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IP600 Inkjet Printer

Instructions for Operation and Maintenance

Safety First

Use goggles when carrying out maintenance of the ink jet. The unit fires ink when the photocell is triggered by boxes or by operators hands or clothing. Avoid working in front of the print head with the power switched on unless you need to.

Mains voltages are present within the base unit. Work according to accepted safe practices whenever the internal power supply modules are exposed. Dot not work inside the unit without isolating the mains supply first.

Waterbased ink has no particular hazards. Ethanol based ink should be stored in accordance with the regulations appropriate to your factory and environment. Dispose of used inks according to your local authority regulations, do not dispose of used ink by pouring it into the drainage network.

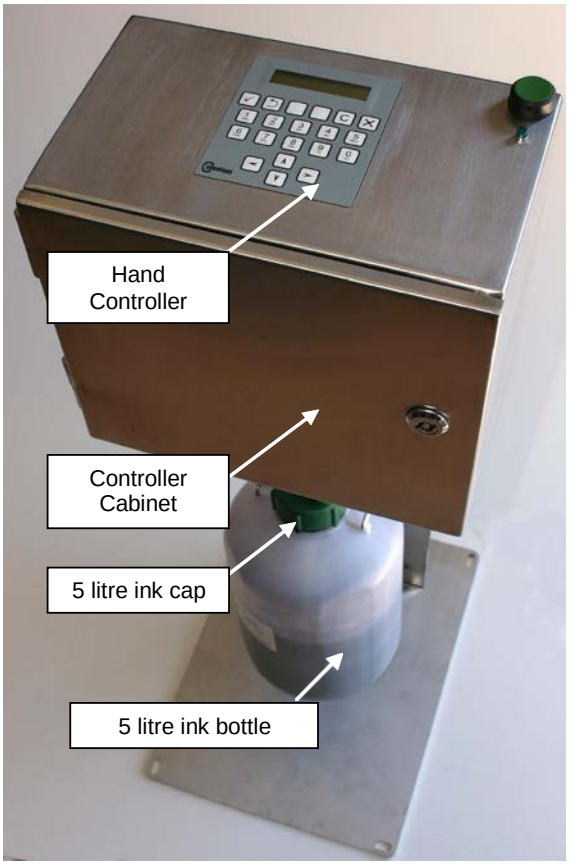
The printer incorporates its own air pump and supply. DO NOT CONNECT THIS SYSTEM TO THE MAINS AIR AS THERE IS A RISK OF THE INK BOTTLE EXPLODING AT PRESSURES OVER 15 PSI/1bar.

Overview

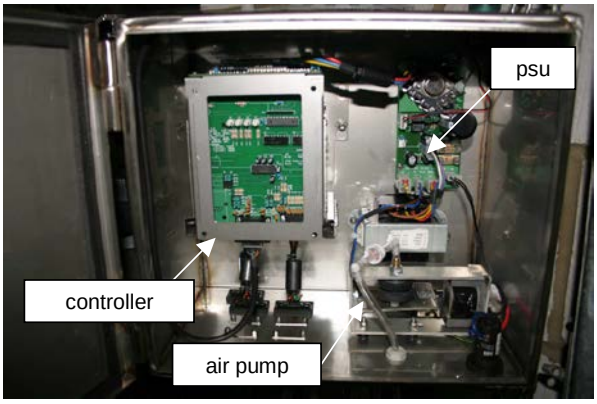
The ip600 ink jet printer is a microprocessor controlled printer for marking cardboard boxes, timber, concrete blocks, shrink-wrap and similar items. It operates by firing solenoid valves in a particular sequence in front of a moving product. As the valves open, they release pressurised ink through a series of tubes and nozzles. The valves open very quickly, so the ink is ejected as a droplet. By opening the valves in the correct sequence at the correct speed, words are formed on the product from the droplets.

A tour through the system

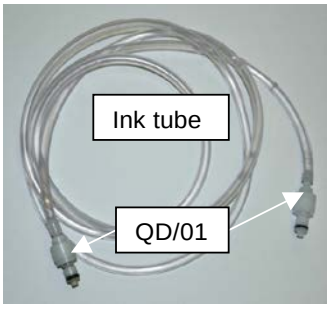
The fluid used to print is ink. The clear fluid used to flush and clean the system is cleaner or flushing fluid.



