighten the counter nut Pic. 89

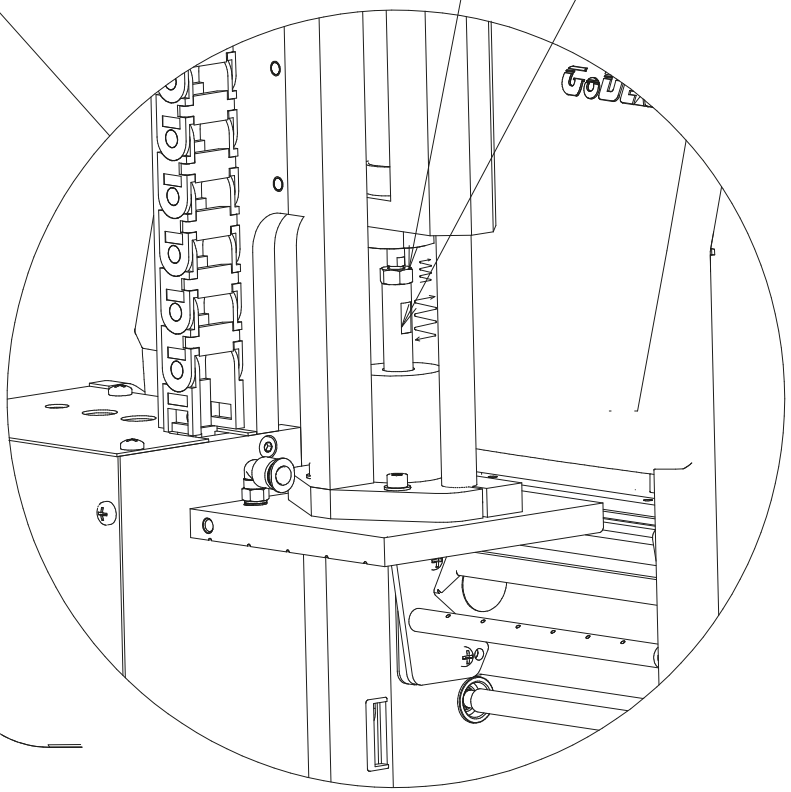


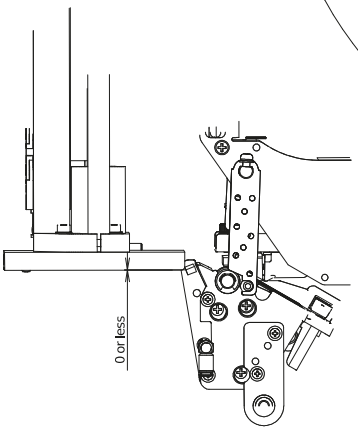
Pic. 87



Pic. 88 You can adjust the height of the applicator head by turning piston rod

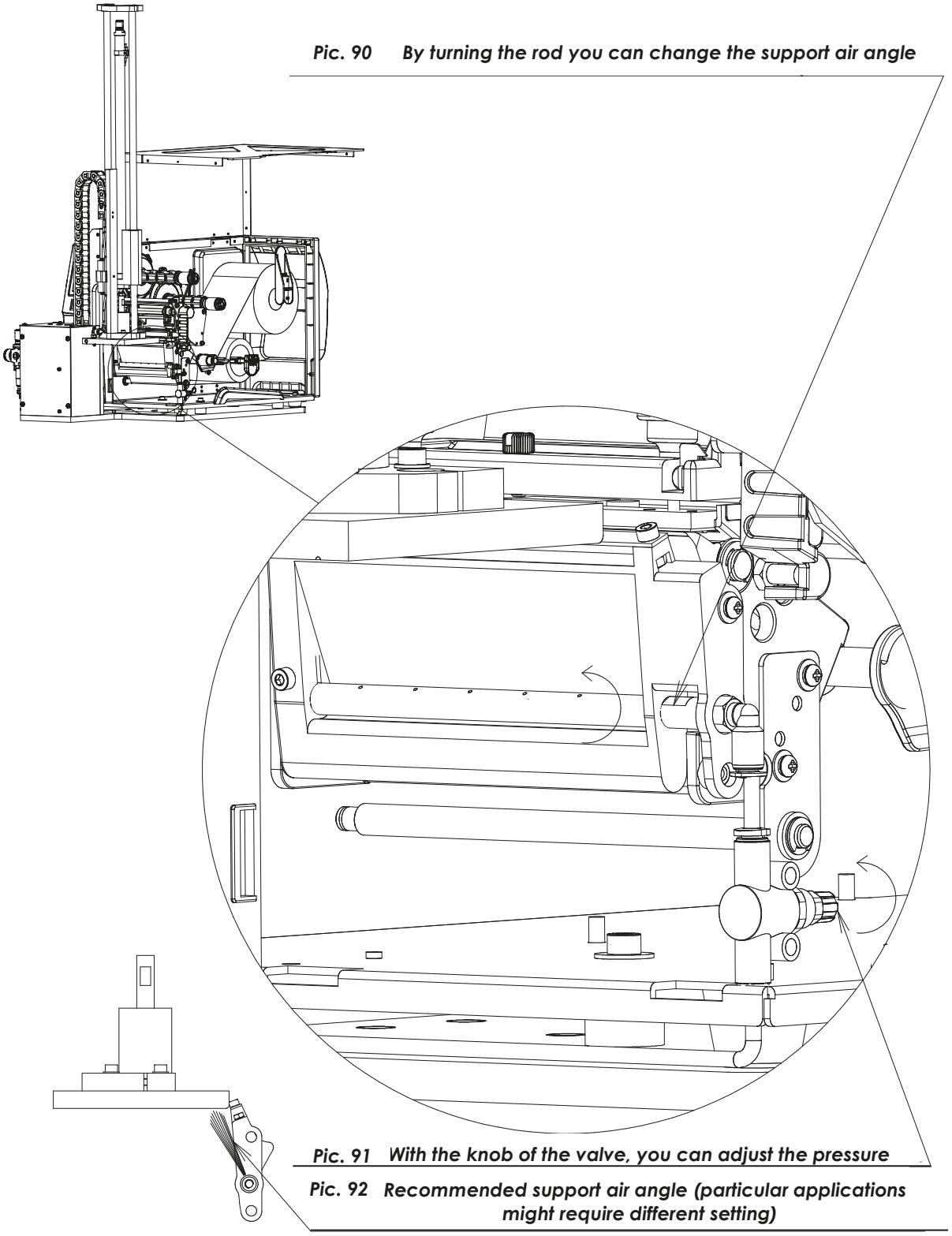
Pic. 89 Counter nut





6.3 Adjusting the support air angle and pressure

Support air ensures that the dispensed label will be "caught" by the vacuum of the applicator head and at the same time helps to move the label forward on to the label pad.
Depending on the application, you might need to adjust the support air pressure or angle of the air flow to the dispensed label. You can change the angle by turning the rod with nozzles Pic. 90. The pressure can be adjusted with the knob on the pneumatic valve Pic. 91. The most common support air angle is shown in Pic. 92 (please note that some particular applications might require different setting).



Pic. 90 By turning the rod you can change the support air angle

Pic. 91 With the knob of the valve, you can adjust the pressure

Pic. 92 Recommended support air angle (particular applications might require different setting)

7 Operating your AG4000T

7.1 Print & apply cycle: the basics

Print and apply cycle consists of two operations – printing and applying the label on to the product. In most of the cases both of these operations happen one after another directly, that means, we print the label and apply it directly.
When the cycle is initiated, the printed label is being dispensed right at the exit of print mechanism and it travels onto the applicator head pad. Applicator head pad provides vacuum to keep the label on the pad. Below the dispensing edge there is support air nozzles that blow air from the bottom side in an angle to the dispensed label in order to push it towards the label pad and at the same time, the air blowing in an angle helps to move the label forward on the applicator head. Once the label is fully on the applicator head, printer provides the applicator unit a signal that label is fully printed and application cycle begins – the piston travels down until it meets the product, piston has a touch sensor, so when the touch sensor traces a contact with the product, the arm goes back to the resting/printing position.

