Guide to Implementation of the

Ap25 Panel Mounting Printer

as an upgrade from the Ap24

(Provisional Document)

This document is a brief guide to the issues which may be encountered when upgrading from the Ap24 (which is now obsolete) to the Ap25 panel mount mini printer. Please read this document, and the Ap25 User Guide, very carefully before making any connection.

DIMENSIONAL DIFFERENCES

There are no external dimensional differences between the Ap24 and the Ap25.

CONNECTION DIFFERENCES

The external physical connections to the Ap25 are identical to those of the Ap24. However, some of the functions are modified slightly as detailed below.

FUNCTIONAL DIFFERENCES

1. Current monitoring hardware
2. Hardware selections only sampled at RESET
3. 8 bit capability, with full 7 bit backwards compatibility
4. Full 224 char IBM® char set (with full country specific char set backwards compatibility)
5. New 9600 baud rate capability
6. Larger 48 character data buffer with receive-while-print function
7. Improved CR / LF decoding

1. The Ap25 contains additional circuitry, which is designed to eliminate many of the electrical problems found with Ap24 printers. The main addition is a current monitor that will completely RESET the Ap25 if any printer solenoid is continuously energised, thus effectively preventing mechanism burn-outs. There should be no operational effect as a result of this additional protection.

2. In general the hardware select pins (e.g. Baud rate select, Parallel/Serial select, etc) are sampled once at RESET on the Ap25, whereas the Ap24 monitors these pins dynamically. The result of this is that if, for example, a baud rate change is required, then the Ap25 must be RESET.
This has special significance in the case of the hardware select pins being driven as outputs from a host where the host is RESET (or powered-up) at the same time as the printer. In this case it is important to consider the timing of the RESET process of the host and the printer.

3. The Ap25 is capable of handling full 8 bit data for both Parallel and Serial operation, whereas the Ap24 can only handle 7 bit data.
As with the Ap24, parallel or serial operation in the Ap25 is selected by the state of D7. If 8 bit parallel data is to be used, care must be taken to ensure that D7 is held low when the Ap25 is RESET.
The Ap25, when operated in serial operation, always expects data in the form *xxxx,N,8,1*
where xxxx = baud rate; N = No Parity; 8 = 8 data bits; 1 = 1 stop bit (regardless of character set). This may have some ramifications for the host. The host software for the Ap24 product may communicate at either 7 data bits and 1 stop bit or 7 data bits and 2 stop bits. The vast majority of hosts will communicate at 7 data bits and 2 stop bits and there should be no problem here: the new

Ap25 will simply see this configuration as 8 data bits and 1 stop bit, with the 8th data bit ignored. In the extremely unlikely event that a host communicates at 7 data bits and 1 stop bit, a revision to the host software would be required.

4. The Ap25 has nine character sets which may be selected for backward compatibility. The default character set is the IBM 224-character set. Previous versions of the Ap24 family have been supplied with 7 bit character sets: UK, French, German, "Scandinavian", Danish/Norwegian, Swedish, Japanese and Spanish character variations (often to special order). The Ap25 contains all these variants which are software selectable for backward compatibility. When using the IBM 224-character set, 8 data bits are used, when using other character sets the 8th data bit is ignored.

5. The Ap25 is capable of operating in serial mode at four hardware selectable baud rates in exactly the same way as the Ap24 is. However, one of the selections (110 baud), has been changed to 9600 baud. The hardware pin selections are different.

6. There are significant differences between the Ap24 and Ap25 in the way in which the busy signal operates.

In the Ap24, the busy goes active after each character is received and either goes inactive after a short delay or remains active whilst printing takes place. The busy is also asserted during paper feed operations. The Ap25 only asserts the busy signal high when the 48 character data buffer is "full". It is fully capable of receiving data while printing or feeding paper.

The Ap25 maintains a 48 character data buffer which improves overall print speed. The printer asserts the busy signal when the buffer contains 47 bytes. It is then still capable of receiving a single further character. This ability ensures that no characters are lost even when operating with very fast PCs with double-buffered UARTs, as could sometimes occur with the Ap24.

Unfortunately, some customers overcame the problem of occasional lost characters when using the Ap24 by sending multiple line terminator characters (i.e. CR or LF) at the end of character lines

7. There is a difference between the Ap24 and Ap25 products in the way that they handle the Line Feed (LF) and Carriage Return (CR) ASCII characters.

In the Ap24, if the host system transmits a LF or CR then a printout of that complete character message will occur. (i.e. the characters preceding the CR or LF and an automatic line feed). If the host system transmits both a LF and CR consecutively, then the complete character message will be printed and an extra automatic paper feed will occur (i.e. two line feeds in total).

In the Ap25, everything functions exactly the same as the Ap24 except in the case when LF and CR are received consecutively: in this case the Ap25 assumes that the host system has made an error and deletes the second line terminator. Therefore if LF and CR are received consecutively, the complete character message and a single automatic paper feed will be printed (i.e. not two line feeds).