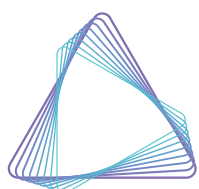
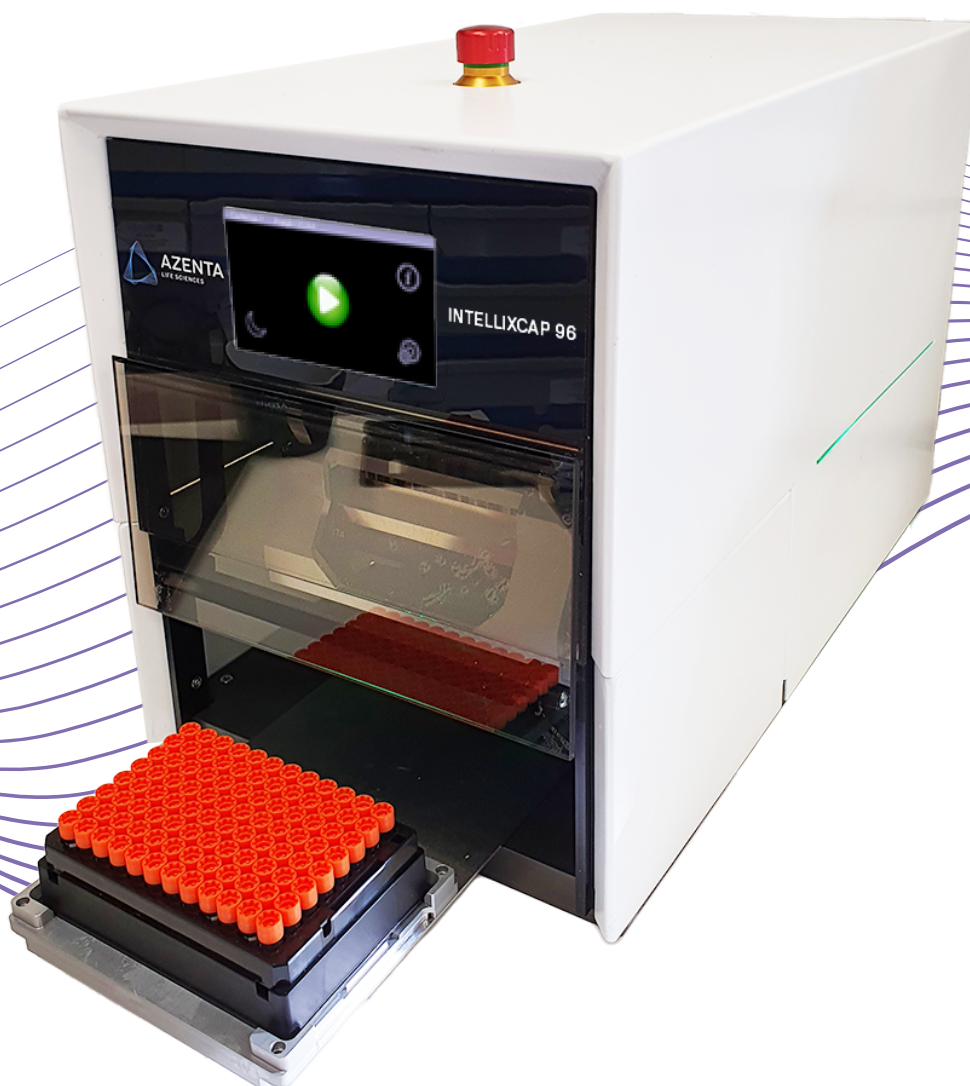


IntelliXcap Automated Screw Cap Decapper Re-Capper

RS232 Command List



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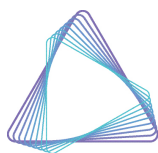
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These are the original instructions for the IntelliXcap Automated Screw Cap Decapper Re-Capper.