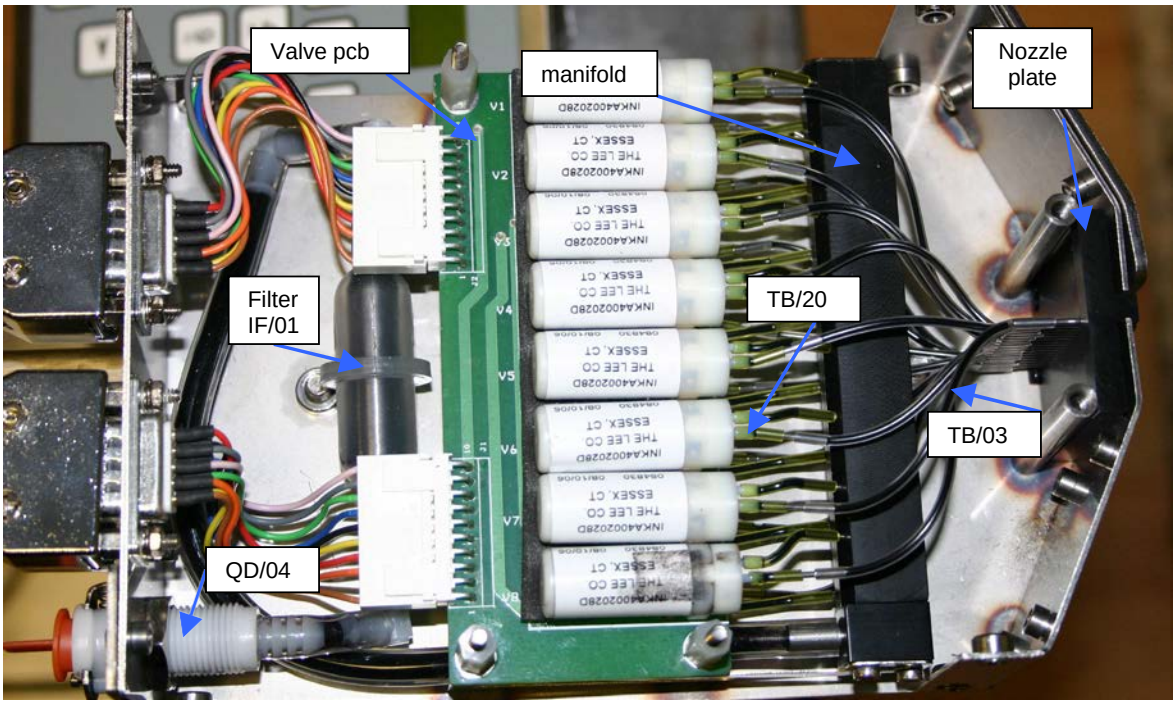
The controller cabinet houses the power supply (PSU), air pump, controller and hand controller. The air pump pressurises the ink bottle via the 5 litre ink cap. The ink is supplied from a 5 litre ink bottle that sits on an ink tray on the integral stand



The pressurised ink is fed up the ink tube (with quick disconnect [QD/01] fitting at each end) to the print head.



In the print head, the ink passes through a female QD/04 fitting, through a filter IF/01 and into a manifold. From the manifold the ink branches out into 7 smaller tubes (TB/20). These attach to VALVES. The outlet of the valves is via more TB/20 tubing, which is attached to a STEEL which is then attached to TB/03 tubing and then the NOZZLE PLATE. The nozzle plate consists of steels as inputs, with ink droplets ejected through SAPPHIRES.



The valves are controlled from the control unit via a driver board and print head cable. The print sequence is triggered by a photocell detecting the box. The time waited between the photocell triggering and the print starting is called the print delay. The time that each valve is opened is called the dot size. How fast each dot follows the previous one is controlled by the speed.

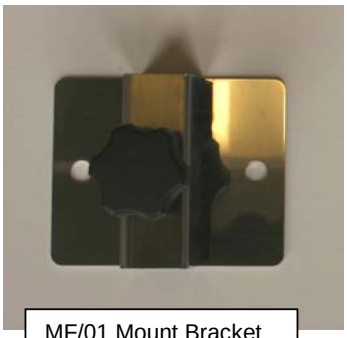
The final print quality is controlled by the speed, the dot size and the air pressure. It is also greatly affected by how clean the valves, sapphires and tubes are and how much ink flow the filter is allowing. It will help to purge the system on a regular basis, and carefully spray the nozzle plate with cleaner to remove cardboard debris.

There are various other parameters available (described on the quick reference sheet) that generally will not need to be altered from installation.

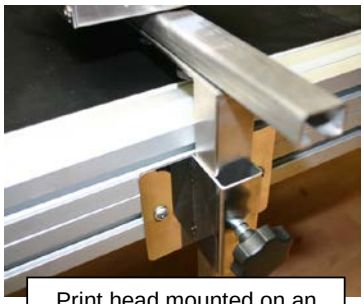
Installation

Decide on an installation point for the printer and head.

An MF/01 mount bracket is supplied to to mount the head to your conveyor.



MF/01 Mount Bracket



Print head mounted on an MF/01 bracket

For installations with two print heads, one each side of your product, each print head will need an MF/01 mount bracket.

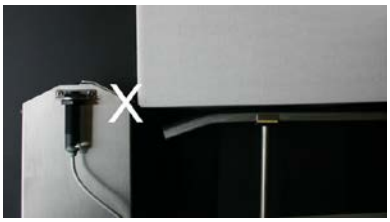
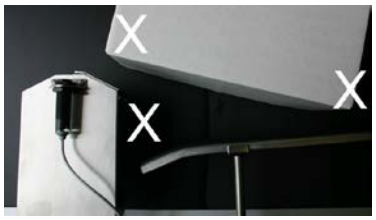
The print head to printer cables, photocell cables and ink lines are 1 or 2 metres as standard. Ensure that the cables will reach from the control cabinet unit to the print head(s) without strain.

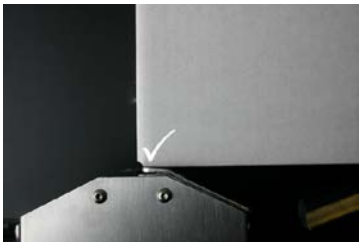
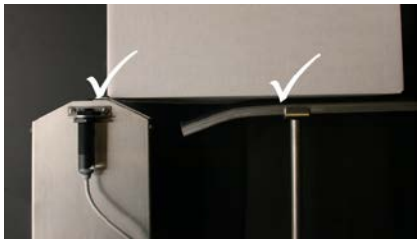
Aim to place the cabinet near to the head and slightly below it with the top of the ink bottle ideally no more than 0.5m below the top of the print head. If the ink bottle is too low it will reduce the effective ink pressure at the head which can affect the print quality.

