Swift Pro Potocol

1)Introduction

- uArm Gcode is an important part of the uArm software.
- Based on the standard gCode protocol, we add a new protocol head in front of the Gcode so that it can be more easily to use and debug.
- What's more, it is designed to be compatible with the standard Gcode. (We offer the code of decode the

standard Gcode)

2)Example

Sending command from PC "#25 G0 X180 Y0 Z150 F200"
//move to [180,0,150] with the speed 200mm/min

Reply from uArm "\$25 ok"

3)Commands(TBD)-

Command can be divided into two parts:

Command with underline: it's the new added protocol head.

- The command from PC starts with '#', while the command from uArm starts with '\$'.
- And the data following the symbol decided by the PC, and the reply from the uArm should have the same

data which indicates it finish the command. (In the example above, PC sends the command with '#25' and

uArm replies the command with'\$25')

Command without the underline: it's the standard Gcode.

Caution:

- 1. There should be blank space between each parameter;
- 2. The letters in the command should be capitalized;

GCode Command (v1.2)	Description	Feedback	Remarks
1. #n is used for the debug	•		
(For Example: G2202 N0 V90\n)			
2. '\n' is the symbol of line	feed.		
	Moving Command (parar	neters are in underline)	
# <u>n</u> G0 X <u>100</u> Y <u>100</u> Z <u>100</u>	Quick positioning, Move	\$n ok \n	
F <u>200</u> \n	to XYZ(mm), F is	\$n Ex \n	
	speed(mm/min) , F=	(refer to Err output)	
	0~200		
# <u>n</u> G1 X <u>100</u> Y <u>100</u> Z <u>100</u>	Linear interpolation,	\$n ok \n	Fix V3.2.0 interface,
F <u>100</u> \n	Move to XYZ(mm), F is	\$n Ex \n	delete laser mode,
	speed(mm/min) , F=	(refer to Err output)	G1,G0 control laser.
	0~200		
# <u>n</u> G2004 P <u>1000</u> \n	Delay microsecond	\$n ok \n	
		\$n Ex \n	
// 00004 0400 D00 H00		(refer to Err output)	
# <u>n</u> G2201 S <u>100</u> R <u>90</u> H <u>80</u>	Polar coordinates, S is	\$n ok \n	
F1 <u>00</u> \n	stretch(mm), R is	\$n Ex \n	
	rotation(degree),H is	(refer to Err output)	
	height(mm), F is		
	speed(mm/min),		
#n C2202 NO V/00 F100\n	F=0~200 Move the motor to the	th ok \n	
# <u>n</u> G2202 N <u>0</u> V <u>90</u> F1 <u>00</u> \n		\$n ok \n	
	position ,N is ID of joints(0~3),V is	\$n Ex \n	
	angle(0 \sim 180) , F is	(refer to Err output)	
	speed(mm/min),		
	F=0~200		
#n G2204 X10 Y10 Z10	Relative displacement	\$n ok \n	
F100\n	The factor of the production of the factor o	\$n Ex \n	
		(refer to Err output)	
#n G2205 S10 R10 H10	Polar coordinates for	\$n ok \n	
F <u>100</u> \n	relative displacement	\$n Ex \n	
	'	(refer to Err output)	
# <u>n</u> G2206 B <u>90</u> L <u>70</u> R <u>50</u>	Move the motor to the	\$n ok \n	Support v4.5.0 or later
F <u>100</u> \n	position ,B is base	\$n Ex \n	
	motor,L is left motor, R is	(refer to Err output)	
	right motor,		
	angle(0~180) , F is		
	speed(mm/min),		
	F=0~200		
	System Command (parar	neters are in underline)	
# <u>n</u> S1000 V <u>0</u>	Control Arm motion	\$n ok \n	Support v4.5.0 or later
	0:stop motion	\$n Ex \n	

