TECHNOLOGY SOLUTIONS UK LTD

TSL ASCII PROTOCOL 2.5

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Design • Development • Manufacture

CONTENT

History

VERSION	DATE	MODIFICATIONS
2.0 Rev A	29/04/2013	First Release
2.1 Rev A	25/07/2013	Added Monza extensions, Fast ID, Blockwrite and Tag focus. Minor document formatting changes. Correction to the .da example, date should input as yy not yyyy, Correction to the .ws and .wr commands, 32 words can be input not 16. Added AC: response field. Added Bluetooth® error code. Changed the barcode escape character and enabled it by default. Added BR response for barcodes when escape is disabled.
2.1 Rev B	1/10/2013	Correction to the Version Information Command – added missing 'RS:' to the valid response field headers section .wr command default -qv value corrected was 6 should be 4. Added hardware specific connection notes and minor typos corrected.
2.2 Rev A	16/5/2014	Amended the .rd –dl description to include the 253 word limit. Added the .lk command and LK: response. Fixed bug in .rd command which limited reads to a maximum 2032 bits. Fixed dropped bug in log when commanded from autorun file. Added –rd and –rs parameters to the .sa command to control the switch repeat delay. Added BA: response to the .vr command
2.3 Rev A	20/8/2014	Amended the .lk description to correct error in the maximum allowed length. Added ".sa –s ad –d ad -h" option for antenna determined switch action and haptic feedback. Added .hs and .hp commands for HID configuration. Added –ie an -fs parameters to .iv and .rd commands. Added –m parameter to .bt command.
2.3 Rev B	27/4/2015	.hd and .hs –td default parameter corrected .bt and .sa corrections ER:008 Modified to include Radio not fitted
2.4 Rev A	23/11/2015	Added .hc command Added EA:010 error code Changed .rl to allow –c off option from autorun Added no.log file to stop all logging .st –h minimum timeout changed to 1 second Added –qm option to .rd and .wr commands to support Tag QT command Added QT: and IA: response fields Added .mt command and no.mnt file to prevent FS mounting.
2.4 Rev B	06/05/2016	Added –e option to the .bt command
2.4 Rev C	17/06/2016	Added –m hii option to the .bt command
	07/12/2016	Added -ar, -cm, –ma, -n, -p, -x options to the .sl command
	13/03/2017	Started to add block permalock command
2.5 Rev A	04/05/2017	Renamed as 2.5 rev A
	01/06/2017	Documented BV: response
	28/03/2018	Added BV: header to .vr response Added .ar command Added new parameters to .fd (2128 only)
	25/02/2019	Documented new response headers: HB: HF: HS: PH: CF: BH: RP: Added .ft command
	12/03/2019	Added .iv -dr for duplicate removal (2128/2166)
	18/03/2019	Added .hc -kb xx HID international keyboards

INTRODUCTION

This document describes the Technology Solutions ASCII 2 protocol. The commands and their parameters are detailed along with the responses. Each command has a few examples to aid understanding. The commands all have default parameters and most can be used without change.

It is important to note that this document is not a transponder tutorial and users should have a basic understanding of UHF Class 1 Gen 2 transponders.

The latest UHF Class 1 Gen 2 Standard is available for download from
http://www.gs1.org/gsmp/kc/epcglobal/uhfc1g2

COMMANDS OVERVIEW

All commands start with a period (.)(0x2E) followed by 2 lower case characters.

Commands should be terminated with a Carriage Return<CR>, a Linefeed<LF> or a combination of the two. All combinations are acceptable <CR>,<LF>,<CRLF> or <LFCR>.

Command echoing can be enabled with the .ec command. This is useful for testing commands with a terminal program but generally should be avoided particularly over the *Bluetooth*® interface where it will impact throughput.

Commands are parameterised with the parameters preceded by a minus sign (-)(0x2D)
e.g.

```
.rd -a00000000 -bu
```

Some parameter values need to be enclosed in double quotes (“)(0x22).
e.g.

```
.bt -f “1128-EU-000001”
```

All parameter values are stored in the reader, if a parameter is not included the stored value will be used.

When a command uses a parameter its stored value is updated.

When the reader is powered up the stored values are loaded with defaults with the exception of the .bt command whose settings are persistent.

The parameter -x restores the stored parameters to their default values.

The parameter -n prevents the command from taking any actions, other included parameters will be stored. This allows parameters to be saved without the command being performed.

The parameter -p displays the current values of the supported parameters. Any other parameters included will be stored first.

Once the command has started (. detected) a gap of greater than 30 seconds will cause an error response to be sent.

Spaces (0x20) in commands are ignored unless in quotes.

The command . will repeat the last command.

COMMAND PARSER

The Command Parser is fairly simple, only the expected parameters are validated, anything else will be ignored.

For example the following two commands will perform the same.

. al –v off

.al this text is ignored –v off so is this

This is quite a useful feature as it can be used to identify the source of a command.

As an example, there may be a need to distinguish between a command issued over the USB interface and one issued from a trigger press. To achieve this, the commands sent via the USB interface could have “USB” inserted into the commands and then the .CS response can be used to separate the responses.

e.g.

Command from USB:

.iv USB

Response to command from USB:

CS: .iv USB

EP: 310833B2DDD906C000001234

EP: 341486E37C00000000004255

EP: 341486E37C00000000004254

OK:

Response to .iv command issued from a switch press:

CS: .iv

EP: 310833B2DDD906C000001234

EP: 341486E37C00000000004255

EP: 341486E37C00000000004254

OK:

If individual commands need to be identified a sequential numeric identifier could be used.

RESPONSES

Responses can return multiple values so field headers are used to separate the data.

Field headers are two upper case characters followed by a colon (:) (0x3A).

Each field is terminated by a Carriage Return Linefeed pair.

All responses end with either “OK: ” or “ER:nnn”

For example, a typical response to the .vr command is:

```
CS: .vr
MF: TSL UK Ltd.
US: 2128-000001
UF: 1.3.3
UB: 1.0.6
PV: 2.5.0
RS: 00000012-46464306-20303333
RF: 1.6.8.3
RB: 1.6.8.3
IA: 1.6.8.240
AS: 1128-S1-US-002911
BA: 88:6B:0F:31:90:03
BV: 1.0.6
OK:
```

RESPONSE FIELD HEADERS

AB: Autorun File Begin

This field header indicates the beginning of the Autorun file.

Format:

AB: optional text

Examples:

AB: **** Beginning of Autorun file ****

AC: Authentication Chip Test

This field header indicates the result of the test on the authentication chip.

Format:

AC: Passed/Failed/NotPresent

Examples:

AC: Passed

AE: Autorun File End

This field header indicates the end of the Autorun file.

Format:

AE: optional text

Examples:

AE: **** End of Autorun file ****

AS: Antenna Serial Number

This field header precedes the antenna serial number.

Format:

AS: “Antenna serial number”

Examples:

AS: 1128-S1-EU-000001

BA: *Bluetooth*® Address

This field header precedes the *Bluetooth*® address.

Format:

BA: "*Bluetooth*® Address"

Examples:

BA: 00:07:80:41:a4:c6

BC: Barcode Data

This field header precedes the barcode value when escape characters are enabled (default).

Since some barcodes can contain the termination characters the use of an escape character, <ESC> (0x1B), is used to distinguish between a Cr Lf sequence contained in the Barcode and the real termination characters. Should the escape character be read as part of the barcode it will be escaped as well.

Format:

BC: "Barcode Value"

Examples:

Example using escape character to read the following barcode data

"abc<ESC>123456789<CR><LF>abcdef"

BC: abc<ESC><ESC>123456789<ESC><CR><ESC><LF>abcdef

BH: Battery Health

This field header precedes the Power Handle battery health information. (2128 only, where fitted).

Format:

BH: PH vo=voltage dc=designcap fc=fullcap rc=remcap cc=chargecycles sh=stateofhealth

Examples:

BH: PH vo=4179 dc=6500 fc=6530 rc=6530 cc=4 sh=100

BP: Battery Percentage Level

This field header precedes the battery level value.

Format:

BP: “Battery level Value”

Examples:

BP: 100%

BP: 78%

BP: 4%

BR: Barcode Raw

This field header precedes the barcode value when escape characters are disabled. Care must be taken since some barcodes can contain the termination characters.

Format:

BR: “Barcode Value”

Examples:

BR: ISBN:5884688-6686

BV: Bluetooth® Version

This field header precedes the Bluetooth® firmware version.

Format:

BV: “*Bluetooth*® Version”

Examples:

BV: 560

CF: Channel Frequency

This field header precedes channel frequency (Hz) used.

Format:

CF: “frequency”

Examples:

CF: 924750

CH: Charge Status

This field header precedes charge status.

Format:

CH: Off/Charging/Complete/Error

Examples:

CH: Complete

CR: Transponder EPC CRC Value

This field header precedes Transponder EPC CRC value (in hex).

Format:

CR: “CRC Value”

Examples:

CR: 3E4F

CS: Command Started

This field header is sent to indicate that a command has started. It precedes the command that initiated it.

Format:

CS: “Command”

Examples:

CS: bc -t 6

DA: Date

This field header precedes the Date, in ISO 8601 extended format.

Format:

DA: “Date”

Examples:

DA: 2013-01-24

DP: Double Press User Defined Switch Action

This field header precedes the action that will be executed when “.sa -d usr” is configured.