The print head should be mounted so that it rubs gently along the face of your product. Standard brackets are supplied to allow you to print on a vertical face, if you wish to print on a horizontal face (the top or bottom of timber sheets for example) special brackets are available from Codeology.

Place the print head on a section of conveyor that adheres to the following rules (in order of importance):

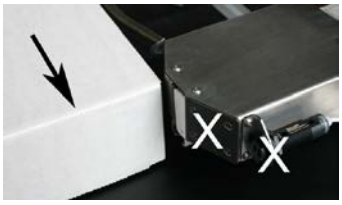
- Ensure the product is guided so that it just brushes the head.
- Allow for broken or misaligned products - the guiding should deflect these from the head rather than allowing them to crash into it.
- Products should not stop in front of the head.
- Products should have a gap between them of at least 25mm.
- Conveyor speed is no more than 28 m/min (the slower the speed the easier to maintain good print quality).
- Conveyor speed is fixed, not accelerating or decelerating.
- Pick a flat section of conveyor. Any deviations in the conveyor bed will transfer to the print, giving wavy and uneven print.
- Driven belts (i.e. case tapers) are preferable to roller conveyors to ensure smooth product drive and maintain optimum print quality.

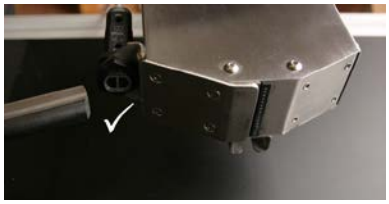



Decide on a position to mount the photocell product detector. The standard photocell is a diffuse reflective type (that is it 'sees' reflections from a product appearing in front of it). A retro-reflective type that uses a reflector as a mirror (that sees a product as an interruption between it and the reflector) is available from Codeology where diffuse reflective will not work.

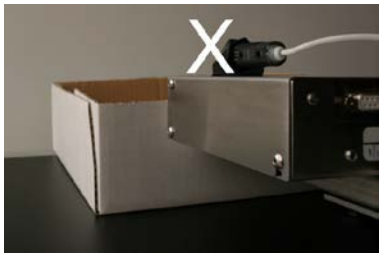
The photocell bracket fits to the left, right or top of the print head. Place it on the leading edge of the print head (so that the photocell 'sees' the product before it reaches the head) if possible.



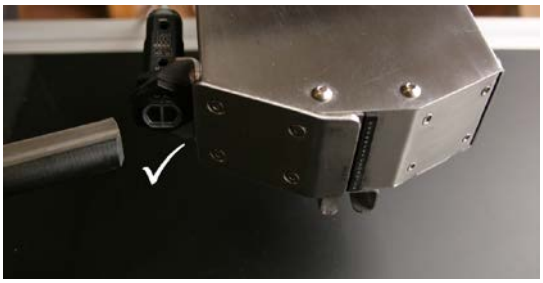


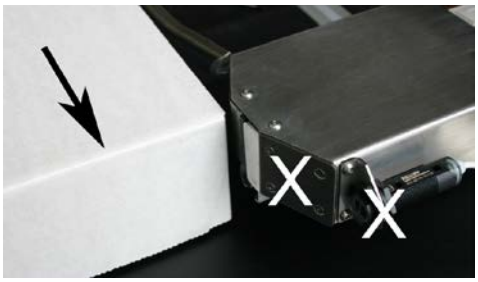
Place the photocell so that it adheres to the following rules:

- The photocell face is at least 25mm from your product
- It should face plain, unprinted, unbroken areas of the product. Holes in cardboard boxes, large areas of pre-print, and spaces between yoghurt pots or bottles will all be seen as gaps between products.
- Do not place it so that it looks directly across the conveyor at any other photocell (of any type) as they may trigger each other.
- If placed on top of the print head, make sure it does not look over the top of low products.