	1:start motion	(refer to Err output)	
# <u>n</u> S1100	motion control reset	\$n ok \n	Support v4.5.0 or later
		\$n Ex \n	
		(refer to Err output)	
	Setting Command (paran	neters are in underline)	
# <u>n</u> M17\n	Attach all the joint	\$n ok \n	
	motors	\$n Ex \n	
		(refer to Err output)	
# <u>n</u> M204 A <u>1.3</u> \n	Set accelerations and	\$n ok \n	
	save, A=0~5, large	\$n Ex \n	
	accelerations maybe	(refer to Err output)	
	cause out of step,		
	suggest set as 1.3		
# <u>n</u> M2019\n	Detach all the joint	\$n ok \n	
	motors	\$n Ex \n	
		(refer to Err output)	
# <u>n</u> M2120 V <u>0.2</u> \n	Set time cycle of	\$n ok \n	
	feedback, return	\$n Ex \n	
	Cartesian coordinates, V	(refer to Err output)	
	is time(seconds)	@3 X154.71 Y194.91	
		Z10.21 R90\n	
# <u>n</u> M2121\n	Stop feedback	\$n ok \n	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> M2122 V <u>1</u> \n	Report (@9 V0) when	\$n ok \n	
	stop.	\$n Ex \n	
	V1: Enable	(refer to Err output)	
	V0: Disable		
# <u>n</u> M2123 V <u>1</u> \n	closed-loop stepper	\$n ok \n	Support v4.2.0 or later
	system.	\$n Ex \n	
	V1: Enable	(refer to Err output)	
	V0: Disable		
# <u>n</u> M2201 N <u>0</u> \n	Attach motor, N is ID of	\$n ok \n	
	joints(0~3)	\$n Ex \n	
		(refer to Err output)	
# <u>n</u> M2202 N <u>0</u> \n	Detach motor, N is ID of	\$n ok \n	
	joints(0~3)	\$n Ex \n	
		(refer to Err output)	
# <u>n</u> M2203 N <u>0</u> \n	Check if the motor is	\$n ok \n	
	attached, N is ID of	\$n Ex \n	
	joints(0~3)	(refer to Err output)	
# <u>n</u> M2210 F <u>1000</u> T <u>200</u> \n	buzzer,F is frequency, T is	\$n ok \n	
	time (ms)	\$n Ex \n	
		(refer to Err output)	

