UCON Training Protocol

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Overview

The following is an imaginary protocol for a barcode scanner. This protocol is to be used for UCON training and documentation.

Device Description

The scanner will read multi-dimensional barcodes. Each Barcode will contain a quantity, product name, product code, units, and unit price. The data will be returned with commas as delimiters. The unit can be configured to do solicited or unsolicited polling. In addition to the data that is provided by the barcode scan, you can also send read requests in solicited mode for the communication parameters (i.e. baud, parity, etc.), device ID, process mode and status.

In unsolicited mode, you can write to these to change them if the device is Off Scan. We will assume that the scanner is triggered by a sensor to scan when a package enters its station, and then send the data.

Data Packet Item Formats

Item	Description	Length	Range	Values		Data Type
<STX>	Start of Transmission	1 byte 0x02				
<ETX>	End of Transmission	1 byte 0x03				
<ACK>	Acknowledged Completion	1 byte 0x06				
<NAK>	Negative Completion	1 byte 0x15				
<Device ID>	ID of scanner	2 ASCII bytes	0-32			Word
<Process Mode>	Solicited or Unsolicited	1 ASCII byte	0-1	0= Solicited 1= Unsolicited		Word
<Status>	Scanner Status	2 ASCII bytes	0-255	**Bit 0**	0= Unlocked 1= Locked	Boolean
				Bit 1	0= Emitter Good 1= Emitter Failed	
				Bit 2	0= Sensor Good 1= Sensor Failed	
				Bits 3-7	Spares	
<Quantity>	Number of units	5 ASCII bytes	0-65535			Word
<Product Name>	Name of Product	Variable ASCII string				String
<Product Code>	SKU or PN	Variable ASCII string				String
<Units>	Type of Packaging	Variable ASCII string	Box, Ea, etc.			String
<Unit Price>	Price per Unit	Variable ASCII real				Float

<Baud Rate>	Baud Rate	5 ASCII bytes		1200 Baud 2400 Baud 4800 Baud 9600 Baud 19200 Baud 38400 Baud	Word
<Parity>	Data Parity	1 ASCII byte	0-2	0= None 1= Odd 2= Even	Byte

Command Codes

All commands are 1 byte in length.

Command	*ASCII Character*	*Hex*
Scan Station	]	0x1D
Get Process Mode	!	0x21
Set Process Mode	"	0x22
Get Status	#	0x23
Set Device ID	$	0x24
Get Baud Rate	%	0x25
Set Baud Rate	&	0x26
Get Parity	'	0x27
Set Parity	(	0x28

Solicited Read/Write Command Packet Structure

Command	*Packet Structure*
Read Request	<STX><Device ID><Command><ETX>
Read Response	<STX><Device ID><Command>,<Data1>,<Data2>,...<ETX>
Write Request	<STX><Device ID><Command><Data><ETX>
Write Response	<STX<Device ID><Command><Response><ETX>

Scan Station Command

For Device ID of 1:

Command	*Packet*	*ASCII Code*
Read Request	<STX>01]<ETX>	02 30 31 1D 03
Read Response-Barcode Present	<STX>01],00001,Twinkies,TW01,EA,0.35<ETX>	02 30 31 1D 2C 30 30 30 30 31 2C 54 77 69 6E 6B 69 65 73 2C 54 57 30 31 2C 45 41 2C 30 2E 33 35 03
Read Response-Barcode Absent	<STX>01]<NAK><ETX>	02 30 31 1D 15 03

Get Process Mode Command

For Device ID of 1 in Solicited Mode:

Command	*Packet*	*ASCII Code*
Read Request	<STX>01!<ETX>	02 30 31 21 03
Read Response	<STX>01!0<ETX>	02 30 31 21 30 03

Set Process Mode Command

For Device ID of 1 in Unsolicited Mode:

Command	*Packet*	*ASCII Code*
Write Request	<STX>01"1<ETX>	02 30 31 22 31 03
Write Succeeded	<STX>01"<ACK><ETX>	02 30 31 22 06 03
Write Failed	<STX>01"<NAK><ETX>	02 30 31 22 15 03

Get Status Command

For Device ID of 1 with Status of Running and No Errors:

Command	*Packet*	*ASCII Code*
Read Request	<STX>01#<ETX>	02 30 31 23 03
Read Response	<STX>01#00<ETX>	02 30 31 23 30 30 03

Set Device ID Command

Command	*Packet*	*ASCII Code*
Write Request	<STX>01$03<ETX>	02 30 31 24 30 33 03
Write Succeeded	<STX>01$<ACK><ETX>	02 30 31 24 06 03
Write Failed	<STX>01$<NAK><ETX>	02 30 31 24 15 03

Get Baud Rate Command

For Device ID of 1 with Baud at 9600:

Command	*Packet*	*ASCII Code*
Read Request	<STX>01%<ETX>	02 30 31 25 03
Read Response	<STX>01%09600<ETX>	02 30 31 25 30 39 36 30 30 03

Set Baud Rate Command

For Device ID of 1, Set to 19200:

Command	*Packet*	*ASCII Code*
Write Request	<STX>01&19200<ETX>	02 30 31 26 31 39 32 30 30 03
Write Succeeded	<STX>01&<ACK><ETX>	02 30 31 26 06 03
Write Failed	<STX>01&<NAK><ETX>	02 30 31 26 15 03

Get Parity Command

For Device ID of 1 with Even Parity:

Command	*Packet*	*ASCII Code*
Read Request	<STX>01'<ETX>	02 30 31 27 03
Read Response	<STX>01'2<ETX>	02 30 31 27 32 03

Set Parity Command

For Device ID of 1, Set to Odd:

Command	*Packet*	*ASCII Code*
Write Request	<STX>01(1<ETX>	02 30 31 28 31 03
Write Succeeded	<STX>01(<ACK><ETX>	02 30 31 28 06 03
Write Failed	<STX>01(<NAK><ETX>	02 30 31 28 15 03

Unsolicited/Write Packet Structure

When the device is configured to send the scan data on a remote triggered event, it will also send the unit status. If the scan is triggered and there is nothing in the station or there is an error, then you would get the station empty response and the appropriate Status Code. You will also still be able to do write commands to set some of the Scanner settings.

Command	*Packet Structure*
Unsolicited Response	<STX><Device ID>,<Data1>,<Data2>,...,<Status><ETX>
Write Request	<STX><Device ID><Command><Data><ETX>
Write Response	<STX<Device ID><Command><Response><ETX>

Station Scan Triggered Data and Status Good Running:

Command	*Packet*	*ASCII Code*
Device Send-Barcode Present	<STX>01,00001,Twinkies,TW01,EA,0.35,00<ETX>	02 30 31 2C 30 30 30 30 31 2C 54 77 69 6E 6B 69 65 73 2C 54 57 30 31 2C 45 41 2C 30 2E 33 35 2C 30 30 03
Device Send-Barcode Absent	<STX>01<NAK>00<ETX>	02 30 31 15 30 30 03