RS232/USB Interface for WF-700TK

User Manual

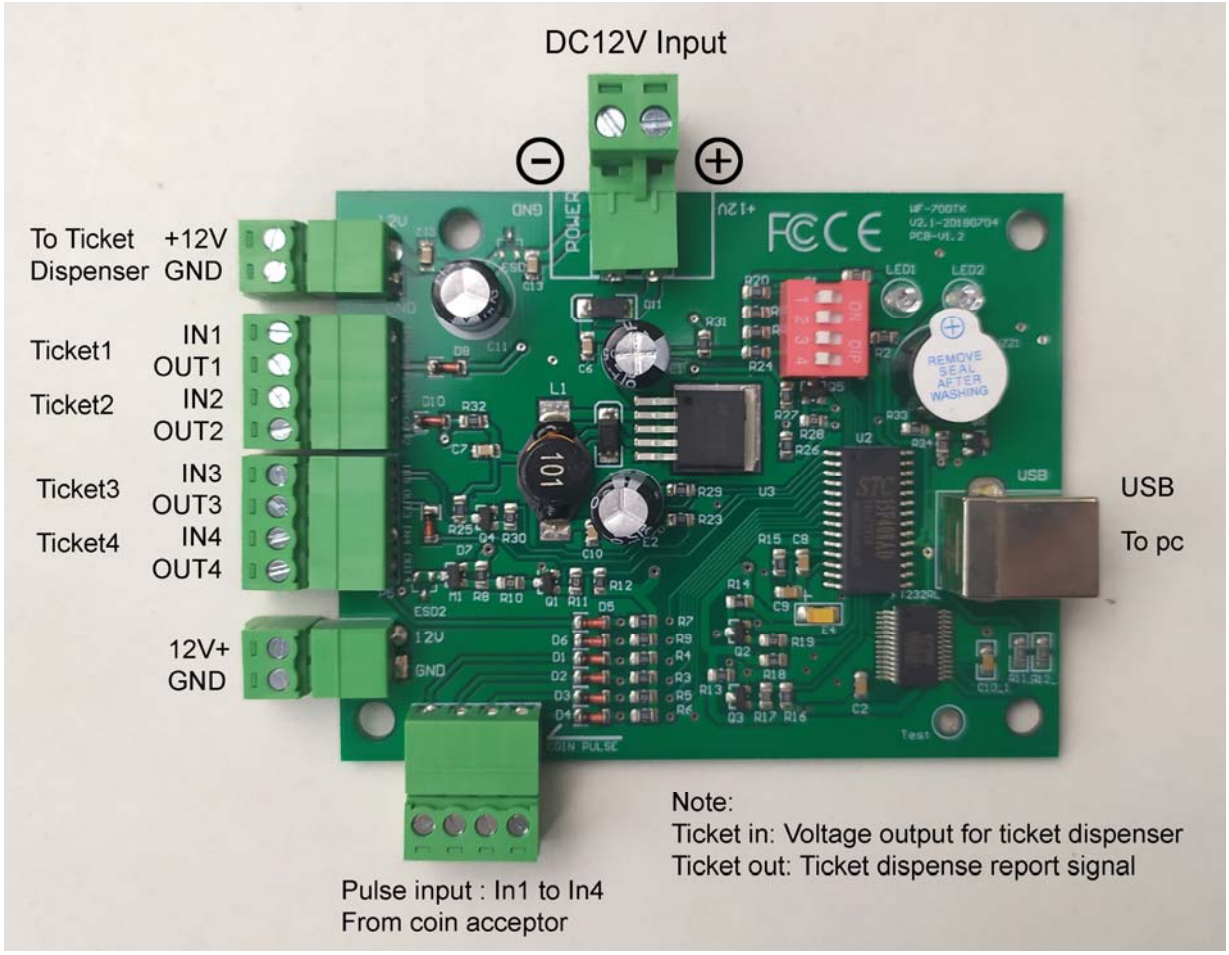
Version 1.2-2018-03-12

1.0 Introduction

The WF-700TK is an RS232 interface module for most pulse type coin acceptor or bill acceptor products. The WF-700TK has a built-in true RS232 port on its uplink communication port to interface with the serial port on a PC and a downlink port with inhibit power supply line with validators. With the WF-700TK, the end operator can treat all different kinds of validators as a standard RS232 device and can concentrate on the real operation of the validator rather than the tedious interface work of the hardware discrepancy.

The board can accept a total of four coin acceptors and four ticket dispensers. Each ticket issuing machine can be controlled separately.

On the PC platform, the software developer can easily program the validators via the WF-700TK with common computer languages such as Visual Basic / C++.



(Picture is the WF-700TK RS232 Version)

2.0 Compatibility

WF-700TK is a successor of the WF-700 model and the updated version of WF-700.