### M2211 NO A200 TIVN internal EEPROM N(0-2,0 is internal EEPROM), 2 is SYS_E2PROM), 2 is SYS_E2PROM), 3 is address, 1 is type (1 char,2 int.4 float) ###################################	#p M2211 NO A200 T1\p	Read EEPROM N(0~2,0 is	\$n ok \n	This interface does not
USR_E2PROM, 2 is SYS_E2PROM), A is address. T is type (1 char,2 int.4 float) #n_M2212_N0_A200_T1	# <u>II</u> WZZII N <u>O</u> A <u>ZOO</u> I <u>I</u> (II	,		
#M M2213 VQ\n Default function of base buttons (0 false, 1 true) Sn ok \n Sn ok \n				support temporarily
#m M2212 No A200 T1 Write EPROM N(0-2,0 is internal EPROM.1 is USR_E2PROM,2 is SYS_E2PROM), A is address, T is type (1 char2,1 int,4 float) Vis the input data #m M2213 Vo\n Default function of base buttons (0 false, 1 true) #m M2215 \ Reset Grbl parameter #m M2220 X100 Y100 Z100 A200 T1 Convert angle of joints to coordinates #m M2221 B0 L50 R50\n Convert angle of joints to coordinates #m M2221 X10\n V100 Y100 Z100 Convert angle of joints to coordinates #m M2231 V1\n pump V1 working, V0 stop of the M2233 V1\n stop stop with the manual properties of the moutput) #m M2232 V1\n stop stop with the moutput of the			(refer to Err output)	
#n M2212 N0 A200 T1 Write EEPROM N(O-2.0 is internal EEPROM, 1 is USR E2PROM, 2 is SYS_E2PROM, A is address, T is type (1 char, 2 int. 4 float)V is the input data #n M2213 V0\n Default function of base buttons (0 false, 1 true) #n M2215\n Reset Grbl parameter #n M2220 X100 Y100 Convert coordinates to angle of joints or coordinates #n M2221 B0 L50 R50\n Check if it can reach, P1 polar, P0 Cartesian coordinates #n M2231 V1\n Pull M2232 V1\n Pull M2232 V1\n Pull M2233 V1\n Stop #n M2234 V1\n Stop		1		
#_n M2212 No A200 T1 Virite EEPROM N(0~2.0 is internal EEPROM, 2 is USR_E2PROM), a is USR_E2PROM), a is address, T is type (1 char 2 int, 4 float)V is the input data #_n M2213 Volvn		7 ' '		
V10\n internal EEPROM.1 is USR E2PROM.2 is SYS_E2PROM.2 is SYS_E2PROM.3 is address. T is type (1 char.2 int.4 float)V is the input data \$n ok \n support temporarily #n M2213 V0\n Default function of base buttons (0 false, 1 true) \$n ok \n support temporarily #n M2215\n Reset Grbl parameter shout of palse, 1 true) \$n ok \n sho k\n sho k		· ·		
USR_E2PROM, 2 is SYS_E2PROM, A is address, T is type (1 char, 2 int, 4 float) V is the input data #_M_M2213 V_0\n #_M_M2213 V_0\n #_M_M2215\n #_M_M2215\n #_M_M2220 X_100 Y_100 Convert coordinates to angle of joints #_M_M2221 B_0 L50 R50\n #_M_M2221 B_0 L50 R50\n #_M_M2222 X_100 Y_100 Convert angle of joints to coordinates #_M_M2222 X_100 Y_100 Convert angle of joints to coordinates #_M_M2222 X_100 Y_100 Convert angle of joints to coordinates #_M_M2222 X_100 Y_100 Z_100 P_0\n #_M_M2222 X_100 Y_100 Z_100 P_0\n #_M_M2222 X_100 Y_100 Z_100 P_0\n #_M_M2221 V_1\n #_M_M2231 V_1\n #_M_M2231 V_1\n #_M_M2231 V_1\n #_M_M2232 V_1\n #_M_M2233 V_1\n #_M_M2233 V_1\n laser V1 working, V0 stop Sn Ex \n (refer to Err output) #_M_M2234 V_1\n laser V1 working, V0 stop Sn Ex \n (refer to Err output) #_M_M2234 V_1\n laser V1 working, V0 stop Sn Ex \n (refer to Err output) #_M_M2234 V_1\n Enable/disable Bluetooth (1:enable, 0:disable) Sn Ex \n (refer to Err output) This interface does not support temporarily This interface does not support temporarily This interface does not support tem	= = = =	,	·	
#M M2213 VQ\n Default function of base buttons (0 false, 1 true) #m M2215\n Reset Grbl parameter false for output) #m M2220 X100 Y100 angle of joints of poor output the face output function of base buttons (0 false, 1 true) #m M2221 BQ L5Q R5Q\n Poor false for output) #m M2221 BQ L5Q R5Q\n Poor false for output) #m M2221 ND Y100 Y100 Convert coordinates to angle of joints or coordinates #m M2221 BQ L5Q R5Q\n Poor false for output) #m M2222 X100 Y100 Z100 Convert angle of joints to coordinates #m M2222 X100 Y100 Z100 Convert angle of joints to coordinates #m M2222 X100 Y100 Z100 Convert angle of joints to coordinates #m M2222 X100 Y100 Z100 Convert angle of joints