Application 11: Configurable 512 channels of PWM controller

1. The PWM controller can provide the following functions:
   - The frequency can be as low as 40 Hz
   - The frequency can be as high as 2.5M Hz
   - The high level of PWM is programmable
   - The low level of PWM is programmable
   - Every controller provides two independent channels of PWM output
   - One PC can link to 256 PWM controllers max. in one RS-485 network. So there are total 512 channels of PWM output.

2. The hardware of PWM controller: 7188XC + X108
   - X1=channel_1
   - X2=GND
   - X3=channel-0

3. The firmware of PWM controller: 7521 with modification, open for reference

4. The specifications of X108: 3-channels of buffer from I/O expansion bus to X1, X2, X3

5. The command sets of PWM controller = 7521 + the following commands:

   (COM1 <-- exchange --> COM2)
   so COM1 will download program & accept Host-command
   So $aaB0115200 --> change COM1 to 115200
   So $aaB09600   --> change COM1 to   9600

   #aaA0 (freq) (high) (low) --> !aa chan_0 (freq) (high) (low) ↔ set pwm-0
   #aaB00     ↔ !aa chan_0 OFF    ↔ turn pwm-0 off
   #aaB01     ↔ !aa chan_0 On     ↔ turn pwm-0 on
   #aaC0     ↔ !aa (freq) (high) (low) (OnOff) ↔ read pwm-0 status

   #aaA1 (freq) (high) (low) ↔ !aa chan_1 (freq) (high) (low) ↔ set pwm-1
   #aaB10     ↔ !aa chan_1 OFF    ↔ turn pwm-1 off
   #aaB11     ↔ !aa chan_1 On     ↔ turn pwm-1 on
   #aaC1     ↔ !aa (freq) (high) (low) (OnOff) ↔ read pwm-1 status
6. The configuration of 2-channels PWM controller is given as follows:
   PC ← CA0910F → COM1 of 7188XC (with RS-232 interface) → for channel-0/1

7. The configuration of 512-channels of PWM controller is given as follows:
   PC ← 7520 → COM1 of 7188XC (with RS-485 interface) → for channel_0/1
   → COM1 of 7188XC (with RS-485 interface) → for channel_2/3
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   → COM1 of 7188XC (with RS-485 interface) → for channel_511/512