3.0 Features

- WF-700TK has four channels bill acceptor and coin acceptor credit pulse input. now the coin acceptor hardware interface is customized for single type pulse coin acceptor. And the payment device should select the Open-C pulse output
- Up to four ticket dispense machines can be connected and independently controlled.Also should select the right suitable ticket dispense.
- WAFER Provide technical support.

4.0 Communications

This interface is a three wire interface using a Transmit line (TXD), a receive line (RXD) and a Common line or a USB interface to PC. The Host machine is thought of as being the Master device. The WF-700TK is the slave device that responds only to the polls (or requests) from the Master.In this polled system, the Master requests information from the WF-700TK at a periodic rate. This rate can be as fast as every 100 milliseconds or as slow as the elapse time defined by the Lockout Timer. Faster rates are more desirable since overall system performance (in terms of bills/coins per minute accepted) will be higher at high poll rate system.

WF-700TK has a “Lockout” Timer feature that it will disable the acceptor if the specified poll rate is not met. In another words, if the host system is too busy to keep up with the desired minimum poll rate, WF-700TK will put the acceptors into the Disabled mode. The acceptor will be enabled again once the communication resumes.

5.0 GENERAL DATA

Baud Rate: - 9600
Duplex: - Half Duplex
Character Format: 1 start and 1 stop bit,,8 data bits (Bits 0 = sent first (LSB)

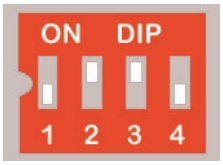
Lockout Timer

If the WF-700TK does not receive a poll after an elapse time specified by the hardware jumper, it will:

- ✧ Suspend (Disable) the acceptor.
- ✧ Return any note being held in escrow (if applicable)

This Lockout Timer has a selection of 1 second or no lockout specified by the setting of a DIP Switch.

For normal ,we select the 1s:



Credit stack, Parallel Mode

WF-700TK has a 6-level of credit stack in parallel mode. The stack is a FIFO type and holds up to 6 distinct credits and status information from the acceptor. On a slow polling system or whenever a communication loss occurs, credits issued by the acceptor are temporary stored in the WF-700TK ram and to be released to the Master on future polls. When the 2nd level of stack is entered, WF-700TK will disable the acceptor to avoid taking in any new tokens. Any credits already on the way sending from the acceptor will be piled up in the WF-700TK stack.

Pulse chain, Pulse Mode

WF-700TK has a pulse counter that can hold up to 261 pulses. Each pulse received from the acceptor is treated as an individual event. Thus, in another word, if a $20 dollar bill is accepted by a bill acceptor, 20 individual credits will be reported by the WF-700TK in 20 consecutive events in its uplink communication. If the number of pulses is larger than 261, and the system is not polling fast enough to clear the stack, a stack overflow situation will occur. In such a case, the WF-700TK will output the inhibit to Lock the coin selector.

Inhibit

After losing the communication connection with the host machine or PC, WF-700TK prohibits coin insertion by powering down the coin-operated equipment. The PC can also actively disconnect the communication to prohibit coin insertion.

6.0 MESSAGE FORMAT, UPLINK COMMUNICATION

Format: STX, Length, MSG Type and Ack #, Data Fields….., ETX, Checksum

Descriptions are as follows:

STX - 02h One byte indicating Start of message

LENGTH - One byte representation of the number of bytes in each message (binary), including the STX, ETX ,the Checksum and LENGTH

MSG TYPE and ACK # - One byte of Data

MSG Type - (Bits 4-6)

001 - for Master to WF-700TK Message

010 - for WF-700TK to Master Message

011 to 111 - reserved for future.

ACK # - (Bits 0-3)

00h

(So data from PC to WF-700TK will be 10h and from WF-700TK to PC will be 20h)

In the messages sent by Master, the Ack # is used to identify the message. The Ack # alternates between 00 and 01h. If the WF-700TK receisves two consecutive messages with the same number, the second message is treated as a retransmission of the first message.

In the messages sent by WF-700TK, the Ack # number is set the same as in the Master message to indicate the successfulness of the current message. If the WF-700TK receives a message incorrectly (wrong checksum), the received message will be discarded and no message will be sent back.

DATA - The data portion of the message consists of the multiple data fields. We will discuss it in the section of DATA FIELDS.

ETX - 03h One byte indicating End of message.

CHECKSUM - One byte checksum. The checksum is calculated on all bytes except the STX, ETX, and checksum byte itself. The calculation is done by XORing the bytes.