Format:

DP: Switch command

Examples:

DP: .bc -t4

DP: .iv

DT: Date/Time Stamp

This field header precedes the Time Stamp, in ISO 8601 extended format.

Format:

DT: “Date/Time Stamp”

Examples:

DT: 2013-01-24T13:12:16

EA: Transponder Access Error Code

This field header precedes the Transponder access error code. Access errors are generated by the reader while trying to access a transponder and apply to the transponder with the preceding EPC value.

Format:

EA: nnn nnn = 000 to 255

Error codes:

001 Handle mismatch.
002 CRC error on transponder response.
003 No transponder reply.
004 Invalid password.
005 Zero kill password.
006 Transponder lost.
007 Command format error.
008 Read count invalid.
009 Out of retries.
010 Access error.
255 Operation failed.

Examples:

EA: 004

EA: 006

EB: Transponder Backscatter Error Code

This field header precedes the Transponder backscatter error code. Backscatter errors are generated by the transponder and apply to the transponder with the preceding EPC value.

Format:

EB: nnn nnn = 000 to 255

Error codes:

000 General error.
003 Memory does not exist or the PC value is not supported.
004 Memory is lock or permalocked.
011 Transponder has insufficient power.
015 Transponder does not support error specific codes.

Examples:

EB: 003

EB: 011

EP: Transponder EPC Value

This field header precedes Transponder EPC value (in hex).

Format:

EP: “EPC Value”

Examples:

EP: 000000000000000000000010E6

ER: Error

This field header is used to terminate the response to an unsuccessful command.
It is always followed by a three digit error code then two Carriage return Linefeed pairs.

Format:

ER: nnn nnn = 000 to 255

Error codes:

001 Syntax Error.
002 Parameter not supported.
003 Action not enabled.
004 Command not supported by hardware
005 No transponder found
006 No Barcode found
007 Parameter configuration invalid
008 Antenna/Radio Error (Wrong region or Antenna/Radio Not Fitted)
009 Battery level too low
010 Scanner not ready
011 Command not supported on interface
012 Command not supported from Autorun file
013 Write Failure
014 Switch already in use
015 Command Aborted
016 Lock Failure
017 *Bluetooth*® Error
018 Licence Key is not blank
255 System Error.

Examples:

ER: 001

ER: 004

FN: *Bluetooth*® Friendly Name

This field header precedes the *Bluetooth*® friendly name.

Format:

FN: "*Bluetooth*® Friendly Name"

Examples:

FN: 1128-EU-000001

IA: UHF API Version

This field header precedes the UHF API version number used for identifying the API in use.

Format:

IA: "UHF API version number"

Examples:

IA: 1.5.0.10

HB: Power Handle Bootloader Version Number

This field header precedes the Power Handle bootloader version number. (2128 only, when fitted).

Format:

HB: "Power Handle bootloader version number"

Examples:

HB: 1.0.0

HF: Power Handle Firmware Version Number

This field header precedes the Power Handle bootloader version number. (2128 only, when fitted).

Format:

HF: "Power Handle firmware version number"

Examples:

HF: 1.0.0

HS: Power Handle Serial Number

This field header precedes the Power Handle serial number. (2128 only, when fitted)

Format:

HS: “Power Handle serial number”

Examples:

HS: 2102-000001

IX: Index Number

This field header precedes an index number used for referencing multiple responses to a command.

Format:

IX: 4 digit ASCII hex Index number

Examples:

IX: 004A

KS: Kill Success

This field header indicates the kill command has succeeded.

Format:

KS: Kill Success

Examples:

KS: Kill Success

LB: Log Begin

This field header indicates the beginning of the log.

Format:

LB: optional text

Examples:

LB: **** Beginning of Log ****

LE: Log End

This field header indicates the end of the log.

Format:

LE: optional text

Examples:

LE: **** End of Log ****

LE: **** End of Block ****

LL: Log Length

This field header precedes the length of the log file in bytes.

Format:

LL: 8 digit ASCII hex Index number

Examples:

LL: 0000004A

LK: Licence Key

This field header precedes the licence key string. Any printable ASCII characters are allowed.

Format:

LK: licence Key

Examples:

LK: IamAlicenceKey

LS: Lock Success

This field header indicates the lock command has succeeded.

Format:

LS: Lock Success

Examples:

LS: Lock Success

ME: Message

This field header precedes message text. It usually precedes the ER: field header to provide additional error information.

Format:

ME: “Message text”

Examples:

ME: “Vibration not supported”

MF: Manufacturer Name

This field header precedes the manufacturers name.

Format:

MF: “Manufacturer name”

Examples:

MF: Technology Solutions UK ltd.

OK: OK Response

This field header is used to terminate the response to a successful command.
It is always followed by two Carriage return Linefeed pairs.

Format:

OK:

Examples:

OK:

QT: QT Control Word

This field header precedes the 16 bit QT control word (in hex).

Format:

QT: “QT Value”

Examples:

QT: 4000

PC: Transponder EPC PC Value

This field header precedes Transponder EPC PC value (in hex).

Format:

PC: “PC Value”

Examples:

PC: 3000

PH: Phase

This field header precedes tag phase (degrees) used.

Format:

PH: “phase”

Examples:

PH: 135

PR: Parameters

This field header precedes parameter values.

Format:

PR: “Parameter Values”

Examples:

PR: -v on -b off

PV: Protocol Version Number

This field header precedes the protocol version number.

Format:

PV: “Protocol version number”

Examples:

PV: 2.5.0

RB: Radio Bootloader Version Number

This field header precedes the radio bootloader version number.

Format:

RB: “Radio bootloader version number”

Examples:

RB: 1.2.0

RD: Transponder Read Data

This field header precedes data read from a Transponder (in hex).

Format:

RD: “Read Data”

Examples:

RD: 0F078010

RF: Radio Firmware Version Number

This field header precedes the radio firmware version number.

Format:

RF: “Radio firmware version number”

Examples:

RF: 2.6.0

RI: Transponder RSSI Value

This field header precedes Transponder RSSI value in dBm.

Format:

RI: “RSSI Value”

Examples:

RI: -63

RS: Radio Serial Number

This field header precedes the radio serial number.

Format:

RS: “Radio serial number”

Examples:

RS: 1116-ET-000001

RP: RSSI Percentage

This field header precedes Transponder RSSI value as a percentage.

Format:

RP: “percentage”

Examples:

RP: 58

SP: Single Press User Defined Switch Action

This field header precedes the action that will be executed when “.sa -s usr” is configured.

Format:

SP: Switch command

Examples:

SP: .bc -t4

SP: .iv

SR: Set Region

This field header precedes the currently selected region.

Format:

SR: region Code

Examples:

SR: us

SR: eu

SW: Switch Status

This field header precedes the switch state value.

Format:

SW: “off/single/double”

Examples:

SW: single

SW: off

TD: Transponder TID Value

This field header precedes the Transponder TID value (in hex).

Format:

TD: “TID Value”

Examples:

TD: 1C2B3A495867768594A3B2C1

TM: Time

This field header precedes the Time, in ISO 1601 extended format.

Format:

TM: “Time”

Examples:

TM: 13:12:16

UB: Unit Bootloader Version Number

This field header precedes the unit bootloader version number.

Format:

UB: “Unit bootloader version number”

Examples:

UB: 1.2.0

UF: Unit Firmware Version Number

This field header precedes the unit firmware version number.

Format:

UF: “Unit firmware version number”

Examples:

UF: 2.6.0

US: Unit Serial Number

This field header precedes the unit serial number.

Format:

US: “Unit serial number”

Examples:

US: 1128-EU-000001

WW: Number of Words Written

This field header precedes the number of words successfully written by a transponder write command.

Format:

WW: nn

Examples:

WW: 3

FILES ON SD CARD

On wake up the default configuration is loaded. If the “auto.txt” file is present on the SD card it is executed as if sent from a host. This may overwrite some or the entire loaded configuration.

Files on SD

AUTO.TXT	Script which runs on start up
LOG.TXT	Event log file
no.log	If present all logging is disabled
no.mnt	If present it prevents the internal memory from automatically mounting when a USB connection is established.
Kbd_rr.hid	A language specific keyboard mapping for HID mode where rr is the two letter ISO code for the country

.ab Abort Command

Abort command, terminates the current command and any pending commands. It also stops any software switch presses that are in progress.

Parameters:

No parameters are used for this command.

Valid response field headers:

CS: ER: ME: OK:

Examples:

Command	Response	Action
.ab	CS: .ab OK:	Abort complete

.al Alert Command

Configures and alerts the user. Returns an error if vibrate and buzzer are both off.

Parameters:

-b on/off	Buzzer on or off
-d sho/med/lon	Buzzer/Vibrate duration short, medium or long
-fm	Plays “Find-Me” tune
-l low/med/hig	Volume level
-n	No action, just set the parameters
-p	List the current parameter values
-t low/med/hig	Buzzer tone low, medium or high
-v on/off	Vibrate on or off
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted in the following order.