to coordinates #m M2222 X100 Y100 Z100 Convert angle of joints to coordinates #m M2222 X100 Y100 Z100 Convert angle of joints to coordinates #m M2222 X100 Y100 Z100 Convert angle of joints to coordinates #m M2222 X100 Y100 Z100 Convert angle of joints to coordinates #m M2231 V1\n polar, PO Cartesian coordinates #m M2231 V1\n pump V1 working, V0 sho k \n stop #m M2232 V1\n gripper V1 close, V0 open #m M2232 V1\n falser V1 working, V0 stop #m M2233 V1\n laser V1 working, V0 stop #m M2234 V1\n Enable/clisable Bluetooth (1:enable, 0:disable) #m M2234 V1\n Enable/clisable Bluetooth (1:enable, 0:disable) #m K2 X n (refer to Err output) #m K2 X n (refer to Err output) #m M2234 V1\n Enable/clisable Bluetooth (1:enable, 0:disable) #m K2 X n (refer to Err output) #m K2 X n (refer to Err output) #m K2 X n (refer to Err output) #m M2234 V1\n Enable/clisable Bluetooth (1:enable, 0:disable) #m K2 X n (refer to Err output)	V <u>10</u> \n	internal EEPROM,1 is	\$n Ex \n	support temporarily
#n M2213 V0\n #n M2213 V0\n Default function of base buttons (0 false, 1 true) #n M2215\n Reset Grbl parameter #n M2220 X100 Y100 Convert coordinates to angle of joints of coordinates #n M2221 B0 L50 R50\n #n M2222 X100 Y100 Z100 #n M2222 X100 Y100 Convert angle of joints to coordinates #n M2221 B0 L50 R50\n #n M2221 V1\n #n M2231 V1\n #n M2231 V1\n #n M2232 V1\n #n M2233 V1\n m M2233 V1\n laser V1 working, V0 stop first or many many many many many many many many		USR_E2PROM, 2 is	(refer to Err output)	
#n M2213 V0\n Potential function of base buttons (0 false, 1 true) #n M2215\n Reset Grbl parameter #n M2220 X100 Y100 Convert coordinates to angle of joints occordinates #n M2221 B0 L50 R50\n Convert angle of joints occordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints occordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints occordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints occordinates #n M2221 B0 L50 R50\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 P0\n Convert angle of joints to coordinates #n M2231 V1\n polar, P0 Cartesian coordinates #n M2231 V1\n pump V1 working, V0 Sn ok \n Sn Ex \n (refer to Err output) #n M2232 V1\n gripper V1 close, V0 open Sn ok \n		SYS_E2PROM), A is		
#n M2213 V0\n Default function of base buttons (0 false, 1 true) #n M2215\n #n M2215\n Reset Grbl parameter #n M2220 X100 Y100 Convert coordinates to angle of joints #n M2221 B0 L50 R50\n #n M2221 R0 L50 R50\n #n M2222 X100 Y100 Z100 #n M2231 V1\n #n M2231 V1\n #n M2231 V1\n #n M2232 V1\n #n M2233 V1\n #n M2233 V1\n #n M2234 V1\n #n M2234 V1\n #n M2234 V1\n Enable/disable Bluetooth \(n \n		address, T is type (1		
#m M2213 V@\n Default function of base buttons (0 false, 1 true)		char,2 int,4 float)V is the		
buttons (0 false, 1 true) (refer to Err output) #n M2215\n Reset Grbl parameter		input data		
#n M2215\n #n M2220 X100 Y100 Convert coordinates to angle of joints #n M2221 B0 L50 R50\n #n M2222 X100 Y100 Check if it can reach,P1 polar, P0 Cartesian coordinates #n M2231 V1\n #n M2231 V1\n #n M2232 V1\n #n M2233 V1\n #n M2233 V1\n #n M2233 V1\n #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n Fn Enable/disable Bluetooth (1:enable, 0:disable) Fn Ex \n (refer to Err output)	# <u>n</u> M2213 V <u>0</u> \n	Default function of base	\$n ok \n	This interface does not
#n M2215\n		buttons (0	\$n Ex \n	support temporarily
#n M2220 X100 Y100 angle of joints to angle of joints to coordinates to show the frequency of the first output) #n M2221 B0 L50 R50\n Convert angle of joints to coordinates to show the first output) #n M2221 B0 L50 R50\n Convert angle of joints to coordinates to show the first output) #n M2221 B0 L50 R50\n Convert angle of joints to coordinates show the first output) #n M2222 X100 Y100 Z100 Coordinates show the first output show the		false, 1 true)	(refer to Err output)	
#n M2220 X100 Y100 Convert coordinates to angle of joints Single Ordinates Single of joints Single Ordinates	#n M2215\n	Reset Grbl parameter	\$n ok \n	Add reset param