(Data from PC to WF-700TK ,checksum no need to be exactly calculated)

For example data:	02 0B 20 **01** 10 **01** 00 00 01 03 3A
Checksum	3A= 0B⊕20⊕01⊕10⊕01⊕00⊕00⊕01

6.1 PC-to- WF-700TK communications

Example: 02 08 10 03 00 00 03 77

(Checksum data from PC to WF-700TK , no need to be exactly calculated,so can always use 77h)

Data Fields (02 08 10 will be fixed data bytes):

BYTE 0

For WF-700TK

Set to 00H – Disable Bill acceptor and coin acceptor

Set to 03H – Enable payment input

Other data segment will be used when upgrading the device,Please consider follow-compatible design

02 08 10 00 00 00 03 77	Inhibit both acceptors
02 08 10 03 00 00 03 77	Enable both acceptors and Switch on the Relay output

BYTE 1

For WF-700TK

Control the ticket machine to output a certain number of tickets

02 08 10 03 **15** 00 03 77 (Channel 1 will output 5 tickets)

02 08 10 03 **39** 00 03 77 (Channel 3 will output 9 tickets)

The ticket dispense machine ticketing process is like this, WF-700TK output the voltage at the "IN" terminal, and then the ticket machine will start to issue the tickets if there is voltage, and each time a ticket is issued, it will output a pulse on "OUT". After WF-700TK counts a certain number of pulses on the "OUT" terminal, it will stop the voltage output of "IN" terminal, and the ticket machine will stop issuing tickets.

BYTE 2

For WF-700TK models

Set to 00h

6.2 WF-700TK-to-PC communications

After receiving the data polling command from the PC, WF-700TK will reply to the command.

Example: 02 0B 20 01 10 00 00 01 01 03 3A

Data Fields (02 0B 20 will be fixed data bytes):

BYTE 0

For WF-700TK

Set to 01h – Nothing to report

Set to 10h – Credit was accepted

BYTE 1

The number of tickets required to be output corresponding to the ticket machine channel

02 0B 20 01 **00** 00 00 00 **10** 03 3A	NO.1 channel,no need output
02 0B 20 01 **0E** 00 00 00 **21** 03 05	NO.2 channel need to output 15 tickets and already output 1
02 0B 20 01 **0F** 00 00 01 **30** 03 15	NO.3 channel need to output 15 tickets and rest it 0
02 0B 20 01 **00** 00 00 00 **40** 03 6A	NO.4 channel,no need output

BYTE 2

Pulse credit input

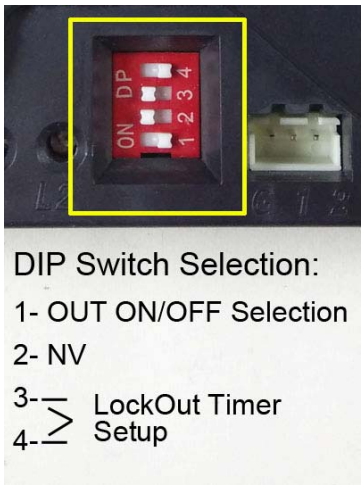
02 0B 20 10 00 **08** 00 00 40 03 73	Input1
02 0B 20 10 00 **10** 00 00 20 03 0B	Input2
02 0B 20 10 00 **18** 00 00 30 03 13	Input3
02 0B 20 10 00 **20** 00 00 10 03 0B	Input4

BYTE 5

Set to 01H

7.1 Default DIP SWITCH Settings

On board, There is one DIP switch which are set on the top of the WF-700TK.DIP switch is used for Power-on Relay ouput status,inhibit level setting and the inhibit timer setting.



Lockout timer DIP switch Configuration

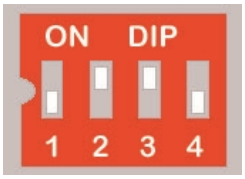
4	3	Lockout Time
OFF	OFF	No Lockout
OFF	ON	1 second
ON	OFF	1 second
ON	ON	1 second

For example:

Setting the DIP switch as the right picture:

Lockout Time is: One second

Other two switch is not available



7.2 Interface for Pulse bill or coin acceptor terminal

Totall has four input for pulse type payment device

Then split the wires to connect to your payment device.

If not sure how to connect, just contact : WAFER Service person for suggestions.