-x, -fm, -b, -d, -l, -t, -v, -p, -n

Parameter defaults

The parameter defaults are:

-b on,-d sho, -l hig, -t hig, -v on,

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.al -bon -voff	CS: .al -bon -voff OK:	Buzzer sounds
.al -p -n	CS: .al -p -n PR: -b on -d sho -l hig -n -p -t hig -v off -x OK:	None
.al -boff -voff	CS: .al -boff -voff ME: Buzz and Vibrate are both off ER:003	None

.ar Autorun Command

If supported by the reader, this command is used to read/write/delete/execute the AUTO.TXT file on the SD card, or the readers small, internal file. This command cannot be used in an Autorun file. NB The internal file is limited to 256 bytes.

Parameters:

-d yes	Delete the specified autorun file
-ea	Execute specified autorun file
-fi 0/1	Select autorun file (0=internal, 1=SD card)
-ra	Read specified autorun file
-wa "*command*"	Append *command* to the specified autorun file
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted in the following order.

-x, -fi, -d, -wa, -ra, -ea

Parameter defaults

The parameter defaults are:

-fi 1

Valid response field headers:

CS: ER: AB: AE: ME: OK:

Potentially any other response field could be contained in the log file.

Examples:

Command	Response	Action
.ar -d yes	CS: .ar -d yes OK:	The autorun file is deleted
.ar -wa ".al -voff -n"	CS: .ar -wa ".al -voff -n" OK:	The ".al -voff -n" command is appended to the end of the autorun file. (This command is turning off the vibrate at wake up)
.ar -ra	CS: .ar -ra AB: Autorun file data AE: OK:	The autorun file is read
.ar -ea	CS: .ea OK:	The autorun file will be run

.bc BarCode Command

Initiates a barcode read.
Returns an error if no barcode is read.

Parameters:

-al on/off		perform an alert after a successful barcode read using the current alert parameters from the .al command
-dt on/off		Include date time response
-e on/off		Use escape character 0x1B to precede <CR>, <LF> and itself
-n		No action, just set the parameters
-p		List the current parameter values
-t n	n=1..9	Read duration in seconds
-x		Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -al, -e, -dt, -t,-p, -n

Parameter defaults

The parameter defaults are:

-al on, -dt off, -e on, -t 9

Valid response field headers:

BC: BR: CS: DT: ER: ME: OK: PR:

Examples:

Command	Response	Action
.bc	CS: .bc BC: ISBN:5884688-6686 OK:	Barcode reads
.bc -e off	CS: .bc -e off BR: ISBN:5884688-6686 OK:	Barcode reads with escape disabled
.bc	CS: .bc ME: No barcode found ER:006	Barcode fails to read
.bc -p -n	CS: .bc -p -n PR: -al on -dt off -e on -n -p -t 9 -x OK:	None

.bl Battery Level Command

Returns Battery level as percentage and Charge status.

Parameters:

-bh Report battery health information.

Valid response field headers:

CH: CS: BH: BP: ER: ME: OK:

Examples

Command	Response	Action
.bl	CS: .bl BP: 100% CH: Complete OK:	None
.bl	CS: .bl BP: 30% CH: Charging OK:	None
.bl	CS: .bl BP: 7% CH: Off OK:	None

.bp Block Permalock Transponder Command

This command is used to read or write the block permalock status on supported transponders. Block permalock is an optional command in the Class 1 Generation 2 Air Protocol so requires both the reader and the transponder to support the block permalock command for it to be used.

With block permalock the user memory of a transponder is split into several manufacturer defined blocks. These blocks each have a write protect bit which can be set but NOT reset (hence permalock). The block permalock command can be used to read the status of these permalock flags or to write them.

To read the permalock flags specify the start index offset (-do) and the number of blocks (-dl) to read the status of. The returned data is a bit pattern of lock status, 1 for locked 0 for not locked.

To write the permalock flags specify the start index offset (-do), the number of blocks (-dl), the mask of the blocks to lock (-dm). Setting the bit index for the block permalock to 1 will permalock the block, setting to 0 will leave the block in its current state (permalocked or not).

Parameters:

-al on/off	Perform an alert after a successful write using the current alert Parameters from the .al command
-ap xxxxxxxx	Access password, where xxxxxxxx is an 8 character ASCII Hex value
-c on/off	Include EPC checksum response
-dm xxxx..zzzz	The mask data of blocks to lock in 4 character ASCII Hex words. Up to a maximum of 16 words
-dl xx	Length in words of the data to read or write, where xx is a 2 character ASCII Hex value up to a maximum of 10hex
-do xxxx	Mask data offset specifies the starting address for the mask, in units of 16 manufacturer defined blocks, where xxxx is a 4 character ASCII Hex value
-dt on/off	Include date time response
-e on/off	Include EPC PC information response
-io on/off	Inventory only, if set to on then no select will be performed before the inventory round phase is started
-ix on/off	Index number each transponder response
-m rd/wr	Set the mode to either read (rd) the block permalock status or write (wr) the block permalock bits
-n	No action, just set the parameters
-o nn	Output power in dBm, where nn is in the range 10 to 29
-p	List the parameter and their current values
-ql all/nsl/sl	query Select
-qs s0/s1/s2/s3	query Session
-qt a/b	query Target
-qv nn	Q value (0..15)
-r on/off	Include transponder RSSI response

-sa n Select action

Parameter n=	Matching Action		Non Matching Action	
	SL Flag	Session Flag	SL Flag	Session Flag
0	assert	Set A	deassert	Set B
1	assert	Set A	nothing	nothing
2	nothing	nothing	deassert	Set B
3	toggle	toggle	nothing	nothing
4	deassert	Set B	assert	Set A
5	deassert	Set B	nothing	nothing
6	nothing	nothing	assert	Set A
7	nothing	nothing	toggle	toggle

-sb epc/tid/usr Bank to use for the select mask

-sd xx..zz Select mask data in 2 character ASCII Hex bytes padded to ensure full bytes, up to a maximum of 32 bytes.

-sl xx Length in bits of the select mask, where xx is a 2 character ASCII Hex value

-so xxxx Number of bits from the start of the block to the start of the select mask, where xxxx is a 4 character ASCII Hex value

-st s0/s1/s2/s3/sl Select target

-x Reset the parameters to defaults

Parameter interpretation order:

The parameters are interpreted and applied in the following order.

-x, -al, -c, -e, -m, -r, -dt, -ix, -sb,-so, -sl, -sd, -o, -io, -sa, -st, -ql, -qs, -qt, -qv, -dl, -dm, -do, -ap, -p, -n

Parameter defaults:

The parameter defaults are:

-al on, -ap 00000000, -c off, -dm, -dl 00, -do 0000, -dt off, -e off, -io off, -ix off,
-m rd, -o 29, -ql all, -qs s2, -qt b, -qv 4, -r off, -sa 4, -sb epc, -sd, -sl 00, -so 0000, -st s2

Valid response field headers:

CR: CS: DT: EA: EB: EP: ER: IX: ME: OK: PC: PR: RI: LS:

Examples

Command	Response	Action
.bp -x -sd1166FFFFAAAAFFFF -sl40 -so0020 -m wr -dl01 -do0000 -dm1000	CS: .bp -x -sd1166FFFFAAAAFFFF -sl40 -so0020 -m wr -dl01 -do0000 -dm1000 EP: 1166FFFFAAAAFFFF LS: Lock Success OK:	Block permalock block 3 of transponder with EPC 1166FFFFAAAAFFFF
.bp -x -sd1166FFFFAAAAFFFF -sl40 -so0020 -m rd -dl01 -do0000	CS: .bp -x -sd1166FFFFAAAAFFFF -sl40 -so0020 -dl01 -do0000 -m rd EP: 1166FFFFAAAAFFFF RD: 0000 OK:	Read the block permalock status of transponder with EPC 1166FFFFAAAAFFFF (no blocks locked)

.bt *Bluetooth*® Functions

Reads the *Bluetooth*® address, additionally the *Bluetooth*® can be reset and configured. This command is only available over the USB interface and cannot be used in the Autorun file.
Settings made with this command are persistent and not reset to defaults at power up.

Parameters:

-bi "bundleID"	set iOS Bundle ID, up to 80 characters, enclosed in double quotes (")
-e on/off	Turn *Bluetooth*® on or off
-bs "BundleSeedID"	set iOS Bundle Seed ID, 10 characters enclosed in double quotes (")
-f "name"	set the *Bluetooth*® friendly name, up to 20 characters, enclosed in double quotes (")
-m spp/hid/hii	Set Bluetooth® for either HID or SPP mode, x is implied as a full reset will be performed. (hii is HID with iOS keyboard pop, this option may cause issues with Android 5 and 6)
-p	List the available parameters (not their values)
-w nnnn	The pin for legacy *Bluetooth*® pairing
-x	reset *Bluetooth*® settings to defaults for current mode (HID or SPP)

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-m, -x, -f, -e, -bi, -bs, -p, -w

Parameter defaults

-bi “TSL demo app Bundle ID”, -e on, -bs “TSL demo app Bundle Seed ID”,
-f “unit serial number”, -m spp, -w 0000, -x

Valid response field headers:

AC: BA: BV: CS: ER: FN: ME: OK: PR:

Examples:

Command	Response	Action
.bt	CS: .bt BA: 00:07:80:41:a4:c6 FN: 2128-000001 AC: Passed OK:	The *Bluetooth*® address and friendly name is read and the authentication chip is working.

.da Date Command

Reads or sets the date.