7.2 Printer configuration for applicatoruse

7.2.1 Power on the system

1. Connect the compressed air pipe to the main valve. ***Careful*** the piston will retract after the air is connected. Pic. 94 Required air pressure for normal operation is ~5 bar.
2. Connect the GPIO cable from the applicator unit to the printer on the printers GPIO Module DB15 socket. Picture missing
3. Connect the power cable into a 240V AC socket (applicator unit is powered from the GPIO interface of the printer).
4. Switch on the main switch on the back of the printer. Pic. 93
5. Push the power button beneath the printer display Pic. 95

Pic. 93

Pic. 95

Pic. 94

7.2.2 Setting the printer to the right GPIO Mode and Applicator setting lock

Godex printers support few different GPIO signal modes *(for more information refer to Annex 1)*, AG4000T Applicator unit uses the Mode1. Also the applicator option setting must be turned on in the printer settings. It can be either sent together with the printjob, or it can be set and locked permanently.

In order to enable correct and reliable communication between the applicator unit and the printer, you **must** set the right GPIO mode and enable applicator setting. The procedure can be done by sending these commands (e.g. with GoDoctor):

^XSET,APPLICATOR,0,1
^O2
^XSET,LOCKCMD,0040

Alternatively you can toggle the lock of the Applicator setting (**only setting**) via LCD interface: Select *Main* Pic. 96, then *Device* Pic. 97 , then *Option Setting* Pic. 98.

Pic. 96

Pic. 97

Pic. 98

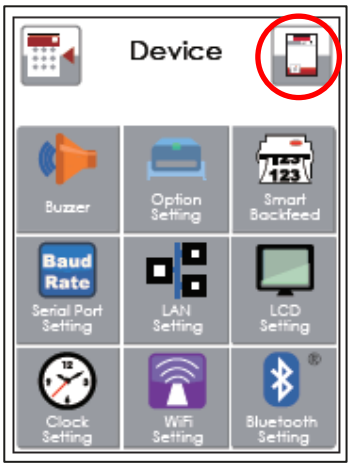
Click "+" on the right side near the "Option" until "Applicator" will be shown Pic. 101. Click on the "Lock" near the setting on the left side to "Lock" the setting Pic. 99. This "Lock" will set printer to applicator mode independent on the setting coming with the label format. Confirm with OK button Pic. 100. The Smart Backfeed function should be turned off.

Pic. 101

Pic. 99

Pic. 100

Go back to the “Ready” screen:

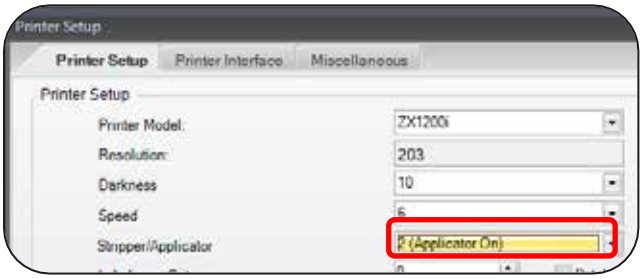


Pic. 102

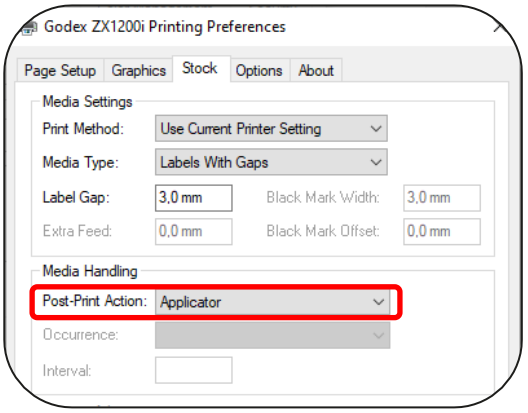
Pic. 103

7.2.3 Creating label format and loading media

Create the label format with Label Design SW (e.g. GoLabel) as usually. Always select the applicator mode in either the software (Pic. 104 GoLabel) or the driver (Pic. 105 Seagull Driver) you are using.



Pic. 104



Pic. 105

Load the printer with suitable media and TTR if applicable. The printer is ready to go now. For more information regarding creating labels and handling the ZX printer, please refer to the printer user manual.

8 Connecting to auxiliary systems

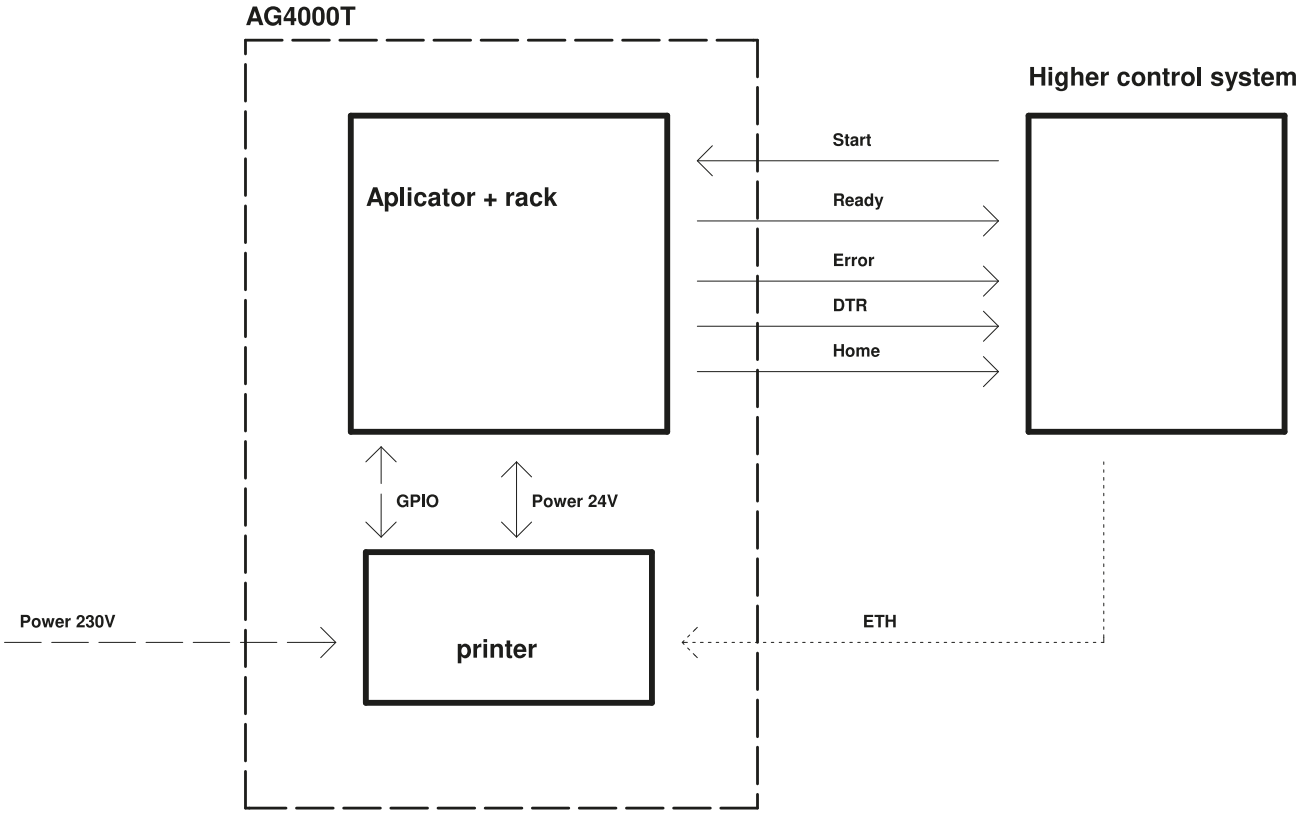
8.1 Introduction

The AG4000T applicator solution can be integrated in any hard and software environment as long as the GoDEX ZX1X00i printer is compatible with that environment as well. However, the communication lines between the printer and any auxiliary system and between the applicator unit and such system are fully separated. Also the kind of information which is exchanged differs:

1. The printer will receive print data (content and settings) from the system through one or more of its interfaces and can send certain status and error data via the same interfaces. The communication can take place in various printer languages, the commands being generated by drivers, label software or the auxiliary system itself. See the printer documentation for detailed information.
2. The applicator unit will receive start signals from the auxiliary system and can report certain status and error signals back to that system.