7.3 How to simply test the WF-700TK board

Download the test serial port tool from wafer website:

Check the "Regularly sent interval" option with 500ms/per

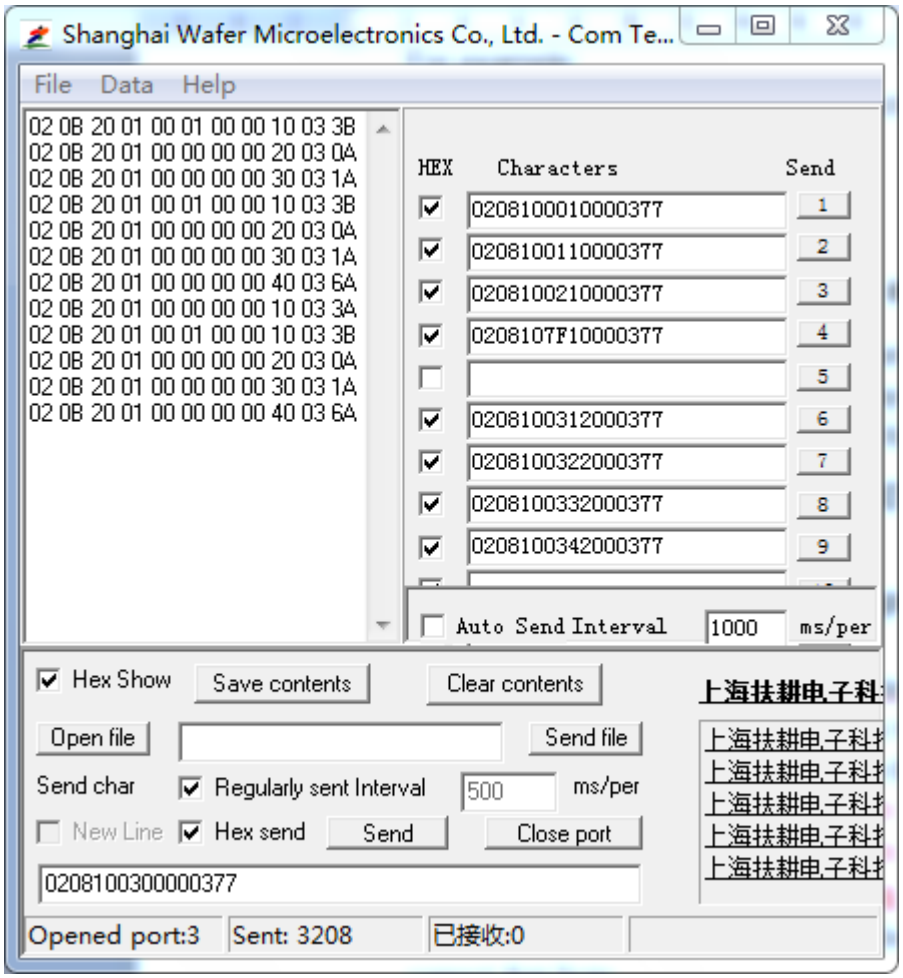
Check the "hex" send

Open the correct serial port

then com port tool will start to send the POLL command "0208100300000377" once every 500ms.

if give the pulse credit ,then the reply data from WF-700TK will be changed.

Also can press the hex command at the right command list for one time to dispense tickets.



7.4 Important for software development

✧ About the data received

When pc received the data bytes,sometimes will some interference bytes in front of the correct data,for example you should receive the " 02 0B 20 10 10 00 00 01 01 03 3A ",but in fact you maybe receive the following bytes in your com port:

FF 02 0B 20 10 10 00 00 01 01 03 3A

FE 02 0B 20 10 10 00 00 01 01 03 3A

FF FE 02 0B 20 10 10 00 00 01 01 03 3A

So must received the 02h and also followed with 0Bh, then will be determined as the correct data byte.

✧ Why I cann't input the coins after powered on the WF-700TK adapter box?

(1) Check the power supply is DC12V and properly connected to the WF-700TK terminal

(2) Even after powered on,if no PC polling data received,WF-700TK box will inhibit both acceptors

(3) Don't put the coin acceptor on the desk, because for all the coin acceptors if the previous coin is blocked in the exit,then the acceptor will be inhibited and cann't insert more coins.so you must keep the exit smooth when you start to insert the coin.


WF-700TK

7.5 Still have questions on “How to use the coin acceptor or bill acceptor ” ?

- Please read WAFER Technical Q&A web page: http://www.waferlife.com/en/technical-bulletin.html
- My payment devices are not parallel interface output, how can I connect to Computer ?
  WAFER has another adapter box,which can be used to connect the parallel pulse input to computer, For example, NRI,Comestero type
  Please go to order from: http://cnkiosk.aliexpress.com
- My payment device is MDB interface,how can I connect to Computer?
  Please use WAFER MDB-RS232,which is used to connect MDB payment device to PC, Please go to order from: http://cnkiosk.aliexpress.com
- How can I connect my serial interface or PC payment device to vending machine ?
  Please use WAFER RS232-MDB to do that for you, Please go to order from: http://cnkiosk.aliexpress.com

7.6 How to get a fast technical service ?

- Download the lastest files from: http://www.waferlife.com/en/PULSE-PC.html
- Please add online service skype: wafer-service
- Email us: wafer@waferstar.com
- Leave a message from online store : http://cnkiosk.aliexpress.com