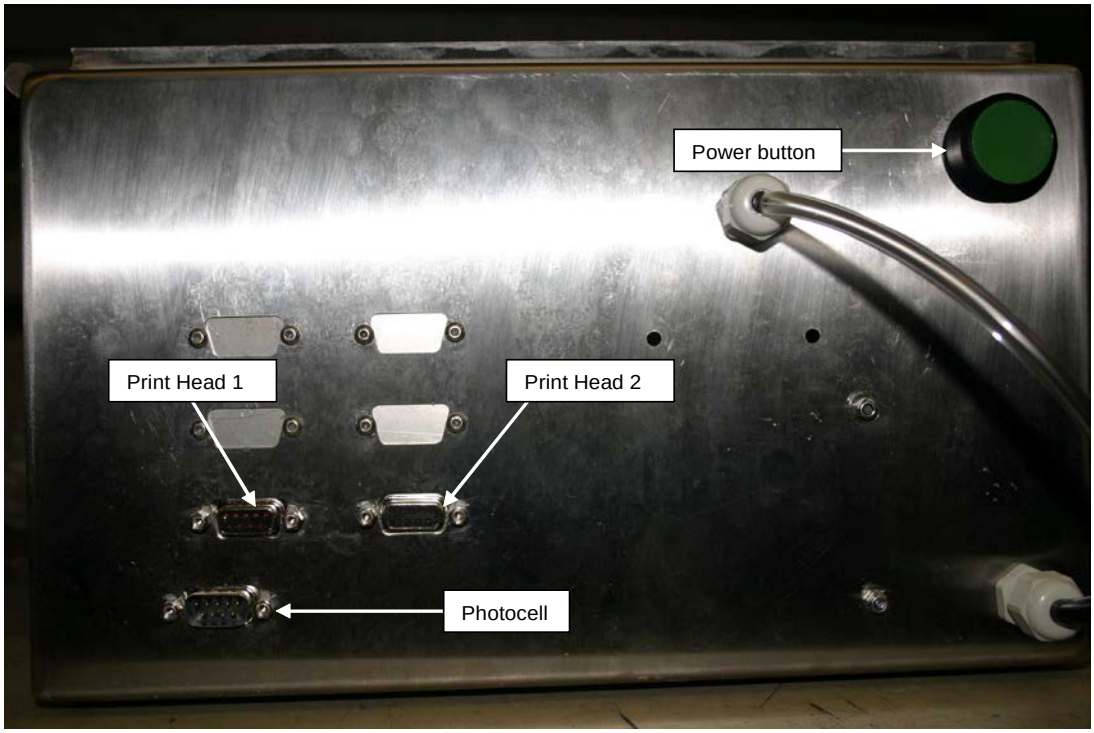



Ensure that the buffer plate is positioned on the leading edge of the print head. If you need to change the side, remove the four countersunk screws holding it to the head, rotate the buffer plate and fix it to the opposite side of the nozzle plate.





Connecting everything up.



Connect the photocell to the control cabinet.

If any cables have ferrite beads fitted, fit the cables so that the ferrites are at the cabinet end.

Remove the transit cap and the inductive seal from the ink bottle. Screw the ink cap firmly onto the bottle but do not overtighten. The cap O-ring will maintain a tight seal with the cap hand-tight. Secure the bottle on the printer unit by hooking the bottle handle over the lip on the top of the base.

For a single line print head, connect the print head cable to the left hand print head connector on the cabinet. Connect the other end to the print head.

For two single line print heads, connect the first print head cable to the Print Head 1 on the control unit. Connect the other end to one print head, this will be head 1. Connect the second print head cable to the Print Head 2 connector on the control unit. Connect the other end to the

second print head, this will be head 2. Either head can be positioned on either side of the conveyor.

For a twin line print head, connect the first print head cable to the Print Head 1 connector on the control unit. Connect the other end to the right hand connector on the print head. Connect the second print head cable to the Print Head 2 on the control unit. Connect the other end to the left hand connector on the print head. Line one will appear on the top of the head, line two will appear on the bottom.

Connect the air line on the printer base to the air connector on the ink bottle. DO NOT CONNECT THIS SYSTEM TO THE MAINS AIR AS THERE IS A RISK OF THE INK BOTTLE EXPLODING AT PRESSURES OVER 15 PSI/1bar.

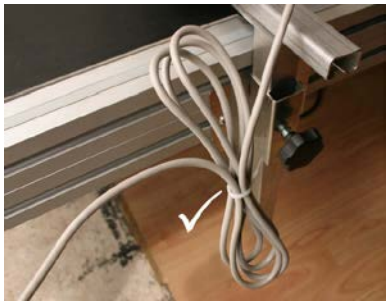
Connect the ink line to the ink cap but DO NOT connect it to the print head yet. If you have two print heads you will have a y-piece in your ink line. The single section of the ink tube connects to the bottle, the two identical lengths go to the print heads.

Finally connect the mains power cable. The unit will always be supplied for 240V 50Hz operation unless you have specified otherwise at the time of order. There is a jumper setting internally on the power supply to allow you to change this if necessary.

Cable positioning

Strap cables and ink lines out of the way of passing pedestrians or pallet trolleys. Do not leave loops of cables dangling where brooms can catch them during cleaning. Cable tie the photocell, head cables and ink lines together.

DO NOT coil any excess mains, photocell or print head cables. This makes an aerial loop that picks up and amplifies electrical noise present in every factory and may induce interference in the printer. For mains cables shorten the cables to length. For other cables, if they must be coiled then wrap then in a figure-of-eight arrangement and cable tie them in the middle. This prevents the coil formation and reduces induced electrical interference.



Do not hang cables over motors, or run alongside high voltage or motor drive cables or trunking. All of these may induce interference in the printer.

Commissioning the print heads

Switch on the unit. Wait 30 seconds for the air pressure to build up in the ink bottle. Place a container at the end of the ink tube. Press the centre section of the QD fitting on the inside wall of your container and release the air then a little ink from the ink tube. Repeat for the other leg of the ink tube if you have two print heads. Connect the ink lines to the print heads. DO NOT

allow the ink fittings to drag on the floor before plugging them into the heads as they will pick up debris which may affect your print quality.

Place a container in front of the print head. Note that you will need a high-walled container as the ink jets fly out in a straight line and can jet over 600mm from the head.

Select purge from your hand controller or PC (see quick reference sheets or iText manual to do this). If you have two heads, select purge for line 1 only at this point. If you have a twin line print head select purge for both lines.

Cover the photocell. Ink will be ejected into the container for as long as you cover the photocell. Purge the head of the clear shipping fluid, then allow the ink and any trapped air to flow from the nozzle plate until all of the nozzles stop spluttering and give straight jets of ink.

Turn off the purge (switching the unit off for 10 seconds then back on again will switch the purge off if the control PC is a long way from the unit).

Repeat the process for a second print head if applicable.

Setting up the first print

For all subsequent hand controller or PC commands, refer to the quick reference sheets.

Message 1 will always have a test message pre-programmed when the printer leaves the factory. It will also have the correct parameters to ensure the unit will print if the photocell is covered. Ensure message 1 is selected for print.