A schematic depiction of an AG4000 integrated in a higher control system (e.g. an ERP system) is given in Pic. 106. The chosen Ethernet is just a random example of how data can be exchanged between printer and such auxiliary system.
Examples how to connect the AG4000T applicator unit to the most common kinds of auxiliary systems, starting with the auxiliary system as a triggering device are explained below.

Communication between printer, applicator and system:

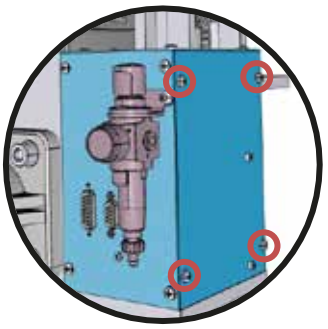


Pic. 106

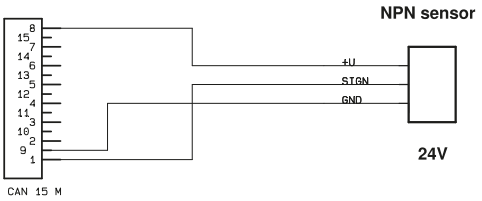
8.2 Operation modes

The print & labelling cycle can be initiated either by printer receiving the print job (***direct mode***) or by external trigger (***trigger mode***).
In case of ***direct mode***, the printer start the print & apply cycle immediately after receiving the print job from external system (PLC, PC or other). This mode is often used to label products with unique labels that contain unique data meant for a particular product. The timing when the printjob is being sent should be determined by the external system.
In case of ***trigger mode***, the print & apply cycle is being initiated by an external trigger such as photo sensor, button or similar. When using this mode, the printer must have the printjob already in the buffer before the trigger signal comes. This mode is suitable for batch labelling. Given that the printjob is already in the printer buffer, label is being printed and applied when the trigger signal is provided to the applicator unit.

Toggle between ***direct mode*** and ***trigger mode***.
In order to change the mode, you need to open the applicator unit cover Pic. 107 and either put or remove a jumper from the contacts. See also Pic. 110.
Direct mode is active when the jumper is on the below shown contacts on the mainboard of the applicator unit. ***Trigger mode*** is active when jumper is removed.

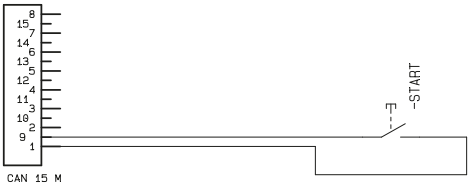


Pic. 107



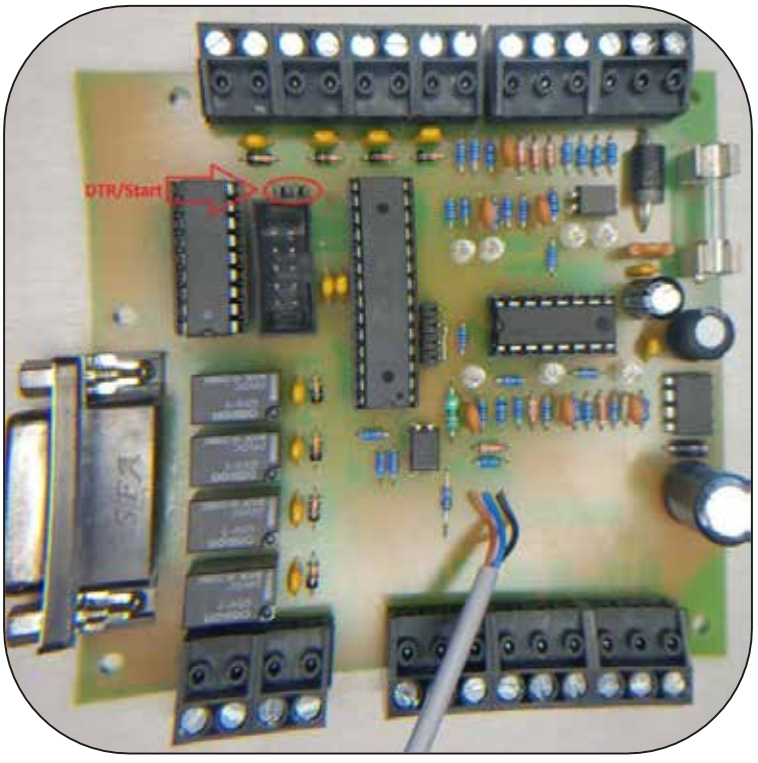
Pic. 108

Trigger mode NPN sensor using internal 24V power.



Pic. 109

Trigger mode button.

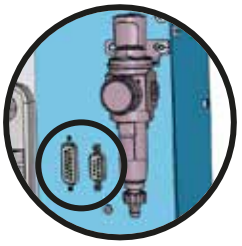


Pic. 110

Direct / Trigger mode toggle. See in Pic. 110 red circled area. If the jumper is on, the direct mode is active, if there is no jumper, trigger mode is active.