Parameters:

-s yymmdd Set the date

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-s

Parameter defaults

No parameter defaults are required:

Valid response field headers:

CS: DA: ER: ME: OK:

Examples:

Command	Response	Action
.da	CS: .da DA: 2012-11-05 OK:	The date is read
.da -s 130120	CS: .da -s 130120 DA: 2013-01-20 OK:	The date is set

.dp User Defined Switch Double Press Action

Reads or sets the double press user action used when ".sa -d usr" is configured.

Parameters:

-s user action command Set the user action

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-s

Parameter defaults

No parameter defaults are required:

Valid response field headers:

CS: ER: ME: OK: DP:

Examples:

Command	Response	Action
.dp	CS: .dp DP: .bc OK:	User action is read
.dp -s .iv	CS: .dp -s .iv DP: .iv OK:	User action is set

.ea Execute Autorun Command (Deprecated)

This command will force the autorun file to run.

Parameters:

No parameters are used for this command.

Valid response field headers:

CS: ER: ME: OK:

Examples:

Command	Response	Action
.ea	CS: .ea OK:	Auto.txt will be run

.ec Echo

Determines whether commands are echoed back to the host.

Parameters:

-e on/off	Turn echo on or off
-p	List the current parameter values
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -e, -p

Parameter defaults

The parameter defaults are:

-e off

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.ec -x	CS: .ec -x OK:	.ec defaults loaded
.ec -p	CS: .ec -p PR: -e off -p -x OK:	None

.fd Factory Defaults Command

Restores all command parameters to their default settings.

Parameters:

Only the 2128 uses parameters on this command.

-ep co/cd	ePopLoq mode: Charge Only / Charge and Data
-p	List the current parameter values
-x	Reset all command parameters to defaults

Parameter interpretation order:

The parameters are interpreted and applied in the following order.

-x, -ep, -p

Parameter defaults:

ePopLoq mode is a non volatile setting, with a default of Charge and Data.

-ep cd

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.fd	CS: .fd OK:	Reset complete
.fd -x	CS: .fd -x OK:	Reset complete
.fd -ep co	CS: .fd -ep co OK:	ePop-Loq is now Charge-Only
.fd -p	CS: .fd -p PR: -ep co -p -x OK:	None

.ft FindTag Command

Performs/configures find transponder using the reader. When armed, use the trigger to start/stop finding and double-click to disarm. RP: response is scaled across min/max RSSI seen.

Parameters:

-al on/off	perform an alert (tone or beep) when tag is found
-dt on/off	Include date time response
-ie on/off	Include the EPC response
-ip on/off	Include the transponder RSSI as a percentage of min/max
-l low/med/hig	Volume level
-n	No action, just set the parameters
-o nn	Output power in dBm, where nn is in the range 4 to 30
-p	List the parameter and their current values
-r on/off	Include transponder RSSI response
-sb epc/tid/usr	Bank to use for the select mask
-sd xx..zz	Select mask data in 2 character ASCII Hex pairs padded to ensure full bytes
-sl xx	Length in bits of the select mask, where xx is a 2 character ASCII Hex value
-so xxxx	Number of bits from the start of the block to the start of the select mask, where xxxx is a 4 character ASCII Hex value
-st art/op	Arm (st art) or Disarm (st op) findtag by trigger
-t1 n	n=0..90 Sound percentage threshold 1 (beeps and tone)
-t2 n	n=0..90 Sound percentage threshold 2 (beeps only)
-t3 n	n=0..90 Sound percentage threshold 3 (beeps only)
-to on/off	Variable tone frequency or variable beep speed
-x	Reset the parameters to defaults

Parameter interpretation order:

The parameters are interpreted and applied in the following order.

-x, -al, -ie, -ip, -l, -r, -dt, -sb, -so, -sl, -sd, -o, -t1, -t2, -t3, -to, -p, -st, -n

Parameter defaults:

The parameter defaults are:

-al on, -dt off, -ie on, -ip on, -l hig, -o 30, -r off, -sb epc, -sd, -sl 00, -so 0000, -st op,
-t1 30, -t2 50, -t3 80, -to on

Valid response field headers:

CS: DT: EP: ER: ME: OK: PR: RI: RP:

Examples:

Command	Response	Action
.ft -p -n	CS: .ft -p -n PR: -al on -dt off -ie on -ip on -l hig -n -o 30 -p -r off -sb epc -sd -sl 00 -so 0000 -t1 30 -t2 50 -t3 80 -to on -x OK:	none
.ft -sl 20 -so 0020 -sd 41414242 -n	CS: .ft -sl20 -so0020 -sd41414242 -n OK:	Search parameters set
.ft -start	CS: .ft -start ME: Findtag armed OK:	Reader trigger set for findtag
.ft	CS: .ft ME: No Transponder found ER:005	Transponder not found
.ft	CS: .ft EP: 41414242434344444545464 6 RP: 55 OK:	Transponder found
.ft -stop	CS: .ft -stop ME: Findtag disarmed OK:	Reader trigger set for normal operation
“Trigger double-click in armed mode”	CS: .ft ME: Findtag aborted by user action ER:015	Reader trigger set for normal operation

.hc HID Config Command

Defines settings for HID.

Parameters:

-cd xxx	Sets the delay between characters sent via HID Where xxx is a value between 0 and 999 ms
-kb rr/def	Sets the HID keyboard region (or default) Where rr is the region code and expects a file kbd_rr.hid on the SD card
-p	List the current parameter values
-tm x	Sets the trigger mode, where x is: 0 Single shot, trigger cancels after one operation. 1 Read until, trigger cancels on success or trigger release. 2 While pressed, trigger cancels only on trigger release.
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -cd, -kb, -tm, -p

Parameter defaults

The parameter defaults are:

-cd 0, -kb def, -tm 1

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.hc -x	CS: .hc -x OK:	.sa defaults loaded
.hc -p	CS: .hc -p PR: -cd 0 –p -x OK:	None
.hc –cd 100	CS: .hc –cd 100 OK:	Set the inter-character delay to 100ms

.hd HID Configuration for Double Press Switch Action

Controls how data is presented when *Bluetooth*® is configured for HID by the .bt command.

Parameters:

-bh	xxyy*	Header key codes that preceded a Barcode
-bt	xxyy*	Termination key codes that follow a Barcode
-dh	xxyy*	Header key codes that preceded a transponder data
-dt	xxyy*	Termination key codes that follow a transponder data
-eh	xxyy*	Header key codes that preceded a transponder EPC
-et	xxyy*	Termination key codes that follow a transponder EPC
-ih	xxyy*	Header key codes that preceded an inventory cycle
-it	xxyy*	Termination key codes that follow an inventory cycle
-p		List the current parameter values
-rh	xxyy*	Header key codes that preceded a read cycle
-rt	xxyy*	Termination key codes that follow a read cycle
-td	asc/hex	Determines how transponder data is sent asc - data is assumed to be ASCII text and is sent as is. hex - data is assumed to be raw and is sent as ASCII hex.
-x		Reset the parameters to defaults

*Where xx is the KeyCode for the first key sent and yy is the second. See below for valid KeyCodes.

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -bh, -bt, -dh, -dt, -eh, -et, -ih, -it, -rh, -rt, -td, -p

Parameter defaults

The parameter defaults are:

-bh ffff, -bt 0dff, -dh ffff, -dt 0dff, -eh ffff, -et 0dff, -ih ffff, -it ffff, -rh ffff, -rt ffff, -td hex

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.hd -x	CS: .hd -x OK:	.hd defaults loaded
.hd -p	CS: .hd -p PR: -bh ffff -bt 0dff -dh ffff -dt 0dff -eh ffff -et 0dff -ih ffff -it ffff -rh ffff -rt ffff -td asc OK:	None

Keycode	Key
00	Left control + space
01	Left control + a
02	Left control + b
03	Left control + c
04	Left control + d
05	Left control + e
06	Left control + f
07	Left control + g
08	Backspace
09	Tab
0a	Enter
0b	Left control + k
0c	Left control + l
0d	Enter
0e	Left control + n
0f	Left control + o
10	Left control + p
11	Left control + q
12	Left control + r
13	Left control + s
14	Left control + t
15	Left control + u
16	Left control + v
17	Left control + w
18	Left control + x
19	Left control + y
1a	Left control + z
1b	Left control + space
1c	Esc
20-7e	Corresponding ASCII character
7f	backspace
80	Cursor up
81	Cursor right
82	Cursor down
83	Cursor left
84	Insert
85	Delete
86	Home
87	End
88	Page up
89	Page down
ff	No key pressed

.hs HID Configuration for Single Press Switch Action

Controls how data is presented when Bluetooth® is configured for HID by the .bt command.

Parameters:

-bh	xxyy*	Header key codes that preceded a Barcode
-bt	xxyy*	Termination key codes that follow a Barcode
-dh	xxyy*	Header key codes that preceded a transponder data
-dt	xxyy*	Termination key codes that follow a transponder data
-eh	xxyy*	Header key codes that preceded a transponder EPC
-et	xxyy*	Termination key codes that follow a transponder EPC
-ih	xxyy*	Header key codes that preceded an inventory cycle
-it	xxyy*	Termination key codes that follow an inventory cycle
-p		List the current parameter values
-rh	xxyy*	Header key codes that preceded a read cycle
-rt	xxyy*	Termination key codes that follow a read cycle
-td	asc/hex	Determines how transponder data is sent asc - data is assumed to be ASCII text and is sent as is. hex - data is assumed to be raw and is sent as ASCII hex.
-x		Reset the parameters to defaults

*Where xx is the KeyCode for the first key sent and yy is the second. See above for valid KeyCodes.