Hold a piece of cardboard in front of the print head and cover the photocell. Make sure that ink is ejected onto the cardboard.

Next run the cardboard by hand past the photocell and print head. Run it in the direction that your product will go past the head. Check that the test message is printed onto the cardboard and that the buffer plate is on the leading edge of the head.

Now try and run the cardboard past the head at the conveyor speed. The print may miss the cardboard, start too early, stop too late or appear too wide or too narrow. Adjust the print speed to get the print speed aligned with the conveyor speed, smaller speed values equate to faster conveyor speeds. Then adjust the print delay to get the positioning correct.

Next present one of your products to the print head and adjust the dotsize to get the print that suits your preferences.

Finally edit the message from the Codeology test message to the one that you wish to use.

The hand controller may now be removed or can be left in place as you wish.

Commissioning is now complete.

Running in

You may see that the print quality initially is not as good as the test print that came with the printer. This is for several reasons.

The cleaner that is shipped in the head dilutes the ink and takes several hundred prints to be completely flushed through. This gives a varying dot spread on your product. It will improve as the ink flushes out all of the cleaner.

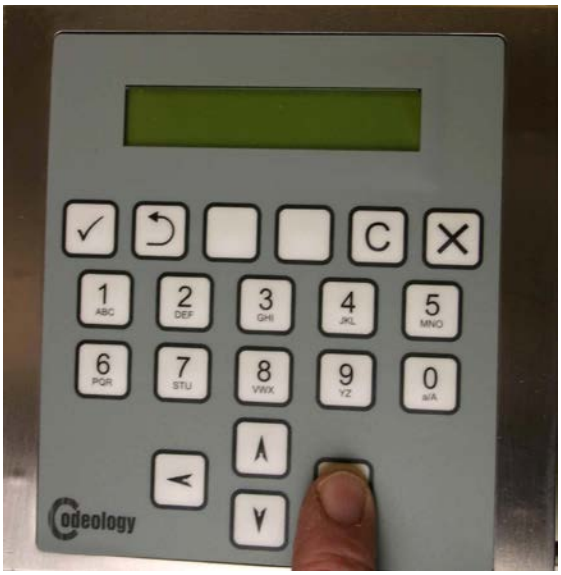
It can take several thousand prints to finally eject all of the microscopic air bubbles that lie in the manifolds, valves and tubing. These will have been introduced when the ink lines were connected. Purging at the start of each shift for the first three shifts will help to disperse these.

Initially you may see slight variations in the dot sizes from each nozzle. This is normal and will reduce as the valve plungers gradually wear into their seats. Over the first 2-3 weeks of operation, you may notice the droplet size creeps up as the valves bed in. Reducing the dot size in stages will compensate for this. A dot size of around 180 on installation is normal, after approximately 50,000 prints the units will run perfectly well at around dot size 150.

Control Unit Operation Overview

The control unit houses the microprocessor, memory and real-time clock. Driver boards plug into the bottom of the unit to drive print heads.

The controller holds 101 printing messages, any of which can be selected from the keyboard. The printing messages each contain 6 blank lines of print, reflecting the ability to drive 6 lines even if all of the driver boards are not fitted.



The control software is similar in operation to most mobile phone menu selections. A 'tick' key (✓) and a 'backup' key (↩) allow selection of an item on the screen, so scrolling until 'Dotsize' is shown on the screen then pressing ✓ takes the operator into the dotsize menu for example. Pressing ↩ takes the operator back out of the menu to where they started.

There are also two blank keys that are used when an 'either-or' response is required, so for example when the print delay menu is selected, the question is asked 'Forward or Reverse?'. The left blank key is the first option, the right blank is the second, so in this example pressing the left blank key will answer 'forward', the right will answer 'reverse'.

To minimise the number of keys and space, editing uses the same principle as texting on a mobile phone. For example, pressing the 1 key shows 'ABC1abc' in the top right of the screen. Pressing the 1 key again within 0.75 seconds highlights 'A', press again and 'B' is highlighted and so on until no key is pressed with 0.75 seconds. The last letter/number selected then drops into the message. Anyone used to texting gets the hang of this in under a minute. The 'C' key is used to delete any mistakes. Press C deletes the last key entered. Use the arrow keys to navigate around, then C will delete the character to the left of the flashing cursor.

Refer to the quick reference sheets at the back of this manual for complete operating instructions.

Maintenance

Replacing Ink Bottles

For trouble-free operation use only Codeology inks. Switch off the unit, disconnect the air and ink fittings from the 5 litre cap. Unscrew the cap from the old bottle, remove the cap and foil seal from a new bottle. Replace the cap on the new bottle and reconnect the air and ink lines.

Ready a small container to collect the first ink through. Remove the ink line from the print head. Switch the printer on and wait 30 seconds for the air pressure to build up. Push the QD fitting against the inside face of the container and allow ink to escape from the ink line. Within a few seconds, trapped air will be ejected. Release the QD fitting and replace it into the head. Continue printing as normal.

If you have not removed all of the air from the system, or the previous ink bottle ran out, then you may find after 200-300 prints that the print degrades as the air comes through. If so, simply purge the head.

At the end of each shift.

Switch the printer off. Spray cleaner onto the nozzle plate and wipe off GENTLY with the Codeology wipes supplied. Do not wipe too hard as you will push cardboard fibres into the sapphires and block them.

Every 6 months (every 3 months in dusty environments)

Replace the head filter. Switch off the unit, remove the air connector from the top of the ink bottle to remove the pressurised air from the system. Unplug the filter by pulling the TB/04 tubing from each end. Replace the filter with a new one, noting that there is an arrow moulded on the body to indicate flow direction. Ensure this points away from the QD fitting.