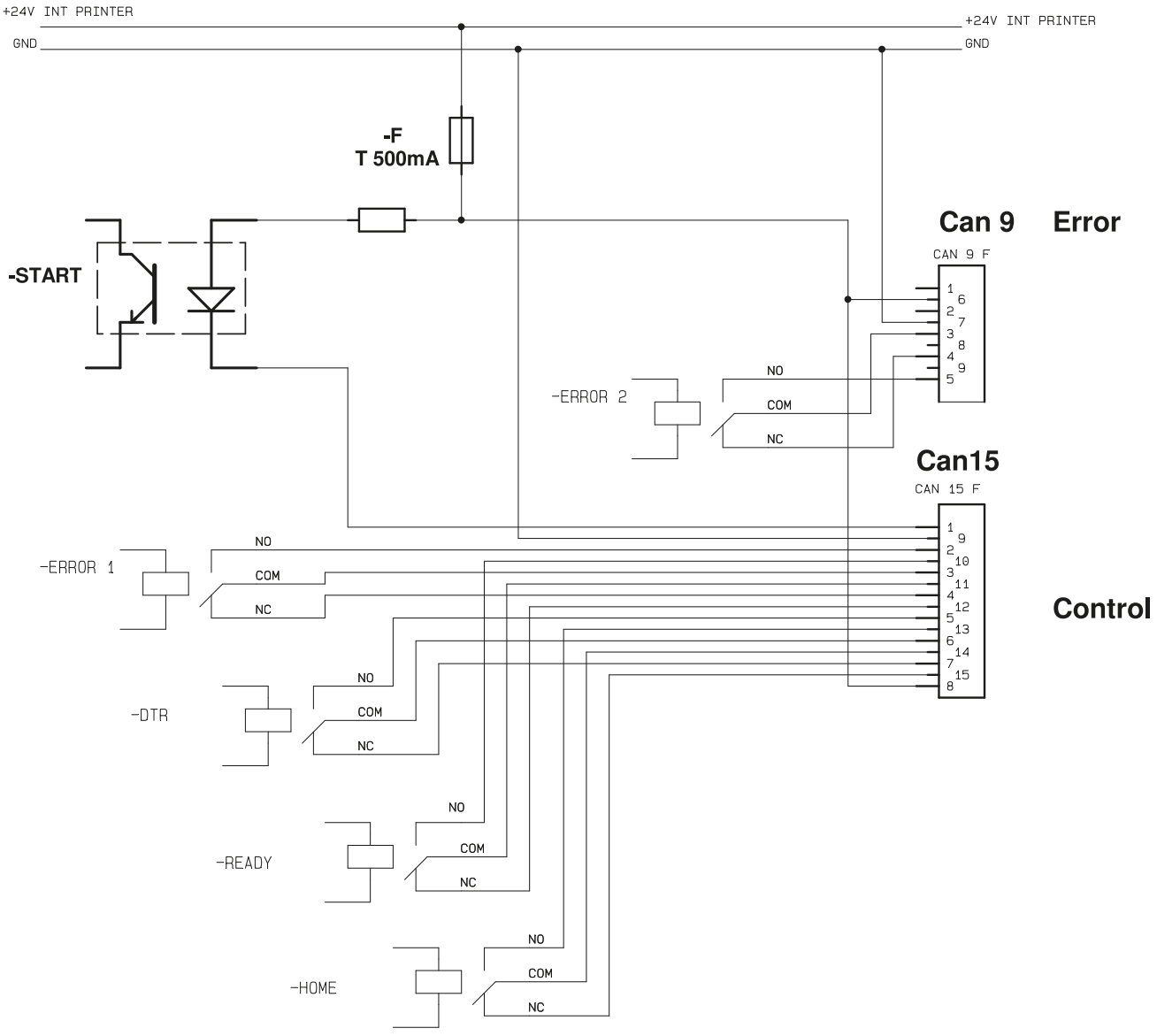
8.3 Inputs and Outputs

The triggering device can be a manual start button, a sensor on a conveyor line, a switch which is automatically activated when a product is placed onto it, an external PLC built in a robot, a PLC ultimately controlled by an ERP system, et cetera.



Pic. 111

Below is the diagram of the GPIO of the AG4000T general inputs and outputs. The two connectors (DB9 and DB15) are on the left side of the machine, see Pic. 111.
In Pic. 112 you can see the electrical scheme.

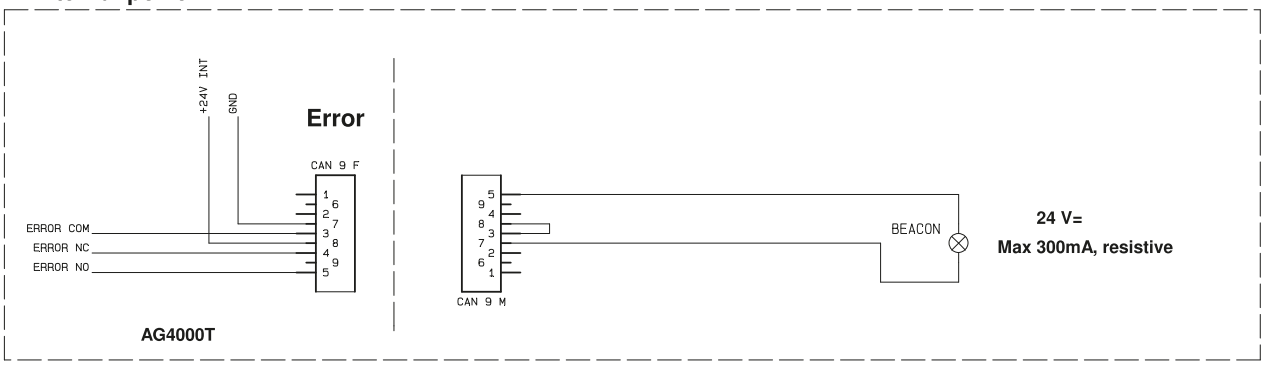


Pic. 112

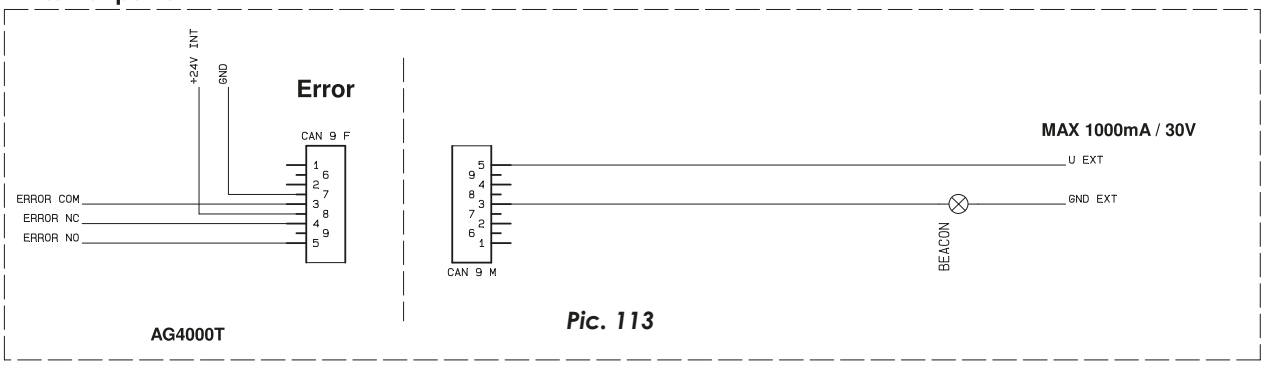
8.3.1 Outputs

DB9 provide error output that can be used for signaling errors.