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -bh, -bt, -dh, -dt, -eh, -et, -ih, -it, -rh, -rt, -td, -p

Parameter defaults

The parameter defaults are:

-bh ffff, -bt 0dff, -dh ffff, -dt 0dff, -eh ffff, -et 0dff, -ih ffff, -it ffff, -rh ffff, -rt ffff, -td hex

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.hs -x	CS: .hs -x OK:	.hs defaults loaded
.hs -p	CS: .hs -p PR: -bh ffff -bt 0dff -dh ffff -dt 0dff -eh ffff -et 0dff -ih ffff -it ffff -rh ffff -rt ffff -td asc OK:	None

.iv Inventory Command

Performs an inventory of transponders within the read range of the reader.
Returns an error if no transponders are found.

Parameters:

-al on/off	perform an alert after a successful inventory using the current alert parameters from the .al command
-c on/off	Include EPC checksum response
-dr off/on/rnd/clr	Duplicate removal (where supported)
-dt on/off	Include date time response
-e on/off	Include EPC PC information response
-fi on/off	Impinj fast ID extension. If set, Transponders which support this feature will include their TID in the response
-fs on/off	filter out all but the strongest RSSI response
-ic on/off	Include the phase response
-ip on/off	Include the channel frequency response
-ie on/off	Include the EPC response
-io on/off	Inventory only, if set to on then no select will be performed before the inventory round is started
-ix on/off	Index number each transponder response
-n	No action, just set the parameters
-o nn	Output power in dBm, where nn is in the range 10 to 29
-p	List the parameter and their current values
-qa fix/dyn	Q algorithm
-ql all/nsl/sl	query Select
-qs s0/s1/s2/s3	query Session
-qt a/b	query Target
-qv nn	Q value for fixed Q operations (0..15)
-r on/off	Include transponder RSSI response
-sa n	Select action

Parameter n=	Matching Action		Non Matching Action	
	SL Flag	Session Flag	SL Flag	Session Flag
0	assert	Set A	deassert	Set B
1	assert	Set A	nothing	nothing
2	nothing	nothing	deassert	Set B
3	toggle	toggle	nothing	nothing
4	deassert	Set B	assert	Set A
5	deassert	Set B	nothing	nothing
6	nothing	nothing	assert	Set A
7	nothing	nothing	toggle	toggle

-sb epc/tid/usr	Bank to use for the select mask
-sd xx..zz	Select mask data in 2 character ASCII Hex pairs padded to ensure full bytes
-sl xx	Length in bits of the select mask, where xx is a 2 character ASCII Hex value
-so xxxx	Number of bits from the start of the block to the start of the select mask, where xxxx is a 4 character ASCII Hex value
-st s0,s1,s2,s3,sl	Select target
-tf on/off	Impinj tag focus extension. Only effective if qs=s1, qt=a and if supported by the transponder.
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -al, -c, -e, -r, -ic, -ip, -ie, -dr, -dt, -fs, -ix, -sb,-so, -sl, -sd, -o, -io, -sa, -st, -qa, -ql, -qs, -qt, -qv, -fi, -tf, -p, -n

Parameter defaults

The parameter defaults are:

-al on, -c off, -dr off, -dt off, -e off, -fi off, -fs off, -ic off, -ip off, -ie on, -io on, -ix off, -o 29, -qa dyn, -ql all, -qs s1, -qt a, -qv 4, -r off, -sa 0, -sb epc, -sd, -sl 00, -so 0000, -st s1, -tf off

Valid response field headers:

CF: CR: CS: DT: EP: ER: IX: ME: OK: PC: PH: PR: RI: TD:

Examples:

Command	Response	Action
.iv -p -n	CS: .iv -p -n PR: -al on -c off -dt off -e off -fi off –fs off -ic off -ip off -ie on -io on -ix off -n -o 29 -p -qa dyn -ql all -qs s1 -qt a -qv 4 -r off -sa 0 -sb epc -sd -sl 00 -so 0000 -st s1 -tf off -x OK:	none
.iv	CS: .iv EP: 310833B2DDD906C000001234 EP: 341486E37C00000000004255 EP: 341486E37C00000000004254 OK:	3 transponders read
.iv -dt on -e on	CS: .iv -dt on -e on DT: 2019-01-26T19:00:52 EP: 341486E37C00000000004254 PC: 3000 EP: 341486E37C00000000004255 PC: 3000 EP: 310833B2DDD906C000001234 PC: 3000 OK:	3 transponders read

.ki Kill Command

This command is used to kill transponders. The selected transponders with matching access and kill passwords will be permanently killed.

Parameters:

-ap xxxxxxxx	Access password, where xxxxxxxx is an 8 character ASCII Hex value
-c on/off	Include EPC checksum response
-dt on/off	Include date time response
-e on/off	Include EPC PC information response
-io on/off	Inventory only, if set to on then no select will be performed before the inventory round phase is started
-ix on/off	Index number each transponder response
-kp xxxxxxxx	Kill password, where xxxxxxxx is an 8 character ASCII Hex value
-n	No action, just set the parameters
-o nn	Output power in dBm, where nn is in the range 10 to 29
-p	List the parameter and their current values
-ql all/nsl/sl	query Select
-qs s0,s1,s2,s3	query Session
-qt a/b	query Target
-qv nn	Q value (0..15)
-r on/off	Include transponder RSSI response
-sa n	Select action

Parameter n=	Matching Action		Non Matching Action	
	SL Flag	Session Flag	SL Flag	Session Flag
0	assert	Set A	deassert	Set B
1	assert	Set A	nothing	nothing
2	nothing	nothing	deassert	Set B
3	toggle	toggle	nothing	nothing
4	deassert	Set B	assert	Set A
5	deassert	Set B	nothing	nothing
6	nothing	nothing	assert	Set A
7	nothing	nothing	toggle	toggle

-sb epc/tid/usr	Bank to use for the select mask
-sd xx..zz	Select mask data in 2 character ASCII Hex bytes padded to ensure full bytes, up to a maximum of 32 bytes.
-sl xx	Length in bits of the select mask, where xx is a 2 character ASCII Hex value
-so xxxx	Number of bits from the start of the block to the start of the select mask, where xxxx is a 4 character ASCII Hex value
-st s0,s1,s2,s3,sl	Select target
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -c, -e, -r, -dt, -ix, -sb,-so, -sl, -sd, -o, -io,-sa, -st, -ql, -qs, -qt, -qv, -ap, -kp, -p, -n

Parameter defaults

The parameter defaults are:

-ap 00000000, -c off, -dt off, -e off, -io off, -ix off, -kp 00000000, -o 29, -ql all, -qs s1,

-qt b, -qv 2, -r off, -sa 4, -sb epc, -sd, -sl 00, -so 0000, -st s1

Valid response field headers:

CR: CS: DT: EA: EB: EP: ER: IX: KS: ME: OK: PC: PR: RI:

Examples:

Command	Response	Action
.ki -p -n	CS: .ki -p -n PR: -ap 00000000 -c off -dt off -e off -io off -ix off -kp 00000000 -n -o 29 -p -ql all -qs s1 -qt b -qv 2 -r off -sa 4 -sb epc -sd 3005FB63AC1F3681EC880468 -sl 60 -so 0020 -st s1 -x OK:	No Action
.ki -ap 00000001 -kp 00000001	CS: .ki -ap 00000001 -kp 00000001 EP: 3005FB63AC1F3841EC880467 KS: Kill Success OK:	Transponder is killed

.lk Licence Key

This command reads, writes and deletes the Licence Key stored in the reader's non-volatile memory. The Licence Key can be up to 255 characters long and can contain any printable characters with the exception of double quotes (").
How the licence key function is used is up to the programmer, it could be used to store a simple password or some form of hashing could be used with the two unique strings, the serial number and *Bluetooth*® address, returned from the .vr command.

Parameters:

-d yes	Delete the Licence Key
-p	List the parameters
-s "Licence Key"	Set the licence key, up to 255 characters, enclosed in double quotes(").The licence key can contain any printable character except for double quotes ("). The Licence key can only be written if it is currently blank.

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-d, -s, -p

Valid response field headers:

CS: ER: LK: ME: OK: PR:

Examples:

Command	Response	Action
.lk -p	CS: .lk -p PR: -d -p -s LK: ThisIsMyLicenceKey OK:	Licence key and parameters read
.lk -d yes -s "NewLicence"	CS:.lk -d yes -s "NewLicence" LK: NewLicence OK:	New licence key written

.lo Lock Command

This command is used to control access to the memory banks and passwords of the selected transponders. The lock is controlled by a 20 bit lock payload, please refer to the latest UHF Class 1 Gen 2 Standard for details. Care should be taken since some lock actions are permanent.