Replace the ink filter on the dip tube from the ink cap. Note the arrow showing direction of flow should point upwards.

Purge the head until no more air is ejected from the nozzle plate. Note that there may still be a bubble of air in the filter body, this is normal.

Replacing Ink Bottles

NB for trouble-free operation use only Codeology inks. Switch off the unit, disconnect the air and ink fittings from the 5 litre cap. Unscrew the cap from the old bottle, remove the cap and foil seal from a new bottle. Replace the cap on the new bottle and reconnect the air and ink lines.

Ready a small container to collect the first ink through. Remove the ink line from the print head. Switch the printer on and check the air pressure climbs. If it does not, check the cap is tight. Once the pressure is above 1 psi, push the QD fitting against the inside face of the container and allow ink to escape from the ink line. Within a few seconds, trapped air will be ejected. Release the QD fitting and replace it into the head. Continue printing as normal.

If you have not removed all of the air from the system, or the previous ink bottle ran out, then you may find after 200-300 prints that the print degrades as the air comes through. If so, simply purge the head.

Purging

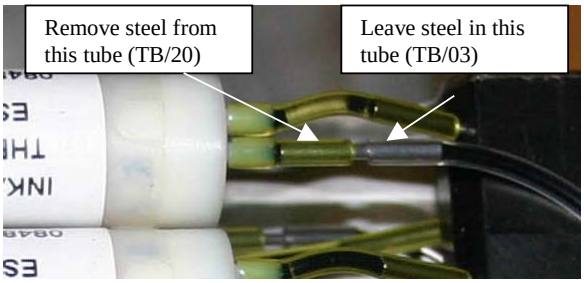
If the print degrades due to air in the ink following an ink change, or you have cleaned the nozzle plate using a syringe, you should purge the print head. Switch off the printer. Remove the head from the bracket and point it into a container to collect the ejected ink. Note that you will need a high-walled container as the ink jets fly out in a straight line and can jet over 600mm from the head.

Switch on the unit, and select Purge from the maintenance menu (see the quick reference sheet for how to do this). Press the left blank key then ✓. Now cover the photocell to start the purge cycle, uncover it to stop. If you do not see 7 jets in a straight line with no deviations or wandering, then clean the nozzle plate with the syringe as described above.

Once you have seven (or 8 on a twinline head) good jets, switch the printer off and reinstall the head. When you switch back on again the printer will be ready to print.

Head cleaning with a syringe

If during purging you cannot get all jets straight with no deviations you will need to backflush the nozzle plate with a syringe to remove the debris causing the blockage.



First remove the steel from the yellow TN/20 tubing where it leaves the valve. To do this, hold the TB/03 tube with a pair of long-nosed pliers and with your thumbnail ease the TB/20 from the steel. Take care when doing this for the first time as the tube is a tight fit.

TAKE CARE NOT TO STRESS THE VALVE CONNECTOR AS YOU CAN BREAK IT OFF.

DO NOT REMOVE THE STEEL FROM THE CLEAR TB/03 TUBE OR THE TB/03 TUBE FROM THE NOZZLE PLATE. The TB/03 has a ‘memory’ and will retain the new bigger diameter when you put it back on which will cause it to leak.

Having removed the steel from the TB/20, fit the syringe tube onto the steel instead. Spray some cleaner on the nozzle plate and suck back with the syringe. Remove the syringe, suck some fresh cleaner into it, then empty the syringe immediately to remove any debris sucked back from the nozzle plate. Suck fresh cleaner back in to the syringe, then re-attach it to the nozzle plate. Squirt cleaner through the nozzle plate and check the fluid jet is straight. Let the pressure decay naturally on the syringe and check the jet drops off gently. If it suddenly stops or changes angle suddenly, repeat the whole process. When the jet is straight and decays gently, suck back on the syringe finally and remove the syringe from the nozzle plate. Discard the syringe contents, re-attach the valve tubing and retest the print. If you cannot get the nozzle clear, replace the nozzle plate.

If after cleaning the problem jets you still have no print, replace the valve and re-test. The valves can sometimes be cleaned out by opening them with a magnet applied to the valve body and flushing through with a syringe full of cleaner. If this does not work, discard the valve.

Troubleshooting

Power light is not illuminated when the unit is switched on.

Check the mains fuse, which is located in an in-line fuse holder in the bottom right corner of the cabinet.

The power light is driven frrom the secondary voltages on the power supply, so also check both fuses on the power supply. Each fuse has a red light showing through it if it has not blown.

No print

- Check the red light on the side of the driver board. It is off until the photocell is triggered, when it comes on and flickers as the unit prints. If the light stays out, either the 40 volts fuse on the power supply has failed or you are printing to the wrong print head.
- Check the ink level and the ink tube to the head is full of ink.
- Is there air pressure? Briefly unclip the air connector on top of the bottle, the air should hiss as it escapes the bottle. If not, the 5 litre cap is lose or broken.

Check the box counter. Does it go up when the photocell is triggered? If so, the unit thinks it is printing so check:

- The screen shows ‘Msg XXX printing’. Is XXX the message number that you want?
- Edit the message. Does it have something in it to print?
- Is the dotsize between 150-180

If no, then check

- Is the photocell is seeing the box. Clean the photocell if necessary NB switch the unit off first to avoid ink being ejected into your eyes as you wipe the photocell.
- If the photocell is seeing the product, ensure that the shaft encoder option is not enabled (see quick reference sheet under Set Options to switch the shaft encoder off). Switch the unit off, wait 5 seconds the switch on again and retest. If that fails call Codeology for assistance.
- Is there any ink being ejected from the nozzle plate? If yes, check the delay settings to see if the printer is printing after the box has gone.
- If no, try purging the head. If still nothing, replace the filter and re-test.