Internal power



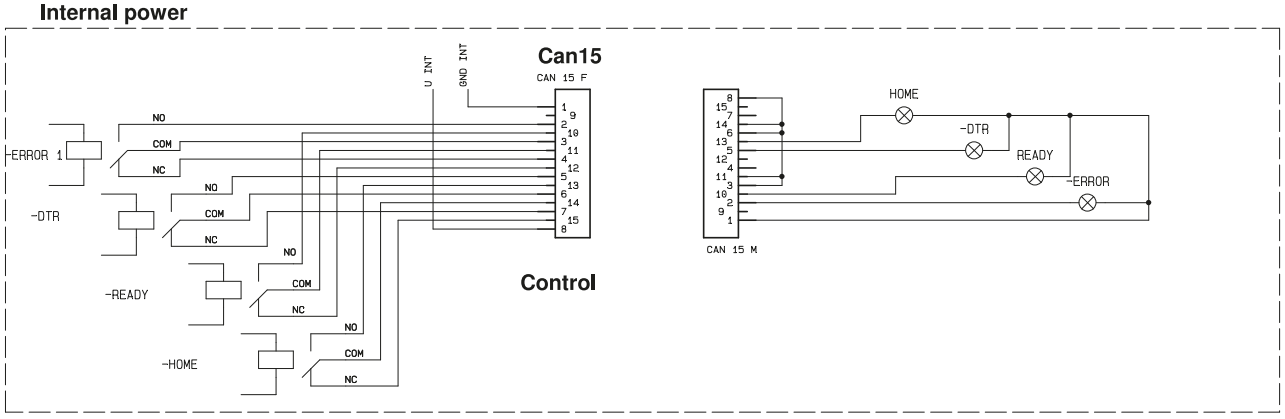
External power



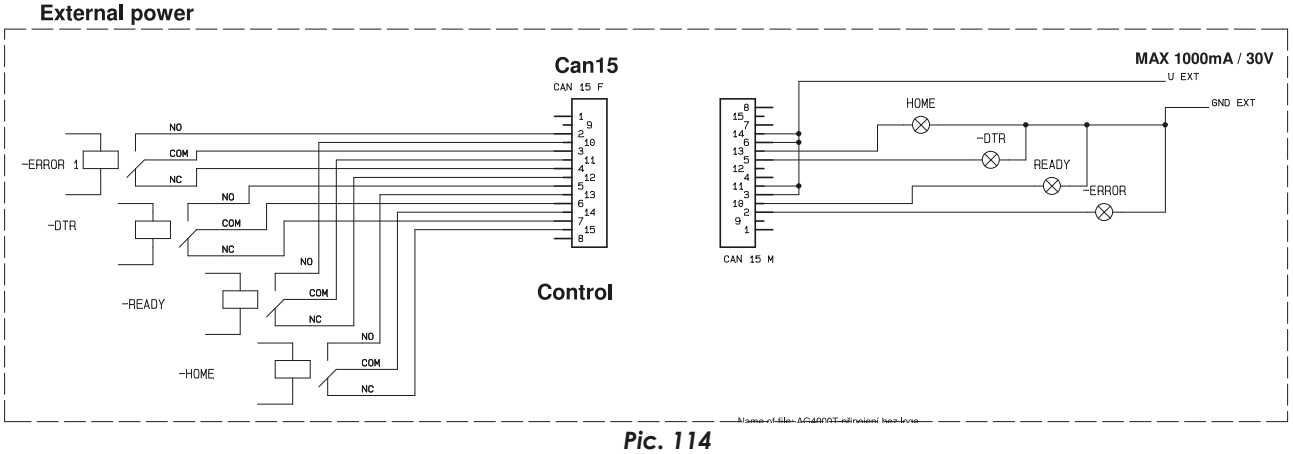
Pic. 113

DB15 Provides additional outputs such as Data Ready, Ready, Home position.

Internal power



External power

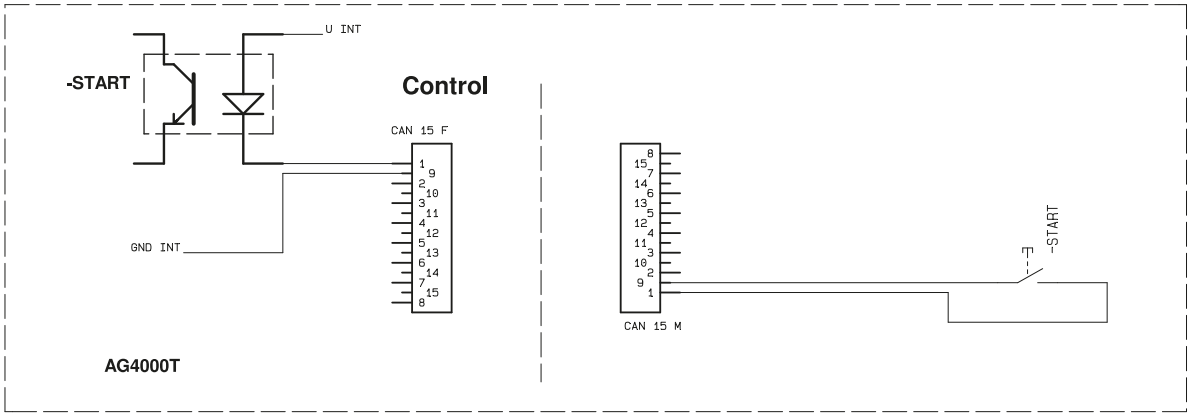


Pic. 114

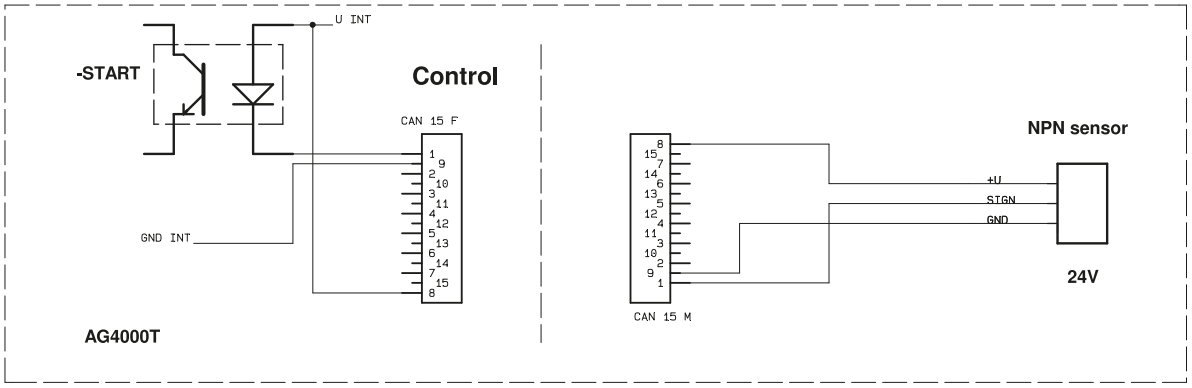
8.3.2 Inputs

DB15 provide inputs for triggering devices. ! **Important !** The Applicator unit should be in Trigger Mode

Contact NC



Sensor NPN



Pic. 115

9 Maintenance

AG4000T systems require hardly any maintenance, which goes for both the printer and the applicator components. For applicator maintenance instructions please see the "AG4000T Maintenance & Options Guide" and for printer maintenance instructions the "ZX1200i Service Manual". Both are made available to authorized GoDEX dealers

Also needed some basic Troubleshooting

10 **Annex 1** ZX1000i printer GPIO (General Purpose Input Output) module functions

FW versions V2.Y2Y and up
Applicator modes: Mode (1-4)

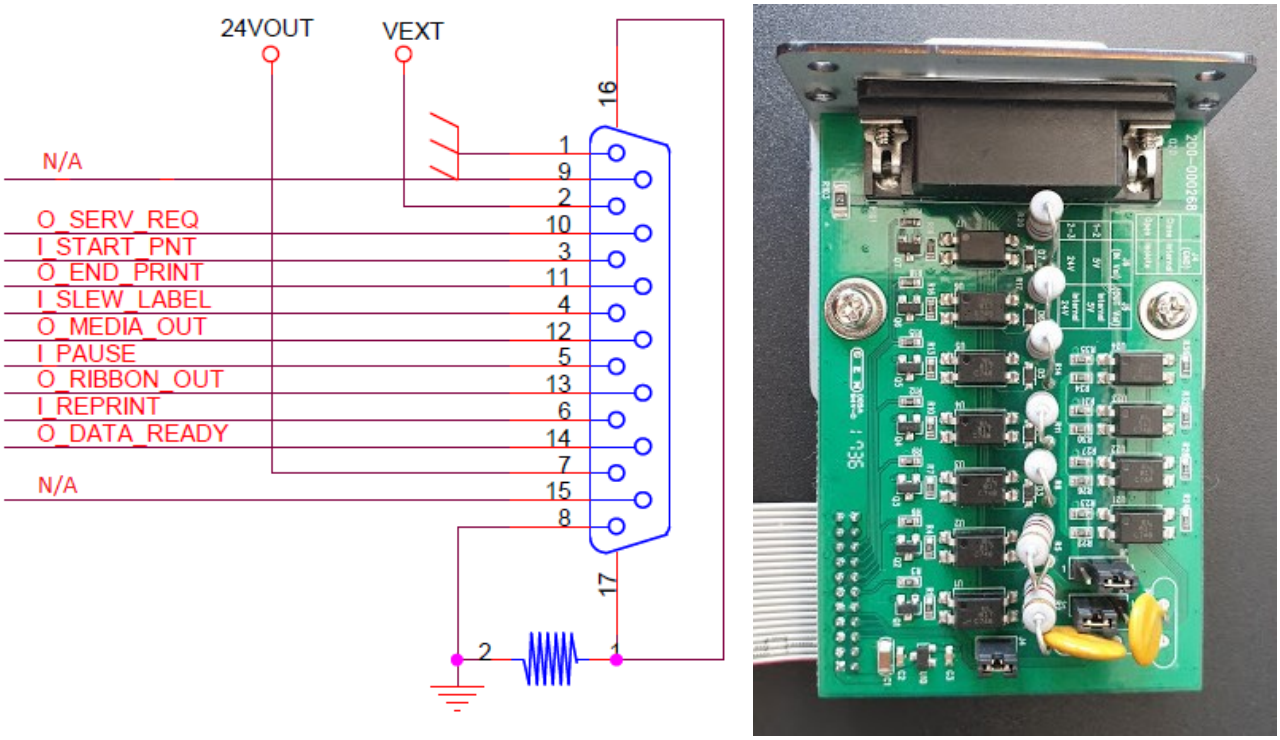


Figure 1 GPIO board pinout and physical layout

GPIO interface is a discrete interface designed for communication between devices (e.g. use with automatic label applicator; trigger printing by photo sensor or PLC; provide fault signals from printer to peripheral system (traffic lights, etc.) and other applications involving peripherals). ZX1x00i Applicator interface support several operation profiles (modes).