Parameters:

-ap xxxxxxxx	Access password, where xxxxxxxx is an 8 character ASCII Hex value
-c on/off	Include EPC checksum response
-dt on/off	Include date time response
-e on/off	Include EPC PC information response
-io on/off	Inventory only, if set to on then no select will be performed before the inventory round phase is started
-ix on/off	Index number each transponder response
-lp xxxxx	20 bit Lock command payload where xxxxx is a 5 character ASCII Hex value
-n	No action, just set the parameters
-o nn	Output power in dBm, where nn is in the range 10 to 29
-p	List the parameter and their current values
-ql all/nsl/sl	query Select
-qs s0,s1,s2,s3	query Session
-qt a/b	query Target
-qv nn	Q value (0..15)
-r on/off	Include transponder RSSI response
-sa n	Select action

Parameter n=	Matching Action		Non Matching Action	
	SL Flag	Session Flag	SL Flag	Session Flag
0	assert	Set A	deassert	Set B
1	assert	Set A	nothing	nothing
2	nothing	nothing	deassert	Set B
3	toggle	toggle	nothing	nothing
4	deassert	Set B	assert	Set A
5	deassert	Set B	nothing	nothing
6	nothing	nothing	assert	Set A
7	nothing	nothing	toggle	toggle

-sb epc/tid/usr	Bank to use for the select mask
-sd xx..zz	Select mask data in 2 character ASCII Hex bytes padded to ensure full bytes, up to a maximum of 32 bytes.
-sl xx	Length in bits of the select mask, where xx is a 2 character ASCII Hex value
-so xxxx	Number of bits from the start of the block to the start of the select mask, where xxxx is a 4 character ASCII Hex value
-st s0,s1,s2,s3,sl	Select target
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -c, -e, -r, -dt, -ix, -sb,-so, -sl, -sd, -o, -io,-sa, -st, -ql, -qs, -qt, -qv, -lp, -ap, -p, -n

Parameter defaults

The parameter defaults are:

-ap 00000000, -c off, -dt off, -e off, -io off, -ix off, -lp 00000, -o 29, -ql all, -qs s1,

-qt b, -qv 2, -r off, -sa 4, -sb epc, -sd, -sl 00, -so 0000, -st s1

Valid response field headers:

CR: CS: DT: EA: EB: EP: ER: IX: LS: ME: OK: PC: PR: RI:

Examples:

Command	Response	Action
.lo -n -p	CS: .lo -n -p PR: -ap 00000000 -c off -dt off -e off -io off -ix off -lp 00000 -n -o 29 -p -ql all -qs s1 -qt b -qv 2 -r off -sa 4 -sb epc -sd -sl 00 -so 0000 -st s1 -x OK:	No Action
.lo -lp 08020 -ap 00000001	CS: .lo -lp 08020 -ap 00000001 EP: 3005FB63AC1F3681EC880468 LS: Lock Success OK:	EPC memory bank lock is set so it is writable only in the secured state

.mt Mount/Dismount Internal Memory

Mounts or Dismounts the internal memory, when connected via USB, on readers that support internal memory.

Parameters:

-d	Dismount the internal storage
-m	Mount the internal storage
-p	List the parameters

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-d, -m, -p

Parameter defaults

No parameter defaults are required:

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.mt -p	CS: .mt -p PR: -d -m -p OK:	No Action
.mt -m	CS: .mt -m ME: Mounting internal memory OK:	The internal memory was mounted

.pd Push Switch Double Press

Starts a timed software switch double press, this is equivalent to a double press and hold of the hardware switch. If the switch is already in use an error will be returned. If the duration is set to zero the switch press will continue until stopped with an abort command. If the switch action is set to barcode then the switch press will end on completion of the barcode read.

Parameters:

-n		No action, just set the parameters
-p		List the current parameter values
-t n	n=0..99	Press duration in seconds
-x		Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -t, -p, -n

Parameter defaults

The parameter defaults are:

-t 5

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.pd -p -n	CS: .pd -p -n PR: -n -p -t 5 -x OK:	No Action
.pd	CS: .pd ME: Switch already in use ER:014	The switch press was refused because the switch was already in use

.ps Push Switch Single Press

Starts a timed software switch single press, this is equivalent to a single press and hold of the hardware switch. If the switch is already in use an error will be returned. If the duration is set to zero the switch press will continue until stopped with an abort command. If the switch action is set to barcode then the switch press will end on completion of the barcode read.

Parameters:

-n		No action, just set the parameters
-p		List the current parameter values
-t n	n=0..99	Press duration in seconds
-x		Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -t, -p, -n

Parameter defaults

The parameter defaults are:

-t 5

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.ps -p -n	CS: .ps -p -n PR: -n -p -t 5 -x OK:	No Action
.ps	CS: .ps ME: Switch already in use ER:014	The switch press was refused because the switch was already in use

.ra Read the Autorun File (Deprecated)

Reads the Autorun file, additionally the Autorun file can be deleted. This command cannot be used in the
Autorun file.

Parameters:

-d yes delete the Autorun file

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-d

Parameter defaults

No parameter defaults are required:

Valid response field headers:

CS: ER: AB: AE: ME: OK:
Potentially any other response field could be contained in the log file.

Examples:

Command	Response	Action
.ra	CS: .ra AB: *Autorun* file data AE: OK:	The autorun file is read
.ra -d yes	CS: .ra -d yes OK:	The autorun file is deleted

.rd Read Transponder Command

Performs an inventory of transponders within the read range of the reader and then reads the data from the requested bank. Returns an error if no transponders are found.

Parameters:

-al on/off	perform an alert after a successful read using the current alert parameters from the .al command
-ap xxxxxxxx	Access password, where xxxxxxxx is an 8 character ASCII Hex value
-c on/off	Include EPC checksum response
-db epc/tid/usr/res	Data bank to read from
-dl xx	Data length, size of the data to read (number of 16 bit words in the range 1 to 253 decimal i.e. 01 to FD hex), where xx is a 2 character ASCII Hex value
-do xxxx	Data offset, the number of 16 bit words, from the start of the block, to start read from, where xxxx is a 4 character ASCII Hex value
-dt on/off	Include date time response
-e on/off	Include EPC PC information response
-fs on/off	filter out all but the strongest RSSI response
-ie on/off	Include the EPC response
-ic on/off	Include the phase response
-ip on/off	Include the channel frequency response
-io on/off	Inventory only, if set to on then no select will be performed before the inventory round phase is started
-ix on/off	Index number each transponder response
-n	No action, just set the parameters
-o nn	Output power in dBm, where nn is in the range 10 to 29
-p	List the parameter and their current values
-ql all/nsl/sl	query Select
-qm n	QT mode n = 0 Standard read n = 1 Read from private memory n = 2 Read from private memory short range n = 3 Read the QT control word
-qs s0,s1,s2,s3	query Session
-qt a/b	query Target
-qv nn	Q value (0..15)
-r on/off	Include transponder RSSI response
-sa n	Select action

Parameter n=	Matching Action		Non Matching Action	
	SL Flag	Session Flag	SL Flag	Session Flag
0	assert	Set A	deassert	Set B
1	assert	Set A	nothing	nothing
2	nothing	nothing	deassert	Set B
3	toggle	toggle	nothing	nothing
4	deassert	Set B	assert	Set A
5	deassert	Set B	nothing	nothing
6	nothing	nothing	assert	Set A
7	nothing	nothing	toggle	toggle

-sb epc/tid/usr	Bank to use for the select mask
-sd xx..zz	Select mask data in 2 character ASCII Hex bytes padded to ensure full bytes, up to a maximum of 32 bytes.
-sl xx	Length in bits of the select mask, where xx is a 2 character ASCII Hex value
-so xxxx	Number of bits from the start of the block to the start of the select mask, where xxxx is a 4 character ASCII Hex value
-st s0,s1,s2,s3,sl	Select target
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -al, -c, -e, -r, -ie, -ic, -ip, -dt, -fs, -ix, -sb ,-so, -sl, -sd, -o, -io, -qm, -sa, -st, -ql, -qs, -qt, -qv, -db, -do, -ap, -dl, -p, -n

Parameter defaults

The parameter defaults are:

-al on, -ap 00000000, -c off, -db epc, -dl 02, -do 0000, -dt off, -e off, -fs off, -ic off, -ip off, -ie on, -io off, -ix off, -o 29, -ql all, -qm 0, -qs s2, -qt b, -qv 4, -r off, -sa 4, -sb epc, -sd, -sl 00, -so 0000, -st s2

Valid response field headers:

CF: CR: CS: DT: EA: EB: EP: ER: IX: ME: OK: PC: PH: PR: QT: RD: RI:

Examples:

Command	Response	Action
.rd -p -n	CS: .rd -p -n PR: -al on -ap 00000000 -c off -db epc -dl 02 -do 0000 -dt off -e off –fs off ie on -io off -ix off -n -o 29 -p -ql all –qm 0 -qs s2 -qt b -qv 6 -r off -sa 4 -sb epc -sd -sl 00 -so 0000 -st s2 -x OK:	none
.rd	CS: .rd EP: 310833B2DDD906C000001234 RD: C3993000 EP: 341486E37C00000000004254 RD: 70CF3000 OK:	2 transponders read
.rd -dt on -e on	CS: .rd -dt on -e on DT: 2019-01-26T19:00:52 EP: 341486E37C00000000004254 PC: 3000 RD: 70CF3000 EP: 310833B2DDD906C000001234 PC: 3000 RD: C3993000 OK:	2 transponders read

.rl Read the Log File

Reads log file, additionally the log file can be deleted or logging can be turned on or off. If the delete option is used the log file is erased and then a new log file is created. This command can only be used in the Autorun file with the –c off option.
Logging can be completely disabled by adding an empty file called “no.log” to the root of the SD card.