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IntelliXcap Automated Screw Cap Decapper Re-Capper RS232 Commands List

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1. Introduction

Entering IntelliXcap Mode

In order to operate the IntelliXcap in IntelliXcap mode, set setpoint 86 to "2".

COM Settings

RS232	
Baud rate	9600
Data bit	8
Parity	none
Stop Bit	1
Handshake	OFF

Command Structure

The IntelliXcap mode is overall structured as a 3-step response. All responses start and end with ASCII control characters char2 (Text Start) and char3 (Text End).

The first step is confirming the command is received with char6 (ACK). The second step is confirming the start of the operation by returning the command followed by "OK" (e.g. ZOK). The third step is to report success (ZDONE) or failure (HomeERROR).

The IntelliXcap evaluates your inputs and disregards unfeasible commands with a "CommandIgnore".

NOTE: <NAME> indicates the ASCII control character: char2 is <STX>, char6 is <ACK>, char3 is <ETX>.

Power up Sequence

The IntelliXcap will choose between two sequences at startup based on whether a cartridge is installed. If a cartridge is installed and detected, it will run an Initialize command (Z) and report operation response (ZDONE or HomeERROR). If no cartridge is detected, it will run a cartridge eject sequence (C) with operation responses (CartridgeEjectERROR or CartridgeEjectDONE).

Caps on Pins

The IntelliXcap knows if the machine has caps loaded. To avoid dropping caps inside the machine, it will enter recovery mode, where the user should select the Attempt Recap option.

NOTE: The Extended Status command can be used to verify whether caps are on pins.

Additional Notes

- a. Starting a decap is only possible if system does not have caps on pins. Response will be hOK -> CommandIgnore.
- b. Starting a recap is only possible if system has caps on pins. Outside scope the response is iOK -> CommandIgnore.
- c. Starting a waste/store is only possible if system has caps on pins. The store sequence is automatically selected based on height of the capcarrier, otherwise recap sequence is performed. Outside scope the response is: bOK -> CommandIgnore.
- d. Initiating the Standby command is only possible with no caps on pins. Otherwise, response will be jOK -> CommandIgnore.
- e. Ready-mode is only possible if the unit is already in standby, otherwise response will be kOK -> CommandIgnore.
- f. Possible answers in priority order:
 - o StatusMANUAL (System halt, needs inspection and initialization)
 - o StatusERROR (errorcode activated, command resend)
 - o StatusSLEEP (Standby is activated)
 - o StatusBUSY (Command in progress)
 - o StatusRECAP (Decap succesful, caps on ejector pins)
 - o StatusOK (Idle / Ready).
- g. Changing cartridge is only possible with no caps on pins, otherwise respond will be cOK -> CommandIgnore.

2. PC to Decapper/Recapper

Initialize System

Send (ASCII)	Z
Acknowledge (ACK)	<STX><ACK><ETX> <STX>ZOK<ETX>
Answer (successful operation)	<STX>ZDONE<ETX>
Answer (failed operation)	<STX>HomeERROR<ETX>
State (successful operation)	<STX>StatusOK<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	Clear all errors, reset errorstate and run the power-on sequence again. "ACK" is handshake. "ZOK" is confirming start of operation. "ZDONE" is sent when operation is complete. Timieout error sends "HomeERROR" and Status changes to "StatusMANUAL". This sequence will not drop caps.

Start Decap

Send (ASCII)	h
Acknowledge (ACK)	<STX><ACK><ETX> <STX>hOK<ETX>
Answer (successful operation)	<STX>DecapDONE<ETX>
Answer (failed operation)	<STX>DecapERROR<ETX>
State (successful operation)	<STX>StatusRECAP<ETX>
State (failed operation)	<STX>StatusERROR<ETX> / <STX>StatusMANUAL<ETX>
Comments	Runs a decap sequence. "ACK" is a handshake. "hOK" is confirming start of operation. "DecapDONE" is sent when sequence is complete. Status is changed to "StatusRecap" indicating caps on pins. Timeout or error detection will result in retry until condition is met. Failure result in "DecapERROR" and Status to "StatusERROR" if error is 113 or 114 and "StatusMANUAL" if anything else. See note 'a' in "Additional Notes" on page 2.

