

Comparison Intermec 501/601 XP EasyCoder – CHESS/64-0x

Overview

The EasyCoder XP series is an enhanced version of the well-known EasyCoder printers. They have a new CPU board (with 32 bit RISC processor), power supply and print mechanism. The printers offer 300dpi resolution, two print widths 106.6mm(4.2") and 165.3mm (6.5") and print speeds of 300mm/sec (12 ips) and 225 mm/sec (9 ips) respectively. There are no 5" or 8" models available.

The 501 XP was the actual printer tested and compared to the CHESS 04/64-04. The 501 XP has a 4.2" print head and prints at 300 mm/sec.

Available standard features are: Tear off edge, memory card slot, serial/parallel interface, real time clock (a future CHESS/64-0x option).

Optional finishing devices are: Rotary knife, internal rewind, and dispenser

No ribbon saver system available.

Motor Drives: 1 stepper motor for media transport and ribbon, 1 stepper motor for dispenser/internal rewind option.

Short summary: Good speed for the first label out. Among all competitive products tested so far this is the best in terms of print speed. Suitability for industrial applications seems to be more towards low to medium output.

Specification Comparison

Reviewing specifications, the 501 XP is very comparable to the CHESS/64-0x in many respects with the 501XP having some unique internal firmware and application shells.

But after a detailed evaluation clear differences appear with reference to:

Print quality at higher speeds, especially on cardboard and heavy labels

Matching high volume applications

Durability/functionality of all components

Range of available print widths

Ribbon saver

Speed of First Label

Printing using printer resident fonts and barcodes or huge graphics or multiple labels across the web, from small to big labels – the CHESS/64-0x printers are up to 200% faster!

Print Speed

The high print speed of 12 ips is specified for both printers, but for the CHESS/64-0x it can be used for practically all applications. The Intermec XP is limited to lighter weight stocks.

The CHESS/64-0x handles both low to high volume applications including peak production requirements. The Intermec XP is more for medium to low duty cycles.

Media Size Range

The CHESS/64-0x class with 4 machines covers all widths from 25.4mm to 254mm with the same 300 dpi resolution. The length ranges from 5mm up to 2m independent of the finishing device. And even 15 m with an optional card is possible!

The Intermec XP class with 2 machines represents typical (but fast) 4 and 6-inch printers. No minimum width is specified. The length ranges from 8mm to 400mm, beyond that an optional card is needed. No minimum label size is specified when the accessories are attached but, given the design, it appears finishing devices will increase the minimum length of the label and non-imprintable area in 1:1 mode considerably.

Ribbon

The larger ribbon capacity of the CHESS/64-0x (600m vs. 450m) means less down time and operator monitoring even at the higher print speeds.

No minimum ribbon width is specified for the XP class.

Ribbon saver is standard for CHESS/64-0x class but not available for 501/601 XP class.

Print Head Check

The CHESS/64-0x will soon have a print head check feature available. It will monitor the head elements and, if a problem develops, try to automatically shift the format image so the bad element corresponds to a non-print position. If this is not possible the printer will stop and alert the operator. The check can be performed at the start and end of each job as well as at operator specified intervals. This will provide improved security for print quality and potentially extend print head life.

The XP also has a print head check system but with limited functionality. It cannot shift the image to avoid bad print head dots so the head life cannot be extended.

Connectivity

Centronics, RS 232/485 are standard for both printers. The CHESS/64-0x class runs a serial transmission speed of 115.2Kbaud for modern industrial requirements. The XP class is limited to 57.6 Kbaud only.

Options

Knife, rewinder and dispenser, external signal inputs and memory expansion cards are available for both printers. For the XP class it appears the media handling options increase the minimum length requirements but for the CHESS/64-0x this has no impact.

CHESS/64-0x class can be equipped as well with a scanner, an applicator and a front infeed module. Plus 2 output signals for integration and synchronization with other systems.

Physical Construction

Externally both brands have a steel case and a rugged construction design. For the XP class the internal design is not as rugged. The CHESS/64-0x class uses bearings instead of bushings, there are aluminium ribbon mandrels instead of plastic, large motors and gears and drive belts instead of less rugged devices, high precision parts instead of low cost items all leading to differences in terms of durability for high volume industrial applications.

Dimensions

The XP class housing has a much lower profile making access to the internals more difficult.

Design

Both brands have nice contours with curves, smooth edges, inclined surfaces and attention to design details—industrial isn't necessarily boring.