Dots missing

Purge first of all. Are some of the jets twisting and not straight? If so backflush the nozzle plate with a syringe, following the instructions given under routine maintenance.

If after syringe cleaning the problem jets you still have no print, replace the appropriate valve and re-test. The valves can sometimes be cleaned out by opening them with a magnet stuck to the valve body and flushing through with a syringe full of cleaner. If this does not work, discard the valve.

Accessing the internal electronics

The control unit is controlled via the hand controller built into the cabinet. The hand controller is connected to the control unit via a serial cable. The print heads and photocells are connected via extension leads to the cabinet base. The controller is a standard Codeology i500 ink jet, mounted inside the IP65 cabinet. This allows standard spares to be used in the ink jet, keeping costs down.

The control unit can be removed from the cabinet by unplugging the power loom and all the cables from the bottom of the controller with the exception of the photocell cable. This must be unscrewed from the bottom of the cabinete as it is not possible to access the connector insode the controller from outside the cabinet. Loosen the two M6 nylock nuts from each side of the controller and withdraw the controller from the cabinet.

The hand controller can be accessed easier with the controller removed first. Once the controller is out of the way, remove the serial cable from the hand controller. Remove the 4 M3 x 6 button-head screws from the printed circuit board. Gently pull the keyboard connector from the pcb and display assembly, and the remove the pcb.

If you need to remove the keypad, remove the m3 x 14mm stand offs and withdraw the keypad from the top of the cabinet. Note that the keypad is sealed in position with silicon so require some force to remove it. When replacing the keypad, clean off the old silicon and replace with new to maintain the IP rating of the cabinet.

QUICK REFERENCE SHEET

Navigating with the keyboard

To select a menu, press the tick (✓) key.
To move back up, or escape from a menu, press the restore (↩) key.
Where you have a choice (e.g. Fwd or Rev for delay), the left blank key is the first option, the right blank is the second option. Similarly to set the forward or reverse direction, normal or inverse print, purge or not purge lines, the left blank key is the first option, the right blank is the second.

Editing

Messages are made up of lines, up to 6 lines per message. When editing, these are shown as e.g. 1/3, message 1 line 3. Line 1 is usually the top line.

Editing works line texting on a mobile phone. Press the 1 key and you will get 1, press it again within 0.5 seconds and you will get 'A', again for 'B' and so on until you scroll around again. If you make a mistake, press the 'C' key to clear the character.

There is a keyboard timer setting which take account of how long operators take to press keys This should be set high when operators are learning the keyboard. Experienced users will find a high setting frustrating so a lower number should be entered when the operators get used to the system.

Special commands within the message

{ } start and stop bold print 12{34}56 example 123456
<> start and stop incremental numbers <0000> examples, first 4 boxes print 0000 0001 0002 0003

Time

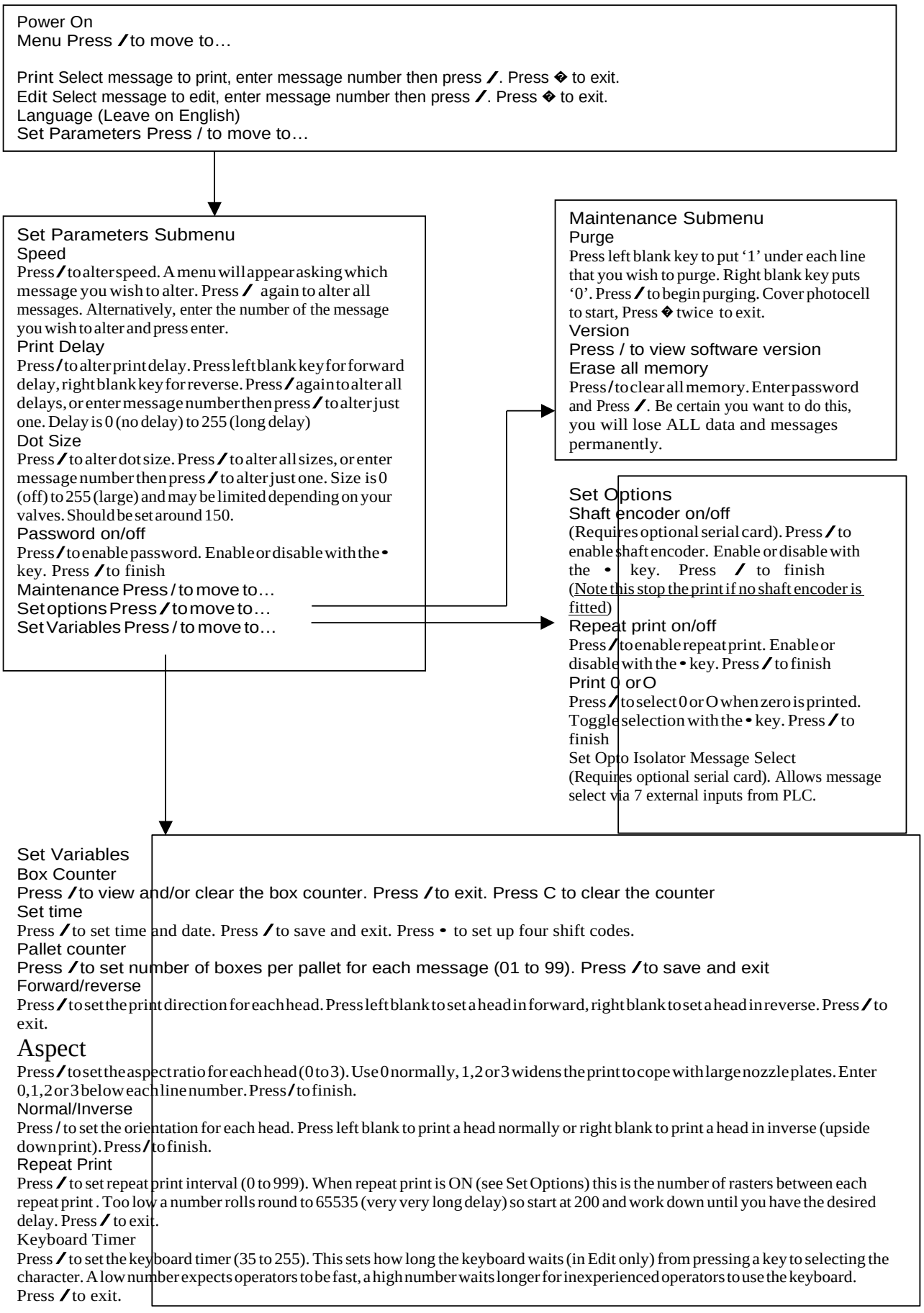
[and] start and stop the real-time clock commands e.g. [AB:CD] prints the time in 12:01 format. Any characters not in the list below e.g. : or / are printed directly.
AB hours CD minutes EF GH IJ Date/Month/Year (numeric) KLM Julian day of year
NO week number
P day of week Q shift number RST Month (alpha) UVW Day of year