Start Recap

Send (ASCII)	i
Acknowledge (ACK)	<STX><ACK><ETX> <STX>iOK<ETX>
Answer (successful operation)	<STX>RecapDONE<ETX>
Answer (failed operation)	<STX>RecapERROR<ETX>
State (successful operation)	<STX>StatusOK<ETX>
State (failed operation)	<STX>StatusERROR<ETX> / <STX>StatusMANUAL<ETX>
Comments	Runs a recap sequence. "ACK" is a handshake. "iOK" is confirming start of operation. "RecapDone" is sent when sequence is complete. Status is changed to "StatusOK" indicating no caps on pins. Timeout or error detection will result in retry until condition is met. Failure result in "RecapERROR" and Status to "StatusERROR" if error is 117 or 118 and "StatusMANUAL" if anything else. See note 'b' in "Additional Notes" on page 2.

Retry Decap/Recap

Acknowledge (ACK)	<STX>RetryDECAP<ETX> or <STX>RetryRECAP<ETX>
Comments	<i>If fault detection, unit will retry with setpoint 45 & 46 (45 = recap, 46 = decap) as condition. "RetryDECAP/RetryRECAP" indicate start of operation. This will continue until condition is met, resulting in failed or successful operation (see Decap / Recap respectively).</i>

Store

Send (ASCII)	b
Acknowledge (ACK)	<STX><ACK><ETX> <STX>bOK<ETX>
Answer (successful operation)	<STX>StoreDONE<ETX>
Answer (failed operation)	<STX>StoreERROR<ETX>
State (successful operation)	<STX>StatusOK<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	Runs a store operation, used to store caps in special rack. Caps on pins is a prerequisite. "ACK" handshake. "bOK" indicate start of operation. "StoreDONE" indicates operation complete. Timeout error will result in the tray being presented with "LoadOK" and response of "StoreERROR". See note ' c ' in " Additional Notes " on page 2. !!!WARNING DOES NOT WORK IN V44, USE DECAP / RECAP WITH STORE RACK FOR AUTOSELECTION INSTEAD!!!

Go into Standby-mode

Send (ASCII)	j
Acknowledge (ACK)	<STX><ACK><ETX> <STX>jOK<ETX>
Answer (successful operation)	<STX>StandbyDONE<ETX>
Answer (failed operation)	<STX>StandbyERROR<ETX>
State (successful operation)	<STX>StatusSLEEP<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	Unit goes into low-power standby mode. "StatusOK" is a prerequisite for this command. "ACK" is a handshake. "jOK" indicates operation start. "StandbyDONE" indicates successful operation, "StandbyERROR" indicates operation failed. Status will change to "StatusSLEEP" if successful or "StatusERROR" if failed. See note 'd' in "Additional Notes" on page 2.

Go into Ready-mode

Send (ASCII)	k
Acknowledge (ACK)	<STX><ACK><ETX> <STX>kOK<ETX>
Answer (successful operation)	<STX>ReadyDONE<ETX>
Answer (failed operation)	<STX>ReadyERROR<ETX>
State (successful operation)	<STX>StatusOK<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	Unit goes into idle mode. "StatusSLEEP" is a prerequisite for this command. "ACK" is a handshake. "kOK" indicates operation start. "StandbyDONE" indicates successful operation, "StandbyERROR" indicates operation failed. Status will change to "StatusSLEEP" if successful or "StatusERROR" if failed. See note 'e' in "Additional Notes" on page 2.