User Friendliness

The procedures to operate the unit including insertion of media and adjustment of parameters are much easier on the CHESS/64-0x class. Structured menus with simplified key selections make for easy adjustments and set-up of all operating parameters. The menu structure and shells of the 501/601 XP are much more complex and an operator can easily get lost.

Price and Maintenance Costs

On a total cost of ownership basis the CHESS/64-0x is expected to provide a better value. The more rugged construction and larger supplies capacity should provide higher productivity and throughput.

Detail Comparison

Print Quality at High Speed

The maximum print speed for both printers is rated at 12 ips print speed but the EasyCoder is only specified to run on lightweight, thin material.

One of the most relevant factors effecting print quality and print speed is media density (or thickness); the thicker the media, the worse the quality and the higher the abrasion with flat heads due to bending of the media underneath the head.

The EasyCoders, with their flat heads, appear to have specs indicating use for label printing only. They

can handle a material thickness up to 0.175mm, which corresponds to a density of approximately 180g/m². Almost any label reaches this limit (70-80g/m² backing paper, 70-90g/m² paper plus some adhesive), not to mention cardboard. Thus the print mechanism is always near its maximum rated load with labels and with cardboard it is overloaded. Poor print quality at high speeds, especially with wide material and standard cardboard is the result. The long-term effects of printing at maximum speed on maximum thickness materials are also a potential issue regarding machine reliability.

For high speed printing an extremely expensive ribbon is required and with a full ribbon and media roll, at 12 ips, problems with registration offset and media jams can be experienced.

The CHESS/64-0x printers are rated at 240g/m² for the 4", 5" and 6" heads and up to 300 gr/m² for the 4-inch head for special applications. But even with the same materials, the CHESS/64-0x printers, with its Near Edge print head and straight paper path, can run at maximum print speed with higher print quality in a wider variety of applications.

Both sides of the CHESS/64-0x print head mechanism are rigidly supported in ball bearing mounts, which gives added stability and optimum alignment under all operating conditions. Also the CHESS/64-0x print heads require less head pressure. This means reduced print head abrasion and less wear and tear on the mechanism. The end results are improved reliability, longer head life and better print quality.

Media Insertion, Width Adjustments and Media/Ribbon Transport Performance

For insertion of paper/ribbon the print engine of the EasyCoders can be opened from the side by means of a lever. A second lever needs to be adjusted manually to the width of the media in order to balance the head pressure for uniform print quality across the web.

For the CHESS/64-0x, the opening and closing of the head is done automatically as part of the basic operating modes and no secondary adjustments are required for different media widths. Plus the media can be conveniently fed through or removed from the print engine by pressing 2 keys on the operator's panel.

There are 4 advantages provided by this concept:

- No risk of forgetting to set the head offset adjustment for different paper widths and creating badly imprinted labels.
- No risk of prematurely worn down print heads due to wrong paper width adjustment.
- No risk of a flat spot on the print roller from leaving the head closed for a long period of time.
- No need to open/close the head mechanism by means of a lever i.e. one less operation and the printer is always ready.

The EasyCoders can handle 1.5", 1.6" or 3" media cores. A label roll retainer (lateral disk to keep roll on mandrel) is available as an option. For the CHESS/64-0x all of this is standard plus a 4" core can be accommodated to match a wider variety of applications.

The EasyCoders have a dancer arm to help accelerate the label roll and take up slack in the web. But it is small and not very effective at high speeds. The CHESS/64-0x printers have a long throw dancer providing better tension control thus leading to high registration accuracy at any speed even with slippery label liner material.

Lateral media guidance on the EasyCoders is less accurate as it is quite distant from the head and has a very short guide length. With the 64 0x/Chess the guides are long and close to the head. A high registration accuracy of +/- 0.5mm is guaranteed.

The TEC has a unique support for the ribbon supply core to help prevent ribbon wrinkling. The core support can be repositioned to any a small amount of "wobble" as it unwinds. It appears to work in most cases. But it requires experimenting by the operator for different widths can only be marginally effective in some cases. The solid roller multi-spindle design of the CHESS/64-0x printers is much more reliable and it does not need additional adjustments for different ribbon widths to operate effectively.

The EasyCoder has a spring-loaded backfeed for the ribbon (needed to provide on demand output i.e. backfeed of label from tear off point to print line). The design allows only one direction of rotation - ink side out ribbon. At higher speeds with backfeed there is noticeable ribbon slack, leading to unintended gray marks at the beginning of the ribbon or ribbon breakage due to a jam under the head. Furthermore, this limits the user to one unwind direction only. If the wrong unwind direction is used the ribbon backfeed operation may suffer or damage may occur. An untrained operator may cause some problems or even expensive repairs.