Parameters:

-b xxxxxx	Read a 512 byte block from the log where xxxxxxxx is an 6 character ASCII hex value representing the block offset from the start of the log file.
-c on/off	turn command logging on or off
-d yes	delete the log file
-l	Read the log file length. Returns a LL response with the log file length in bytes
-n	No action, just set the parameters
-p	List the parameter and their current values
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -d, -c, -l, -p, -n, -b

Parameter defaults

-c on

Valid response field headers:

CS: ER: LB: LE: LL: ME: OK: PR:

Potentially any other response field could be contained in the log file.

Examples:

Command	Response	Action
.rl	CS: .rl LB: *Log* file data LE: OK:	The log file is read
.rl -d yes	CS: .rl -d yes LB: **** Beginning of Log **** DT: 2019-01-14T20:17:24 EV: Log File created LE: **** End of Log **** OK:	The log file is deleted

.sa Switch Action Command

Defines what happens when the switch is pressed.

Parameters:

-a on/off	Turn asynchronous switch status reporting on or off
-d off/rd/wr/inv/bar/usr/ad	Set the double press switch action
-h on/off	Turn haptic feedback on or off
-p	List the current parameter values
-rd xxx	Sets the delay before the switch double press action is repeated when the switch is held pressed. Where xxx is a value between 1 and 999 ms
-rs xxx	Sets the delay before the switch single press action is repeated when the switch is held pressed. Where xxx is a value between 1 and 999 ms
-s off/rd/wr/inv/bar/usr/ad	Set the single press switch action
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -rd, -rs, -a, -d, -s, -h, -p

Parameter defaults

The parameter defaults are:

-a off, -d ad, -h off, -rd 100, -rs 100, -s ad

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.sa -x	CS: .sa -x OK:	.sa defaults loaded
.sa -p	CS: .sa -p PR: -a off -d da -h off -p -rd 100 -rs 100 -s ad -x OK:	None

.sh Serial HID Command

Configures the reader to send HID style responses over an SPP link.
The reader will continue to process all ASCII2 commands, but only those with HID output reply.
Prefix and suffix values may be set using .hs & .hd

Parameters:

-bt on/off	Turn HID responses over Bluetooth SPP on or off
-us on/off	Turn HID responses over USB SPP on or off
-p	List the current parameter values
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -bt, -us, -p

Parameter defaults

The parameter defaults are:

-bt off, -us off

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.sh -x	CS: .sa -x OK:	.sh defaults loaded
.sh -bt on -p	CS: .sa -bt on -p PR: -bt on -us off -p -x OK:	Enables HID responses over Bluetooth

.sl Sleep

This command puts the unit into sleep mode. This will disconnect any active *Bluetooth*® connections. If auto-reconnect (ar) is on, when woken-up, the unit will attempt to reconnect to the previously connected device or if connect mode (cm) is off, remember the next device.

Parameters:

-ar on/off	turn bluetooth auto reconnect, on wake up, on or off
-cm off/rfc/iap	reconnection mode (only off and iap currently supported)
-ma xx:xx:xx:xx:xx:xx	Set the Bluetooth® mac address to reconnect to
-rb yes	Cold reboot (2128/2166/2173)
-n	No action, just set the parameters
-p	List the parameters and their current values
-x	Reset the parameters to defaults

Parameter interpretation order:

-x, -ar, -cm, -ma, -rb, -p, -n

Parameter defaults:

-ar off, -cm off, -ma

Valid response field headers:

CS: ER: ME: PR: OK:

Examples:

Command	Response	Action
.sl	CS: .sl OK:	Unit goes to sleep
.sl -x -p	CS: .sl -x -p PR: -ar off -cm off -ma -n -p -x OK:	.sl defaults loaded and reported. Unit goes to sleep
.sl -n -p	CS: .sl -n -p PR: -ar on -cm iap -ma 00:07:80:41:a4:c6 -n -p -x OK:	Current values are reported. Unit stays awake
.sl -ar on -cm off	CS: .sl -ar on -cm off OK:	Unit goes to sleep No reconnect on wakeup, but will remember next connection
.sl -ar off -cm off	CS: .sl -ar off -cm off OK:	Unit goes to sleep No reconnect on wakeup, nor will it remember future connections

.sp User Defined Switch Single Press Action

Reads or sets the single press user action used when ".sa -s usr" is configured.

Parameters:

-s user action command Set the user action

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-s

Parameter defaults

No parameter defaults are required:

Valid response field headers:

CS: ER: ME: OK: SP:

Examples:

Command	Response	Action
.sp	CS: .sp SP: .iv OK: <CRLF	User action is read
.sp -s .bc -t 4	CS: .sp -s .bc -t 4 SP: .bc -t 4 OK:	User action is set

.sr Show Region

If supported by the reader, this command reads RF operating region and the permitted output power range.

Parameters:

-ma nn	Maximum output power for the region in dBm. Read Only
-mi nn	Minimum output power for the region in dBm. Read Only
-p	List the parameters and their current values
-rp password	Factory use only. Regulatory region password
-s identifier	Factory use only. Regulatory region identifier

Acceptable region codes are dependent on the version of reader but could include:
eu, eua, in, ina, us, hk, tw, kr, my, cn, za, br, th, sg, au, uy, vn, il, ph, id, nz, jp, pe, ru

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-rp, -s, -p, -mi, -ma

Parameter defaults

-ma 29, -mi 10, -rp, -s

Valid response field headers:

CS: ER: ME: OK: SP:

Examples:

Command	Response	Action
.sr	CS: .sr SR: us OK:	Region is United States
.sr -s eu	CS: .sr -s eu -rp <password> SR: eu OK:	Set region to Europe

.ss Switch State Command

Reads the state of the switch

Parameters:

No parameters are used for this command.

Valid response field headers:

CS: SW: ER: ME: OK:

Examples:

Command	Response	Action
.ss	CS: .ss SW: single OK:	The state of the switch is read and it was on by a single click
.ss	CS: .ss SW: off OK:	The state of the switch is read and it was off

.st Sleep Timeout

Sets the timeout before the reader sleeps if there are no connections to the reader or if no trigger presses occur in HID mode.

Parameters:

-p		List the current parameter values
-h n	n=1..999	Sleep duration in seconds for HID
-t n	n=15..999	Sleep duration in seconds for no connection
-x		Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -h, -t, -p

Parameter defaults

The parameter defaults are:

-h 60, -t 60

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.st -p	CS: .st -p PR: -p -h60 -t60 -x OK:	No Action
.st -t 15	CS: .st -t 15 OK:	The no connection sleep timeout is set to 15 Seconds

.tm Time Command

Reads or sets the time.

Parameters:

-s hhmmss Set the time

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-s

Parameter defaults

No parameter defaults are required:

Valid response field headers:

CS: ER: ME: OK: TM:

Examples:

Command	Response	Action
.tm	CS: .tm TM: 18:24:02 OK:	The time is read
.tm -s 203100	CS: .tm -s 203100 TM: 20:31:00 OK:	The time is set

.ts Transponder Select

This command is used to set the state of transponders. It pushes matching and non- matching transponders in to the state determined by the -sa parameter. This command can only be used with persistent target sessions as the carrier will be turned off after the command.

Parameters:

-n No action, just set the parameters
-o nn Output power in dBm, where nn is in the range 10 to 29
-p List the parameter and their current values
-sa n Select action

Parameter n=	Matching Action		Non Matching Action	
	SL Flag	Session Flag	SL Flag	Session Flag
0	assert	Set A	deassert	Set B
1	assert	Set A	nothing	nothing
2	nothing	nothing	deassert	Set B
3	toggle	toggle	nothing	nothing
4	deassert	Set B	assert	Set A
5	deassert	Set B	nothing	nothing
6	nothing	nothing	assert	Set A
7	nothing	nothing	toggle	toggle

-sb epc/tid/usr Bank to use for the select mask
-sd xx..zz Select mask data in 2 character ASCII Hex bytes padded to ensure full bytes, up to a maximum of 32 bytes.
-sl xx Length in bits of the select mask, where xx is a 2 character ASCII Hex value
-so xxxx Number of bits from the start of the block to the start of the select mask, where xxxx is a 4 character ASCII Hex value
-st s1,s2,s3,sl Select target
-x Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order:

-x, -sb, -so, -sl, -sd, -o, -sa, -st, -p, -n

Parameter defaults

The parameter defaults are:

-o 29, -sa 4, -sb epc, -sd, -sl 00, -so 0000, -st s1

Valid response field headers:

CS: ER: ME: OK: PR:

Examples:

Command	Response	Action
.ts -p -n	CS: .ts -p -n PR: -n -o 29 -p -sa 4 -sb epc -sd -sl 00 -so 0000 -st s1 -x OK:	none

.vr Version Information Command

Reads the version information from the reader

Parameters:

No parameters are used for this command.