Open Tray

Send (ASCII)	f
Acknowledge (ACK)	<STX><ACK><ETX> <STX>fOK<ETX>
Answer (successful operation)	<STX>OpenDONE<ETX>
Answer (failed operation)	<STX>OpenERROR<ETX>
State (successful operation)	<STX>StatusOK<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	Moves the stage out into load position. "ACK" is a handshake. "fOK" indicates start of operation. If successful "OpenDONE" indicates end of operation. Status will change to "StatusOK". If failed response will be "OpenERROR" and Status will change to "StatusERROR". NOTE: This command opens the safety door.

Close Tray

Send (ASCII)	g
Acknowledge (ACK)	<STX><ACK><ETX> <STX>gOK<ETX>
Answer (successful operation)	<STX>CloseDONE<ETX>
Answer (failed operation)	<STX>CloseERROR<ETX>
State (successful operation)	<STX>StatusOK<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	Moves the stage in to Decap/Recap position. "ACK" is a handshake. "gOK" indicates start of operation. If successful "CloseDONE" indicates end of operation. Status will change to "StatusOK". If failed response will be "CloseERROR" and Status will change to "StatusERROR".

Ask Status

Send (ASCII)	a
Acknowledge (ACK)	<STX><ACK><ETX> <STX>aOK<ETX>
Answer (successful operation)	e.g. <STX>StatusOK<ETX>
Comments	Sends the current Status of the unit to operator. "ACK" is handshake. "aOK" indicates start of operation. If successful returns comma-seperated response with status and errorcode. e.g. "StatusOK" or "StatusMANUAL". There is no failure to this command. See note f in "Additional Notes" on page 2.

Cartridge Eject

Send (ASCII)	c
Acknowledge (ACK)	<STX><ACK><ETX> <STX>cOK<ETX>
Answer (successful operation)	<STX>CarEjectDONE<ETX>
Answer (failed operation)	<STX>CarEjectERROR<ETX>
State (successful operation)	<STX>StatusCAREJECT<ETX>
State (failed operation)	<STX>StatusERROR<ETX> / <STX>StatusMANUAL<ETX>
Comments	Ejects the inserted cartridge onto tray. "ACK" is handshake. "COK" indicates start of operation. "CarEjectDONE" indicates end of operation. If failure the response "CarEjectERROR". Status will be "StatusERROR" for error 142 operation and "StatusMANUAL" for anything else. as there is no cartridge present if succesful or timeout if failure. Use "Ask Error" to troubleshoot. NOTE: Tray must be empty and no caps on pins.

Cartridge Load

Send (ASCII)	C
Acknowledge (ACK)	<STX><ACK><ETX> <STX>COK<ETX>
Answer (successful operation)	<STX>CarLoadDONE<ETX> <STX>ExtCarLoadDONE<ETX> <STX>onnOK<ETX> (where 'nn' is the profile number)
Answer (failed operation)	<STX>CarLoadERROR<ETX>
State (successful operation)	<STX>StatusOK<ETX>
State (failed operation)	<STX>StatusERROR<ETX> / <STX>StatusMANUAL<ETX>
Comments	<p>Picks up the cartridge loaded on tray. "ACK" is handshake. "DOK" indicates start of operation. "CarLoadDONE" indicates end of operation. If failure the response "CarLoadERROR". Status will be "StatusOK" if successful and "StatusERROR" if error 143 or 144 and return to Cartridge Eject sequence or "StatusMANUAL" if anything else.</p> <p>If profile 16-96, "ProfileLoadOK" if profile exists; "ProfileLoadERROR" if profile does not exist or is invalid.</p>

Move Tray from Load Position (S3) to Extended Position (S127)

Send (ASCII)	t
Acknowledge (ACK)	<STX><ACK><ETX> <STX>tOK<ETX>
Answer (successful operation)	<STX>tOK<ETX>
Answer (failed operation)	<STX>tERROR<ETX>
Comments	<p>When the tubes have been decapped, and the tray is in the load position (S3), command 't' will cause the tray to extend further, to the position defined in S127 (M2 Pos Extend). The tray can then be retracted back to position S3 using command 'T'. The tray can also be moved in step distances between S3 and S127. This distance is defined in setpoint 88 (M2 Pos Increment). To step out, command 's' is used, whilst stepping in is achieved using command 'S'. The movement is limited when using 's' and 'S', so the tray can move in not less than S3, nor greater than S127.</p> <p>Fails if the tray was not already at position defined in S3.</p>