GPIO interface has DB15 female connector, which contains these opto-coupled inputs and outputs:

- 4 inputs: START PRINT (trigger), FEED, PAUSE, REPRINT
- 5 outputs: SERVICE REQUIRED, END PRINT (printing), MEDIA OUT, RIBBON OUT, DATA READY
- +24 V internal printer Voltage (can be used to power e.g. sensor)
- GND

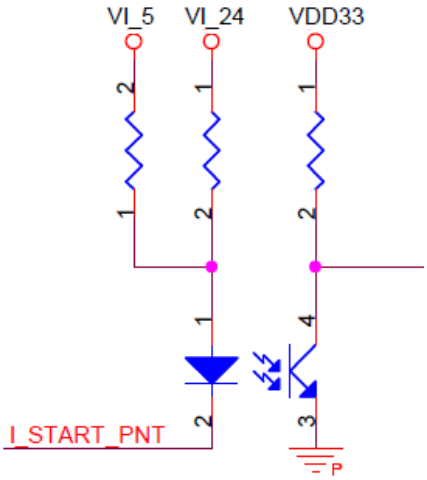
DB15 Pin description:

PIN Nr.	FUNTION	TYPE
1	GROUND	GROUND
	GND_{ext}	INPUT external ground GND_{ext}, if external power is used.
2	+5V, MAX. 500mA OR +24V, MAX. 1.5A	5/24 V depending on jumper configuration
	V_{ext}	INPUT external power V_{ext}, if external power is used.
3	START PRINT	INPUT SIGNAL
4	FEED LABEL	INPUT SIGNAL
5	PAUSE	INPUT SIGNAL
6	REPRINT	INPUT SIGNAL
7	+24V OUT	+24V Output (from printer)
8	UNASSIGNED	GROUND (from printer)
9	UNASSIGNED	N.A.
10	SERVICE REQUIRED	OUTPUT SIGNAL
11	END PRINT	OUTPUT SIGNAL
12	OUT OF MEDIA	OUTPUT SIGNAL
13	OUT OF RIBBON	OUTPUT SIGNAL
14	DATA READY	OUTPUT SIGNAL
15	UNASSIGNED	N.A.

Possible jumper configurations. Non-isolated with internal power is recommended when triggering device will be powered by the printer (sensor, button, etc.). Isolated with external power is recommended when external voltage will be used for inputs (PLC's, etc.), in this case, external power source should be connected to PIN's 1, 2 and accordingly configured Jumpers.

Non-isolated with internal 24V	Non-isolated with internal 5V
J4: Connected J5: Connect 2-3 J6: Connect 2-3	J4: Connected J5: Connect 1-2 J6: Connect 1-2
Non-isolated with external 24V	Non-isolated with external 5V
J4: Connected J5: N.C. J6: Connect 2-3	J4: Connected J5: N.C. J6: Connect 1-2
Isolated with external 24V	Isolated with external 5V
J4: N.C. J5: N.C. J6: Connect 2-3	J4: N.C. J5: N.C. J6: Connect 1-2

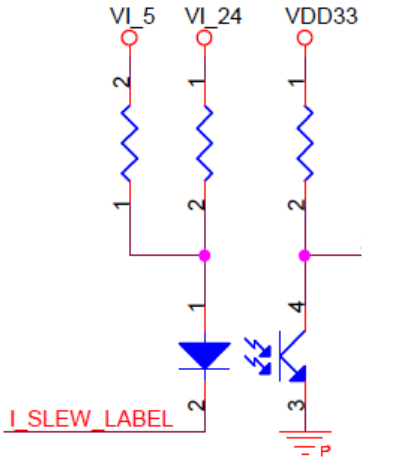
The most commonly used Input is the Start Print input. Used to trigger the printing of a label. Printjob must be already in printers memory and Applicator mode should be activated (^O2 setting in EZPL). Input is activated when current flows from PIN 3 to ground. That means when PIN 3 is connected to ground (level L), input is in active state.



Start print (PIN3):

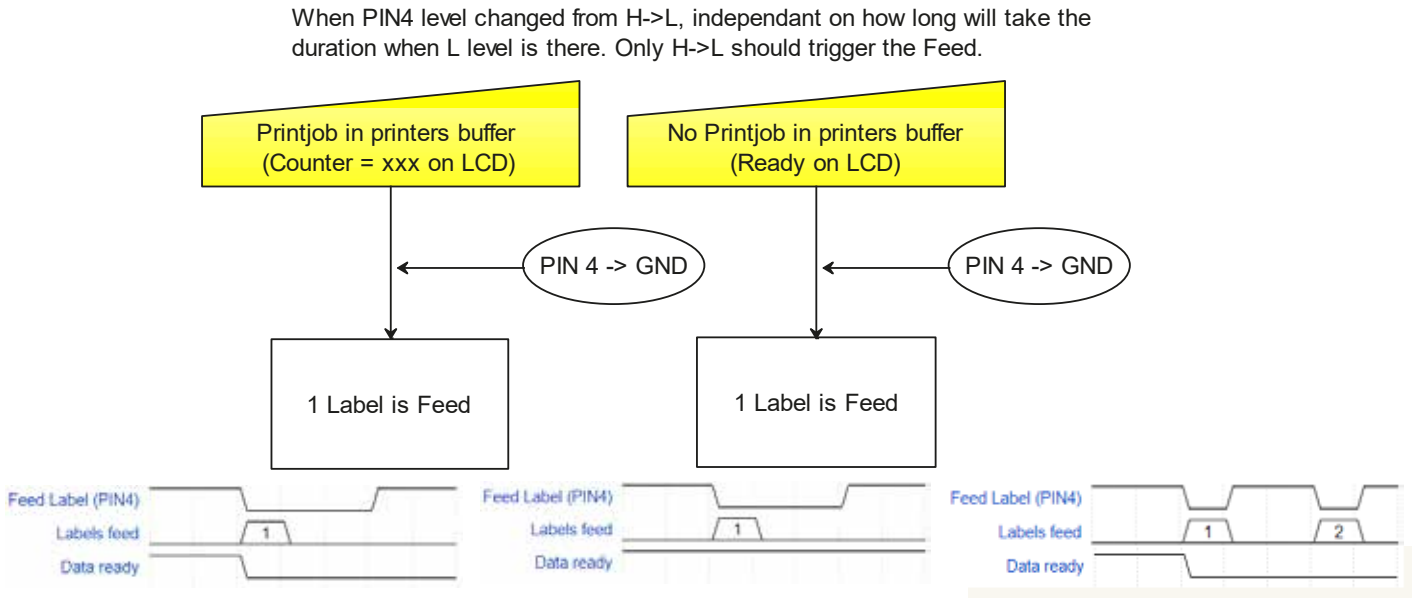
Start print functionality has 4 Start modes, which can be selected by appropriate command.