The CHESS/64-0x uses a stepper motor supported, maintenance free system that doesn't have these kinds of limitations and provides enhanced reliability. There are no restrictions on unwind direction – either ribbon ink side in or out be used. Also, the extra ribbon transport shaft between the head and ribbon rewinder provides consistent separation of the ribbon from the media resulting in excellent print quality and reliable operation and prevention of ribbon wrinkles.

Surprisingly, the EasyCoder printer doesn't have a ribbon saver, either as a standard feature or an option.

The CHESS/64-0x ribbon saver design uses a dual roller media feed system – one roller feeds material, the other is in use during the print process only. During ribbon save the head is lifted so there are no problems with ribbon wrinkles or head wear.

The EasyCoder has a factory adjusted, fixed ribbon torque system so using thin and/or narrow ribbon with large print areas may lead to ribbon breakage as the torque can't be lowered. Minimum ribbon width is specified as 35mm, which can add to operating costs for narrow web applications. The EasyCoder also only has a ribbon capacity of only 450m.

The CHESS/64-0x printers have adjustable ribbon unwind and rewind torque. This allows a minimum width of 30mm, or less if the torque is readjusted. The ribbon capacity is also significantly larger with a 90mm roll diameter providing a 600m length.

Fonts and Barcodes

15 scalable fonts are supported as standard on the EasyCoders.

CHESS/64-0x supports 2 scalable fonts (serif and sans serif) along with rotation in steps of 1 degree, plus bold and italic font styles. The capability to download True Type Font typefaces by the user will also be implemented soon.

Additionally, the CHESS/64-0x printers have, as standard, 17 fixed size fonts on board as well as 4 x 2D barcodes plus 12 x 1D barcodes. These internal fonts allow use of simple and quick format commands.

All of this allows the CHESS/64-0x to do the same job and even better!

Display, Menu and Operator Control

At first glance, the functionality of the EasyCoder keyboard/display appears to be richer than the CHESS/64-0x. However, most of the key functions are related to the integrated software for formatting and require more operator training and skill even for basic operation. The different available shells for the EasyCoders (operation by a Windows driver or a native label program) require different selections and may lead to confusion at the operator's side.

The CHESS/64-0x keyboard/display is simpler to operate yet provides more versatility. It requires less operator training and adjustments can be made more quickly. There are also 3 access levels that can be set to protect critical settings. Additionally features like the automatic gap initializing with manual mode allows adjusts for multicolored preprinted labels, which convinces even some TEC dealers to sell CHESS/64-0x printers in special applications.

The CHESS/64-0x printer's comprehensive list of error messages helps the operator with set-up and basic machine functions and allows the supporter to analyze problems via the phone saving both time and money. And the choice of format and/or manual control of the menu parameters is appreciated by everyone.

As well the keys on the front panel of the CHESS/64-0x printers are easy to access and operate.

The keys on the 170 Xill use membrane switches, and do not offer good tactile feel, making it slower and more difficult to operate.

Media Specifications

Thickness: For the EasyCoders the thickness or weight of paper should not be more than 0.175mm or approximately 180g/m² in order to "maintain" acceptable print quality. It certainly has questionable capabilities as a tag printer and is running at its limits as a label printer. CHESS/64-0x printers are proven up to 240g/m² and even 300g/m² at widths of 4 inches can be accommodated in special applications.

Length: The EasyCoder's label/tag minimum length is 8mm. No minimum label size is specified when the accessories are attached but, given the design, it appears finishing devices will increase the minimum length of the label and non-imprintable area in 1:1 mode considerably.

Maximum length is specified at 400 mm, which should be acceptable for most applications. However, the size of the print buffer memory at 65KB might be a bottleneck for printing graphics and the memory expansion option would be required.

CHESS/64-0x printers offer a standard minimum length of 5mm and this can be lowered if required. The minimum length is independent of what finishing device is attached. Neither cutter, dispenser nor tear off edge will raise this value due to its highly functional backfeed system.

Standard max length for the CHESS/64-0x exceeds 2 meters, which is more than adequate for most any application. No memory extension is normally required. The CL 612 max standard label length is only 178mm so memory expansion options will be required frequently.

Printing banners, i.e. extra long labels (maybe your next new sales opportunity) the CHESS/64-0x printers can be equipped with up to 32MB. Labels of up to 15 meter at 4 inch width can be printed in short time.