Move Tray from Extended Position (S127) to Load Position (S3)

Send (ASCII)	T
Acknowledge (ACK)	<STX><ACK><ETX> <STX>TOK<ETX>
Answer (successful operation)	<STX>TOK<ETX>
Answer (failed operation)	<STX>TERROR<ETX>
Comments	<p>When the tubes have been decapped, and the tray is in the load position (S3), command 't' will cause the tray to extend further, to the position defined in S127 (M2 Pos Extend). The tray can then be retracted back to position S3 using command 'T'. The tray can also be moved in step distances between S3 and S127. This distance is defined in setpoint 88 (M2 Pos Increment). To step out, command 's' is used, whilst stepping in is achieved using command 'S'. The movement is limited when using 's' and 'S', so the tray can move in not less than S3, nor greater than S127.</p> <p>Succeeds if the tray was already fully extended. Fails if the tray was only as position S3.</p>

Increment Tray from Load Position (S3) by a Number of Steps Defined by S88

Send (ASCII)	s
Acknowledge (ACK)	<STX><ACK><ETX> <STX>sOK<ETX>
Answer (successful operation)	<STX>sOK<ETX>
Answer (failed operation)	<STX>sERROR<ETX>
Comments	<p>When the tubes have been decapped, and the tray is in the load position (S3), command 't' will cause the tray to extend further, to the position defined in S127 (M2 Pos Extend). The tray can then be retracted back to position S3 using command 'T'. The tray can also be moved in step distances between S3 and S127. This distance is defined in setpoint 88 (M2 Pos Increment). To step out, command 's' is used, whilst stepping in is achieved using command 'S'. The movement is limited when using 's' and 'S', so the tray can move in not less than S3, nor greater than S127.</p> <p>Succeeds if the tray is less extended than S127 (but is at S3 or more). Fails if the tray is already at S127, or is less than S3.</p>

Retract Tray from Extended Position (S127) by Number of Steps Defined by S88

Send (ASCII)	S
Acknowledge (ACK)	<STX><ACK><ETX> <STX>SOK<ETX>
Answer (successful operation)	<STX>SOK<ETX>
Answer (failed operation)	<STX>SERROR<ETX>
Comments	<p>When the tubes have been decapped, and the tray is in the load position (S3), command 't' will cause the tray to extend further, to the position defined in S127 (M2 Pos Extend). The tray can then be retracted back to position S3 using command 'T'. The tray can also be moved in step distances between S3 and S127. This distance is defined in setpoint 88 (M2 Pos Increment). To step out, command 's' is used, whilst stepping in is achieved using command 'S'. The movement is limited when using 's' and 'S', so the tray can move in not less than S3, nor greater than S127.</p> <p>Succeeds if the tray is more extended than S3. Fails if the tray move would cause it to move to a position less than S3.</p>

Reset Cartridge counter Query

Send (ASCII)	X NOTE: This is a capital X.
Acknowledge (ACK)	<STX><ACK><ETX> <STX>XOK<ETX>
Answer (successful operation)	<STX>CarResetDONE<ETX>
Comments	<p>Reset the cartridge counter. "ACK" is handshake. "XOK" indicates start of operation. "CarResetOK" indicates successful operation. There is no failure to this command.</p>

Firmware Query

Send (ASCII)	V
Acknowledge (ACK)	NOTE: This is a capital V.
Answer (successful operation)	<STX><ACK><ETX> <STX>VOK<ETX>
Comments	<STX>xxxx,yyyy,zzzz<ETX> If successful sends a comma-separated response with information to operator: xxxx = Unit firmware version, yyyy = Touchscreen firmware version, zzzz = Lightcurtain firmware version "ACK" is handshake. "VOK" is start of operation. There is no failure to this command. NOTE: Response is always four digits long, separated by a comma.