1. Level mode (^XSET,APPSTARTMODE,0) – Labels are being printed until PIN3 is L
2. Pulse mode (^XSET,APPSTARTMODE,1) – 1 Label is printed only on PIN3 transition from H->L
3. Pulse mode (^XSET,APPSTARTMODE,2) – 1 Label is printed only on PIN3 transition from L->H
4. Pulse mode (^XSET,APPSTARTMODE,3) – 1 Label is printed independent of the PIN3 transition direction, that means 1 label is printed both, on H->L and L->H.



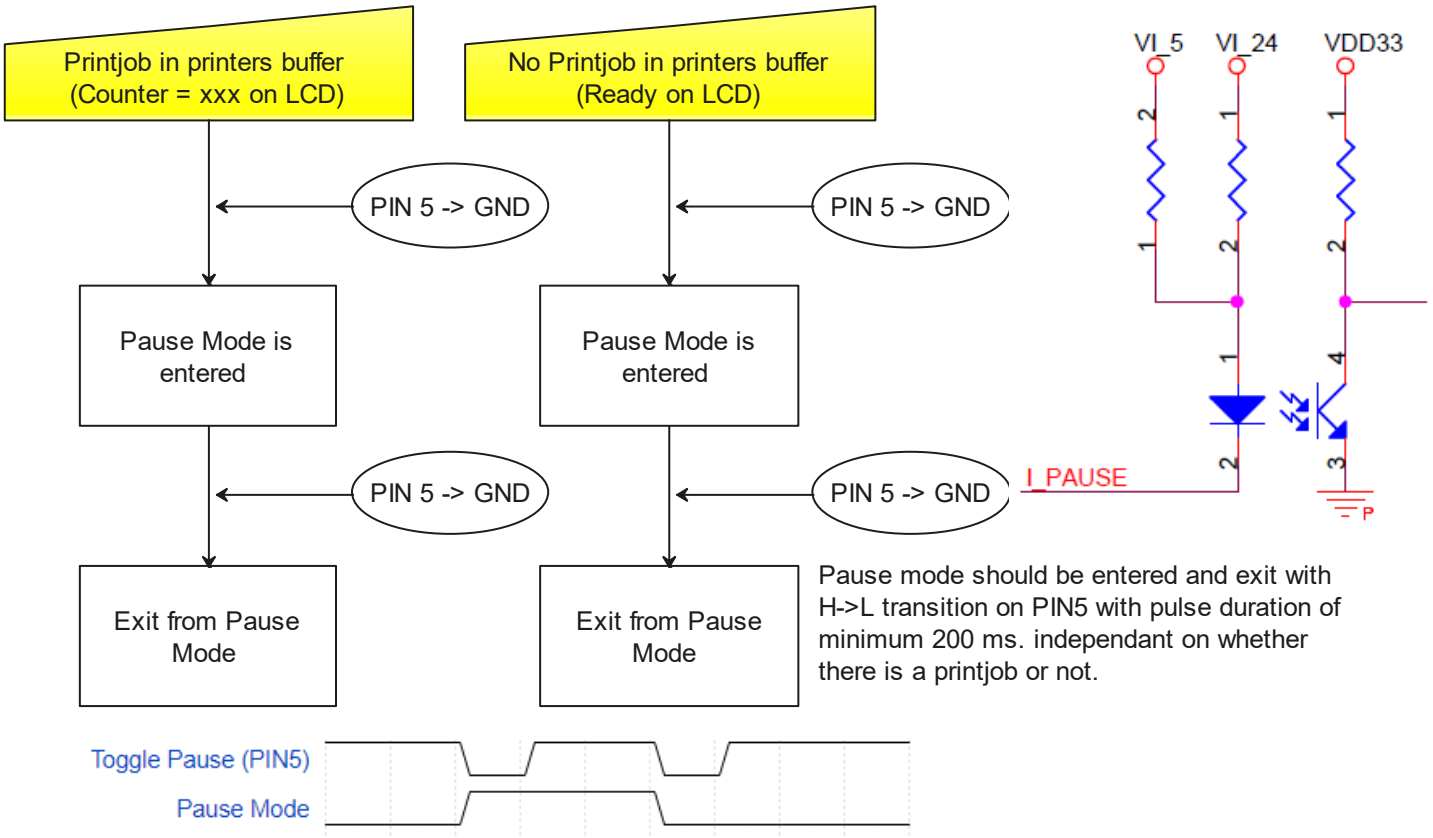
Feed Label (Slew label) (PIN4):

Feed function is working independently of whether there is a printjob in printers buffer or not, H->L transitions on PIN4 are treated as Feed trigger. See diagrams below:



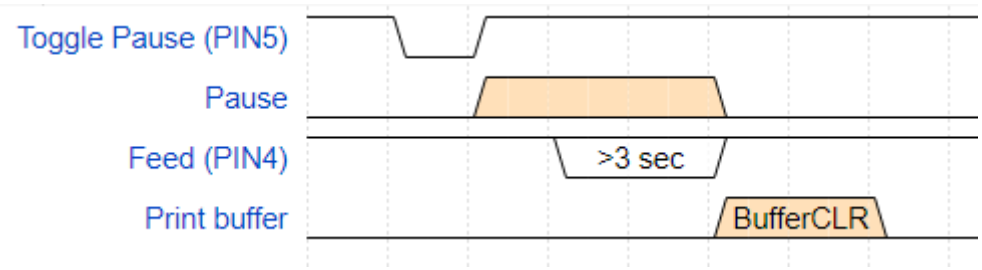
Pause (PIN5):

To enter Pause Mode the signal Level on PIN5 should be kept L at least 200 ms. (PIN5 H->L + >200 ms L) To exit Pause mode, the signal Level on PIN5 should be kept L at least 200 ms. (PIN5 H->L + >200 ms L).
It is possible to enter Pause mode independently of whether there is printjob in buffer or not.



Clear printers buffer (delete all printjobs):

When in pause mode, the Feed signal is activated kept L for more than 3 secs, printer buffer is cleared (all printjobs in the printer are deleted), same as holding the front Feed button. After print buffer is cleared, printer returns automatically to Ready state.

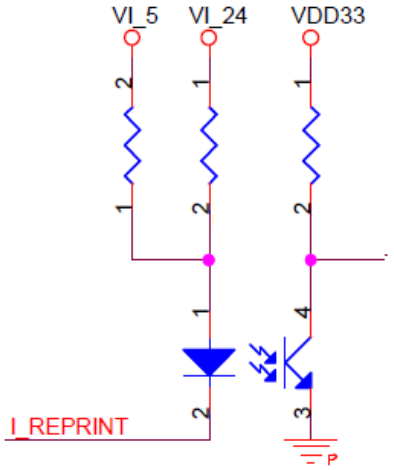


Reprint *(PIN6)*:

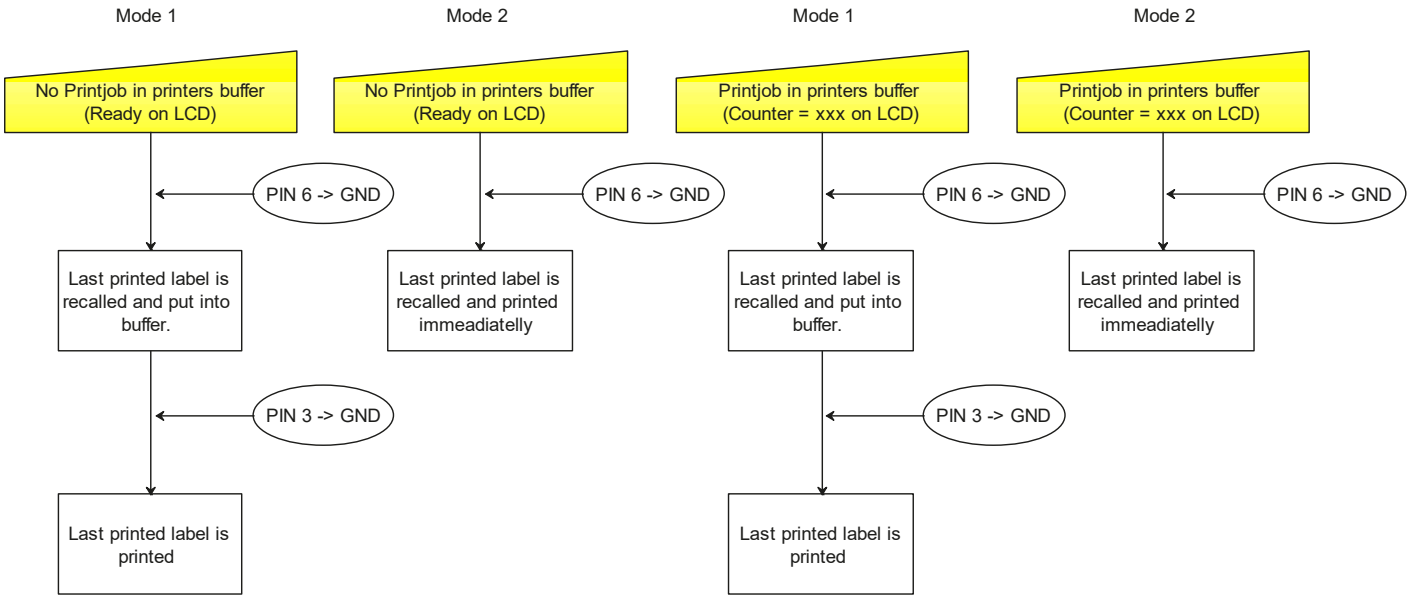
Reprint last printed label function is needed, if the last printed label was damaged, lost, media got empty, etc. When activated, last label (! 1 label !) that was printed last is recalled and printed identically as it was printed before, that means, if there were any variables transferred from other systems, devices, counters, databases, RTC, etc. to be printed in the label, they stay completely the same as they were printed in the last label that was printed before.

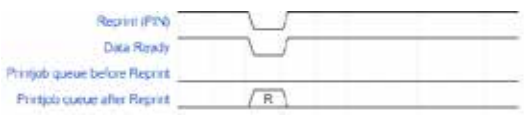
Reprint function has two possible operation modes:

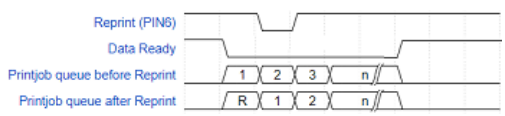
1. **Mode 1**. Recall the last printed label and put it into the buffer queue to be printed first. If ^O2 is activated, wait until pulse on PIN3 (Start print signal). *This is the default setting*.
2. **Mode 2**. Recall the last printed label and put it into the buffer queue to be printed first and print this one label immediately independent on the ^Ox setting.



Syntax	^XSET,REPRINTMODE,x
Parameter	x=1, if ^O2 is activated, wait until trigger signal on PIN3. x=2, print one label immediately independent on the ^Ox setting.
Description	Works with firmware version V2.Y2Y or later
Example	^XSET,REPRINTMODE,1 (Detect Start Print signal) ^XSET,REPRINTMODE,2 (Ignore Start Print signal)

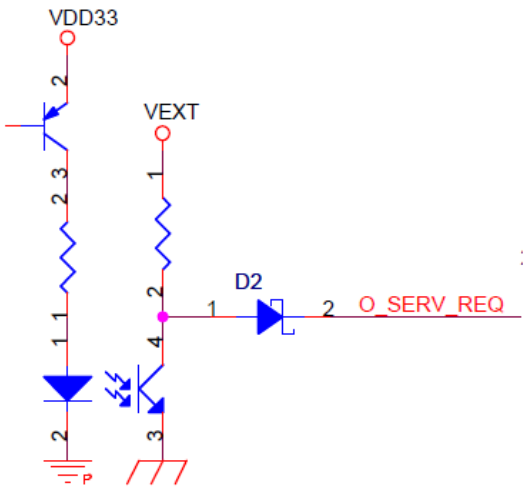




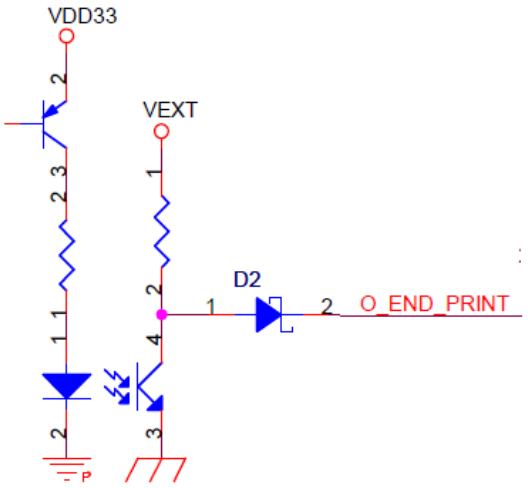


Outputs:

Service required (PIN10):
H->L when there is any kind of error.

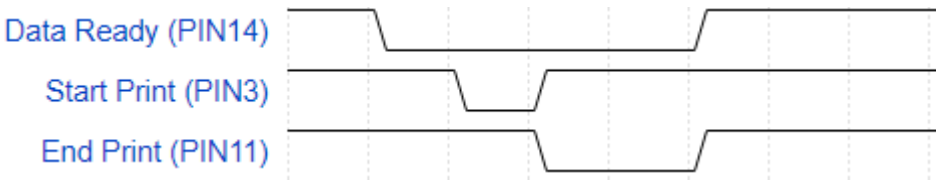


End print (PIN11):
Pulse when printing is finished. The timing diagrams of this output are dependent on the selected Mode.

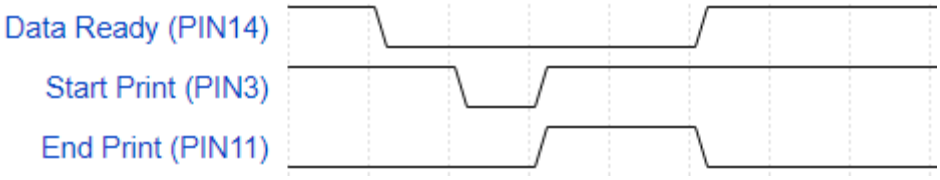


There may be 4 modes, which can be selected by command ^XSET,APPLICATOR,0,x , where x is the mode number:

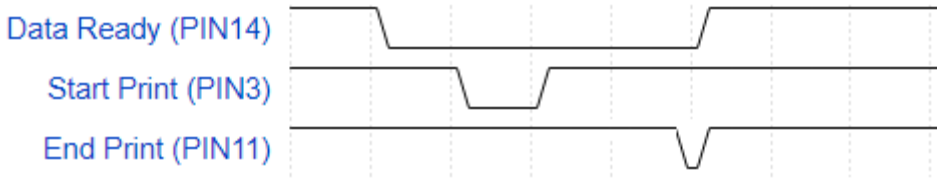
Mode 1 ^XSET,APPLICATOR,0,1



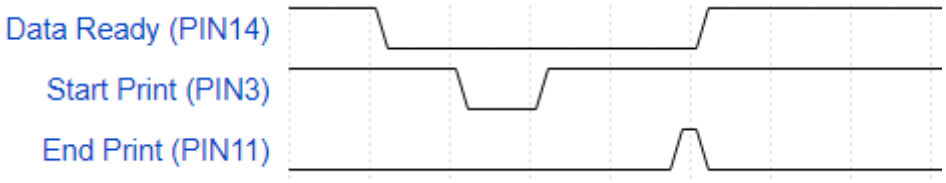
Mode 2 ^XSET,APPLICATOR,0,2



Mode 3 ^XSET,APPLICATOR,0,3



Mode 4 ^XSET,APPLICATOR,0,4



Check Media (PIN12):
H->L when there is media error.

Check Ribbon (PIN13):
H->L when there is ribbon error.

Data Ready (PIN14):
H->L when data is in the buffer