Connectivity

Both printers have both a parallel and serial interface as standard. CHESS/64-0x printers have a serial interface with 115.2KBaud max speed were the EasyCoder ends up with 57.6KBaud.

Maintenance

Print Head - The print heads are both designed to be easy replaced without tools.

For the EasyCoders a magnetic system is used to secure the head. It is not evident how the mechanism works and initially may lead to problems/doubts at reassembly due to the instability of the head in the mount.

For the CHESS/64-0x the color-coded mounting screws clearly indicate the proper procedure. The mount is pre-adjusted with high precision and does not need realignment. But if required the position can be readjusted for special applications. Also worth mentioning is that the Near Edge head on the CHESS/64-0x has a "self cleaning" characteristic. This provides better uptime and more consistent, high quality print even after long term use. And don't forget the longer head life, which results in lower operating costs.

Gap Sensor

The media sensor is nearly maintenance free on the CL 612 due to a transparent shield above the sensors. This however leads to a larger distance between the sensors and media, which reduces registration accuracy and may affect the ability to sense certain materials.

Options

Knife: A rotary knife is easy to install without tools but is limited to a maximum material thickness of only 0.175mm. It sits approx. 37mm from the print line which may lead to limitations in 1:1 demand mode.

The CHESS/64-0x has a fast and powerful modular knife and is only 20mm from the print line. The backfeed system is very accurate and allows a fully imprintable label in 1:1 demand mode. The knife is capable of cutting media up to 0.25mm thick and 4 inches wide making it appropriate even for tags. An average life of more than 1.5 million cuts even on critical TYVEK material can be expected.

Rewinder: The CHESS/64-0x rewinder module is:

- mounted externally for easy access and rewinds up to a diameter of 210mm. This saves operator time or the need for an additional separate rewinder,
- available in different core sizes so it matches the next step of the application,
- self-adjusting to print speed so no loose rolls or other mismatches.

None of the above features are provided by the internal rewinder on the 501XP. Access and low capacity are also significant limitations.

Dispenser: The EasyCoder printer pulls the backing paper directly from the internal rewinder roll which leads to inconsistent performance depending on the varying diameter of the roll. For regular paper labels with good die cut quality the performance is probably good enough.

For the CHESS/64-0x a separate feed roller/pressure roller combination pulls the backing paper around the dispense edge. This provides consistent performance for dispensing and excellent registration accuracy on most any label material.

Simply try to dispense a thin plastic label on a heavy backing paper and the difference will show up clearly. Or even more often, the die cut at the label isn't perfect. Even in

these cases your customer will see a reliability of performance probably never experienced before.

The dispenser of the CHESS/64-0x printers can be combined with our applicator unit. This isn't available on the Intermec products.

Memory Cards: For the CHESS/64-0x the new ATA card slot is standard and provides options up to 48MB of additional memory. This allows an incredible expansion of functions like selectable "auto-start" files, look up tables, an enormous quantity of additional fonts and graphics and an extremely large image buffer for extremely large labels.

The EasyCoder offers few of these features. For memory expansion a regular PCMCIA card is used and needs to have special formatting.

What EasyCoder printers don't have compared to CHESS/64-0x printers?

- Automatic print head dot check that can also shift the image in case a dot fails (the EasyCoder can not do the latter). This extends print head life and increases uptime.
- Rotation of scalable fonts in steps of 1 degree
- Good print quality at higher speeds
- Heavy duty drivers for the stepper motors that have reserve capacity even at the highest speeds
- High capacity power supply for high density printing even at 12 ips
- Modular boards for peripheral devices
- Ribbon Saver

What CHESS/64-0x printers don't have compared to EasyCoder?

- Built in software for off-line printer operation – this a scheduled feature on the CHESS/64-0x in year 2000.
- Gap sensor adjustable over 2/3rd of width and covered with protective shield – CHESS/64-0x has a full-size sensor option
- Optional ribbon low sensor – works with dedicated Intermec Fingerprint program only.
- Bar code wand interface for EasySet System, this facilitates the setup of the unit by means of preprinted EAN128 bar codes for different applications. For dedicated applications this will be of little value. For multi-purpose applications the CHES/64 0x has both operator selection of parameters (via the front panel) or automatic download of parameters (via the format). Both methods have advantages and disadvantages.
- Automatic interface detection for the serial/parallel ports
- Automatic detection of print head resistance and set-up of operating parameters.