Cartridge details Query

Send (ASCII)	N
Acknowledge (ACK)	<STX><ACK><ETX> <STX>NOK<ETX>
Answer (successful operation)	<STX>xxx,yyyyy,zzzzzzzz<ETX>
Comments	If successful sends a comma-separated response with information to operator: xxx = Cartridge profile, yyyyyy = Cartridge cycle counter, zzzzzzzz = Cartridge serial. "ACK" is handshake. "NOK" is start of operation. There is no failure to this command. NOTE: Cartridge serial ALWAYS read "00000000", as it is not implemented.

Eject Caps

Send (ASCII)	5
Acknowledge (ACK)	<STX><ACK><ETX> <STX>50K<ETX>
Answer (successful operation)	<STX>EjectDONE<ETX>
Answer (failed operation)	<STX>EjectERROR<ETX>
State (successful operation)	<STX>StatusMANUAL<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	<p>Home caphead. This will eject any caps loaded on cap drivers. "ACK" is handshake. "50K" is start of operation. Response if success: "EjectDONE". Response if failure "EjectERROR". This command will check and perform "Tray Close" if not performed. Status will always be in "StatusMANUAL". This command will always open safety door</p> <p>NOTE: This command is only available in StatusMANUAL.</p>

Head Up

Send (ASCII)	6
Acknowledge (ACK)	<STX><ACK><ETX> <STX>60K<ETX>
Answer (successful operation)	<STX>HeadDONE<ETX>
Answer (failed operation)	<STX>HeadERROR<ETX>
State (successful operation)	<STX>StatusMANUAL<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	<p>Home the Z-axis. Any caps will stay loaded. "ACK" is handshake. "60K" is start of operation. Success is "HeadDONE". Failure is "HeadERROR". Status is always "StatusMANUAL".</p> <p>NOTE: This command is only available in StatusMANUAL.</p>

Safety Door Open

Send (ASCII)	7
Acknowledge (ACK)	<STX><ACK><ETX> <STX>7OK<ETX>
Answer (successful operation)	<STX>DoorDONE<ETX>
Answer (failed operation)	<STX>DoorERROR<ETX>
State (successful operation)	<STX>StatusMANUAL<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	<p>Opens the safety door. "ACK" is handshake. "7OK" is start of operation. If successful response is "DoorDONE". If failure response is "DoorERROR". Status will always be "StatusMANUAL"</p> <p>NOTE: This command is only available in StatusMANUAL.</p>

Ask Error Query

Send (ASCII)	8
Acknowledge (ACK)	<STX><ACK><ETX> <STX>8OK<ETX>
Answer (successful operation)	<STX>xxx<ETX>
Comments	<p>If successful sends a comma-separated response with information to operator: xxx = errorcode</p>

Safety Door Off

Send (ASCII)	-
Acknowledge (ACK)	<STX><ACK><ETX> <STX>-OK<ETX>
Answer (successful operation)	<STX>DoorOFFDONE<ETX>
Comments	<p>Disable safety door operation until next power cycle. Safetydoor will open automatically if safety door operation is disabled.</p> <p>NOTE: At power-up, safety door is enabled.</p>

Safety Door On

Send (ASCII)	+
Acknowledge (ACK)	<STX><ACK><ETX> <STX>+OK<ETX>
Answer (successful operation)	<STX>DoorONDONE<ETX>
Comments	Re-enables safety door operation. NOTE: At power-up, safety door is enabled.

Initialize but keep Caps on Pins

Send (ASCII)	z
Acknowledge (ACK)	<STX><ACK><ETX> <STX>zOK<ETX>
Answer (successful operation)	<STX>zDONE<ETX>
Answer (failed operation)	<STX>HomeERROR<ETX>
State (successful operation)	<STX>StatusMANUAL<ETX>
State (failed operation)	<STX>StatusMANUAL<ETX>
Comments	(DEPRECATED) Runs Initialize without dropping caps, in case the unit was stopped with caps on pins. This will reset errorstate and home unit. Status will change to "StatusRECAP" and "Recap" is possible. NOTE: This command is only available in StatusMANUAL.