Valid response field headers:

CS: AS: BA: BV: HB: HF: HS: IA: MF: PV: RB: RF: RS: UB: UF: US: ER: ME: OK:

Examples:

Command	Response	Action
.vr	CS: .vr MF: TSL UK Ltd. US: 2128-000001 UF: 1.3.3 UB: 1.0.6 PV: 2.5.0 RS: 00000012-46464306-20303333 RF: 1.6.8.3 RB: 1.6.8.3 IA: 1.6.8.240 AS: 1128-S1-US-002911 BA: 88:6B:0F:31:90:03 BV: 1.0.6 OK:	The version information was read

.wa Write Command to Autorun file (Deprecated)

Writes the following command to the end of the Autorun file. This command cannot be used in the Autorun file.

Parameters:

No parameters are used for this command.

Valid response field headers:

CS: ER: ME: OK:

Examples:

Command	Response	Action
.wa .al -voff -n	CS: .wa .al -voff - n OK:	The ".al -voff -n" command is appended to the the end of the Autorun file, this command is turning off the vibrate at wake up.

.wr Write Transponder Command

This command tries to write data to any transponder that meets the select criteria. It will return an error if no transponder is found.
For each transponder the number of words written follows the WW: response header.

Parameters:

-al on/off — Perform an alert after a successful write using the current alert Parameters from the .al command
-ap xxxxxxxx — Access password, where xxxxxxxx is an 8 character ASCII Hex value
-c on/off — Include EPC checksum response
-da xxxx..zzzz — The data to write in 4 character ASCII Hex words. Up to a maximum of 32 words
-db epc/tid/usr/res — Data bank to write to
-dl xx — Length in words of the data to write, where xx is a 2 character ASCII Hex value up to a maximum of 20hex
-do xxxx — Data bank offset, this is the offset, in 16 bit words, from the start of the block to where the data will be written, where xxxx is a 4 character ASCII Hex value
-dt on/off — Include date time response
-e on/off — Include EPC PC information response
-io on/off — Inventory only, if set to on then no select will be performed before the inventory round phase is started
-ix on/off — Index number each transponder response
-n — No action, just set the parameters
-o nn — Output power in dBm, where nn is in the range 10 to 29
-p — List the parameter and their current values
-ql all/nsl/sl — query Select
-qm n — QT mode
n = 0 Standard write
n = 1 Write to private memory
n = 2 Write to private memory short range
n = 3 Write the QT control word with data –da xxxx

-qs s0,s1,s2,s3 — query Session
-qt a/b — query Target
-qv nn — Q value (0..15)
-r on/off — Include transponder RSSI response
-sa n — Select action

Parameter n=	Matching Action		Non Matching Action	
	SL Flag	Session Flag	SL Flag	Session Flag
0	assert	Set A	deassert	Set B
1	assert	Set A	nothing	nothing
2	nothing	nothing	deassert	Set B
3	toggle	toggle	nothing	nothing
4	deassert	Set B	assert	Set A
5	deassert	Set B	nothing	nothing
6	nothing	nothing	assert	Set A
7	nothing	nothing	toggle	toggle

-sb epc/tid/usr — Bank to use for the select mask
-sd xx..zz — Select mask data in 2 character ASCII Hex bytes padded to ensure full bytes, up to a maximum of 32 bytes.
-sl xx — Length in bits of the select mask, where xx is a 2 character ASCII Hex value
-so xxxx — Number of bits from the start of the block to the start of the select mask, where

	xxxx is a 4 character ASCII Hex value
-st s0,s1,s2,s3,sl	Select target
-wm s/b	Set the Write Mode to either single or block. Block mode is not supported by all transponders
-wx a/1/2	Impinj Block Write Mode extension. Auto, Force 1 or Force 2 block write. Unless the transponder population is known, use Auto. This option is only valid if -wm=b
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -al, -c, -e, -r, -dt, -qm, -ix, -sb,-so, -sl, -sd, -o, -io, -sa, -st, -ql, -qs, -qt, -qv, -dl, -da, -db, -do, -ap, -wm, -wx, -p, -n

Parameter defaults

The parameter defaults are:

-al on, -ap 00000000, -c off, -da, -db usr, -dl 00, -do 0000, -dt off, -e off, -io off, -ix off, -o 29, -ql all, -qm 0, -qs s2, -qt b, -qv 4, -r off, -sa 4, -sb epc, -sd, -sl 00, -so 0000, -st s2, -wm s, -wx a

Valid response field headers:

CR: CS: DT: EA: EB: EP: ER: IX: ME: OK: PC: PR: RI: WW:

Examples:

Command	Response	Action
.wr -p -n	CS: .wr-p-n PR: -al on -ap 00000000 -c off -da -db usr -dl 00 -do 0000 -dt off -e off -io off -ix off -n -o 29 -p -ql all –qm 0 -qs s2 -qt b -qv 4 -r off -sa 4 -sb epc -sd -sl 00 -so 0000 -st s2 -wm s -wx a -x OK:	none
.wr -da1234 -dl01	CS: .wr -da1234 -dl01 EP: 310833B2DDD906C000001234 WW: 1 EP: 310833B2DDD906C000001235 WW: 0 EP: 310833B2DDD906C000001236 WW: 1 OK:	Write 0x1234 to a transponders

.ws Write Single Transponder Command

This command writes data to a single transponder. It uses a single time slot so there must be enough mask information to select a single transponder.
Returns an error if no transponder is found or if the write is incomplete.

Parameters:

-al on/off	Perform an alert after a successful write using the current alert Parameters from the .al command
-ap xxxxxxxx	Access password, where xxxxxxxx is an 8 character ASCII Hex value
-c on/off	Include EPC checksum response
-da xxxx..zzzz	The data to write in 4 character ASCII Hex words. Up to a maximum of 32 words
-db epc/tid/usr /res	Data bank to write to
-dl xx	Length in words of the data to write, where xx is a 2 character ASCII Hex value up to a maximum of 20hex
-do xxxx	Data bank offset, this is the offset, in 16 bit words, from the start of the block to where the data will be written, where xxxx is a 4 character ASCII Hex value
-dt on/off	Include date time response
-e on/off	Include EPC PC information response
-n	No action, just set the parameters
-o nn	Output power in dBm, where nn is in the range 10 to 29
-p	List the parameter and their current values
-r on/off	Include transponder RSSI response
-sb epc/tid/usr	Bank to use for the select mask
-sd xx..zz	Select mask data in 2 character ASCII Hex bytes padded to ensure full bytes, up to a maximum of 32 bytes.
-sl xx	Length in bits of the select mask, where xx is a 2 character ASCII Hex value
-so xxxx	Number of bits from the start of the block to the start of the select mask, where xxxx is a 4 character ASCII Hex value
-x	Reset the parameters to defaults

Parameter interpretation order

The parameters are interpreted and applied in the following order.

-x, -al, -c, -e, -r, -dt, -sb,-so, -sl, -sd, -o, -dl, -da, -db, -do, -ap, -p, -n

Parameter defaults

The parameter defaults are:

-al on, -ap 00000000, -c off, -da, -db usr, -dl 00, -do 0000, -dt off, -e off, -o 29,

-r off, -sb epc, -sd, -sl 00, -so 0000

Valid response field headers:

CR: CS: DT: EP: ER: ME: OK: PC: PR: RI: WW:

Examples:

Command	Response	Action
.ws -p -n	CS: .ws-p-n PR: -al on -ap 00000000 -c off -da -db usr -dl 00 -do 0000 -dt off -e off -n -o 29 -p -r off -sb epc -sd -sl 00 -so 0000 -x OK:	none
.ws -da1234 -dl01	CS: .ws -da1234 -dl01 EP: 310833B2DDD906C000001234 WW: 1 OK:	Write 0x1234 to a transponder

HARDWARE SPECIFIC CONNECTION NOTES

For specific information about how to communicate with a particular Technology Solutions UHF reader using the ASCII Protocol please refer to the User Guide for that product. User guides are available for download from the Product Download pages (free registration required):

- 2128 *Bluetooth*® UHF RFID Reader
- IH21 *Bluetooth*® UHF RFID Reader
- 1166 Rugged *Bluetooth*® UHF RFID Reader
- 1153 *Bluetooth*® Wearable UHF RFID Reader
- 1128 *Bluetooth*® UHF RFID Reader

The core of the ASCII protocol is based on reading and writing serial data over a serial connection. Typically this connection is 115200 baud, 8 data bits, 1 stop bit and no parity with CTS/RTS (hardware) handshaking. Although some products use a standard serial port those that communicate over USB and *Bluetooth*® use a virtual serial port.

When communicating via *Bluetooth*® you can either use a *Bluetooth*® virtual serial port and have your application open a com port using serial APIs or alternatively you can usually open a *Bluetooth*® stream using the Serial Port Profile service identifier without having to use a serial port layer. Refer to the samples provided with the SDKs or contact support@tsl.com for more information.

ABOUT TSL®

About

TECHNOLOGY SOLUTIONS UK LTD

TSL® | Global Leaders in Mobile RFID

Technology Solutions UK Ltd (TSL®) is a leading manufacturer of high performance mobile RFID readers used to identify and track products, assets, data or personnel.
For over two decades, TSL® has delivered innovative data capture solutions to Fortune 500 companies around the world using a global network of distributors and system integrators. Specialist in-house teams design all aspects of the finished products and software ecosystems, including electronics, firmware, application development tools, RF design and injection mould tooling.
TSL® is an ISO 9001:2015 certified company.

ISO 9001: 2015

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