Sell-by dates

Use clock codes as above
cM001 e sell by months (001 to 999) cM01EF/GH/IJe example 27/02/07 (if today is 27 Jan 2007)
cD030 e sell by days (001 to 999) cD030EF/GH/IJe example 27/02/07 (if today is 27 Jan 2007)

Other commands

c2 e start and end command for 16 dot (note the 2 after the c for 2-line print) 12c234e56 example 123456. Requires 16 dot twinline print heads.


Power On
Menu Press / to move to…
Print Select message to print, enter message number then press /. Press ◆ to exit.
Edit Select message to edit, enter message number then press /. Press ◆ to exit.
Language (Leave on English)
Set Parameters Press / to move to…
Set Parameters Submenu
Speed
Press / to alter speed. A menu will appear asking which message you wish to alter. Press / again to alter all messages. Alternatively, enter the number of the message you wish to alter and press enter.
Print Delay
Press / to alter print delay. Press left blank key for forward delay, right blank key for reverse. Press / again to alter all delays, or enter message number then press / to alter just one. Delay is 0 (no delay) to 255 (long delay)
Dot Size
Press / to alter dot size. Press / to alter all sizes, or enter message number then press / to alter just one. Size is 0 (off) to 255 (large) and may be limited depending on your valves. Should be set around 150.
Password on/off
Press / to enable password. Enable or disable with the • key. Press / to finish
Maintenance Press / to move to…
Set options Press / to move to…
Set Variables Press / to move to…
Maintenance Submenu
Purge
Press left blank key to put '1' under each line that you wish to purge. Right blank key puts '0'. Press / to begin purging. Cover photocell to start, Press ◆ twice to exit.
Version
Press / to view software version
Erase all memory
Press / to clear all memory. Enter password and Press /. Be certain you want to do this, you will lose ALL data and messages permanently.
Set Options
Shaft encoder on/off
(Requires optional serial card). Press / to enable shaft encoder. Enable or disable with the • key. Press / to finish
(Note this stop the print if no shaft encoder is fitted)
Repeat print on/off
Press / to enable repeat print. Enable or disable with the • key. Press / to finish
Print 0 or O
Press / to select 0 or O when zero is printed. Toggle selection with the • key. Press / to finish
Set Opto Isolator Message Select
(Requires optional serial card). Allows message select via 7 external inputs from PLC.
Set Variables
Box Counter
Press / to view and/or clear the box counter. Press / to exit. Press C to clear the counter
Set time
Press / to set time and date. Press / to save and exit. Press • to set up four shift codes.
Pallet counter
Press / to set number of boxes per pallet for each message (01 to 99). Press / to save and exit
Forward/reverse
Press / to set the print direction for each head. Press left blank to set a head in forward, right blank to set a head in reverse. Press / to exit.
Aspect
Press / to set the aspect ratio for each head (0 to 3). Use 0 normally, 1,2 or 3 widens the print to cope with large nozzle plates. Enter 0,1,2 or 3 below each line number. Press / to finish.
Normal/Inverse
Press / to set the orientation for each head. Press left blank to print a head normally or right blank to print a head in inverse (upside down print). Press / to finish.
Repeat Print
Press / to set repeat print interval (0 to 999). When repeat print is ON (see Set Options) this is the number of rasters between each repeat print . Too low a number rolls round to 65535 (very very long delay) so start at 200 and work down until you have the desired delay. Press / to exit.
Keyboard Timer
Press / to set the keyboard timer (35 to 255). This sets how long the keyboard waits (in Edit only) from pressing a key to selecting the character. A low number expects operators to be fast, a high number waits longer for inexperienced operators to use the keyboard. Press / to exit.