Disable error detection in Decap and Recap

Send (ASCII)	l NOTE: This is a lower case 'L', not an upper case 'I'.
Acknowledge (ACK)	<STX><ACK><ETX> <STX>lOK<ETX>
Answer (successful operation)	<STX>ErrorDetectOFF<ETX>
Comments	This will set flag to disable light curtain error detection in decap and recap (error 135 and 136). Unit will always finish decap/recap. NOTE: At power-up, errordetection is enabled.

Enable error detection in Decap and Recap

Send (ASCII)	L
Acknowledge (ACK)	<STX><ACK><ETX> <STX>LOK<ETX>
Answer (successful operation)	<STX>ErrorDetectON<ETX>
Comments	This will set flag to enable light curtain error detection in decap and recap (error 135 and 136). NOTE: At power-up, errordetection is enabled.

Enable "dry-run" mode

Send (ASCII)	d
Acknowledge (ACK)	<STX><ACK><ETX> <STX>dOK<ETX>
Answer (successful operation)	<STX>DryRunON<ETX>
Comments	This enables dry-run mode. The unit will stop and wait for user interaction upon error detection of light curtain (error 114,118,135 and 136). NOTE: Only available with touchscreen firmware V14 or above.

Disable "dry-run" mode

Send (ASCII)	D
Acknowledge (ACK)	<STX><ACK><ETX> <STX>DOK<ETX>
Answer (successful operation)	<STX>DryRunOFF<ETX>
Comments	This disables dry-run mode, the unit will stop and wait for user interaction upon error detection of light curtain (error 114,118,135 and 136). NOTE: Only available with touchscreen firmware V14 or above.

Extended Status Query

Send (ASCII)	e
Acknowledge (ACK)	<STX><ACK><ETX> <STX>eOK<ETX>
Answer (successful operation)	<STX>xxxxxxxxxx<ETX>
Comments	Extended Status of the device, returns a string bitmask with settings of IntelliXcap. Currently from MSB to LSB: CAPS_ON_PINS(1bit), ENABLE_DRY_RUN(1bit), DISABLE_LIGHTCURTAIN(1bit), DISABLE_SAFETY_DOOR_RS232(1bit), ENABLE_STAGE(1bit), SCREW_CAPS_ON(1bit), CARTRIDGE_INSTALLED(1bit), STANDBY_ACTIVE(1bit), STAGE_POS(1bit), RECOVER_MODE(1bit), ESTOP_ACTIVE(1bit), TIME_FOR_SERVICE(1bit).

Profile Query

Send (ASCII)	E
Acknowledge (ACK)	<STX><ACK><ETX> <STX>EOK<ETX>
Answer (successful operation)	<STX>xxxxx<ETX>
Comments	Extended Status of the device, returns a string bitmask with settings of current profile. Currently from MSB to LSB: PROFILE:NUMBER (2int), COMMUNICATION_PROTOCOL(1int), DECAP_MAX_RETRY (1int), RECAP_MAX_RETRY(1int)

Manual Invoke Retry Decap

Send (ASCII)	Q
Acknowledge (ACK)	<STX><ACK><ETX> <STX>hOK<ETX>
Answer (successful operation)	<STX>RetryDECAP<ETX> <STX>DecapDONE<ETX>
Answer (failed operation)	<STX>DecapERROR<ETX>
State (successful operation)	<STX>StatusOK<ETX>
State (failed operation)	<STX>StatusERROR<ETX> / <STX>StatusMANUAL<ETX>
Comments	After a successful Decap, you have to use this command to force a Decap Retry. NOTE: This function requires lightcurtain OFF.