#_n M2220 X100 Y100	_	'	\$n Ex \n	<u>-</u>
#_n M2220 X100 Y100				
Z100\n angle of joints joint 0,L joint 1,R joints 2, 0~180) #n M2221 B0 L50 R50\n Convert angle of joints to coordinates \$\frac{n}{2}\$ ok \$\times \text{100}\$ Y100 Z100\n (refer to Err output) #n M2222 X100 Y100 Z100 P0\n Check if it can reach,P1 polar, P0 Cartesian coordinates \$\frac{n}{2}\$ ok V1\n (1 reachable, 0 unreachable) #n M2231 V1\n pump V1 working, V0 stop \$\frac{n}{2}\$ ok \n #n M2232 V1\n gripper V1 close, V0 open sh Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop \$\frac{n}{2}\$ ok \n #n M2234 V1\n laser V1 working, V0 stop \$\frac{n}{2}\$ ok \n #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$\frac{n}{2}\$ ok \n #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$\frac{n}{2}\$ ok \n #n Ex \n This interface does not support temporarily	#n M2220 X100 Y100	Convert coordinates to		
#n M2221 B0 L50 R50\n coordinates #n M2221 B0 L50 R50\n coordinates #n M2222 X100 Y100 Z100 #n M2231 V1\n #n M2231 V1\n #n M2231 V1\n #n M2232 V1\n #n M2232 V1\n #n M2232 V1\n #n M2232 V1\n #n M2233 V1\n #n M2233 V1\n #n M2234 V1			,	
#n M2221 B0 L50 R50\n coordinates #n M2221 B0 L50 R50\n coordinates #n M2222 X100 Y100 Z100 coordinates #n M2231 V1\n coordinates #n M2231 V1\n coordinates #n M2231 V1\n coordinates #n M2232 V1\n coordinates #n M2234 V1\n coord	2400 (11			
#n M2221 Bū L50 R50\n Convert angle of joints to coordinates #n M2222 X100 Y100 Z100 Check if it can reach,P1 polar, P0 Cartesian coordinates #n M2231 V1\n pump V1 working, V0 stop #n M2232 V1\n gripper V1 close, V0 open #n M2233 V1\n laser V1 working, V0 stop #n M2234 V1\n laser V1 working, V0 stop #n M2234 V1\n laser V1 working, V0 stop #n M2234 V1\n fractor and the first term output) #n M2234 V1\n laser V1 working, V0 stop #n Ex \n (refer to Err output) #n M2234 V1\n laser V1 working, V0 stop #n Ex \n (refer to Err output) #n M2234 V1\n laser V1 working, V0 stop #n Ex \n (refer to Err output) #n M2234 V1\n laser V1 working, V0 stop #n Ex \n (refer to Err output) #n M2234 V1\n laser V1 working, V0 stop #n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Ex \n (refer to Err output)			'	
#n M2221 B0 L50 R50\n Convert angle of joints to coordinates \$\(n \) ok \(\text{X}\)100 \(\text{Y}\)100 \(\text{Z}\)100\n #n M2222 \(\text{X}\)100 \(\text{Y}\)100 \(\text{Z}\)100 \(\text{Y}\)100 \(\text{Y}\)100 \(\text{Z}\)100 \(\text{Y}\)100 \(\			·	
coordinates #n M2222 X100 Y100 Z100 #n M2222 X100 Y100 Z100 Po\n Po\n #n M2231 V1\n #n M2231 V1\n #n M2232 V1\n #n M2232 V1\n #n M2232 V1\n #n M2232 V1\n #n M2233 V1\n #n M2233 V1\n #n M2234 V1\n #n M2234 V1\n #n M2234 V1\n #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n #n M2234 V1\n Enable, 0:disable) #n M2234 V1\n #n M2234 V1\n #n M2234 V1\n Enable, 0:disable) #n M2234 V1\n #n M2234 V1\n #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Ex \n (refer to Err output)	#n M2221 B0 L50 R50\n	Convert angle of joints to		
#n M2222 X100 Y100 Z100 Check if it can reach,P1 polar, P0 Cartesian coordinates \$n coordinates \$n Ex \n (refer to Err output) #n M2231 V1\n pump V1 working, V0 stop \$n Ex \n (refer to Err output) #n M2232 V1\n gripper V1 close, V0 open \$n ok \n \sn Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 shop \$n ok \n \sn Ex \n (refer to Err output) #n M2233 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable)	71 10 2221 Bo 230 1000 (1)	,		
#n M2222 X100 Y100 Z100 Check if it can reach,P1 polar, P0 Cartesian coordinates n Ex \n (refer to Err output) #n M2231 V1\n pump V1 working, V0 sn ok \n stop sn Ex \n (refer to Err output) #n M2232 V1\n gripper V1 close, V0 open sn ok \n sn Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop sn ok \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop sn ok \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) sn ok \n sn Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) sn ok \n support temporarily (refer to Err output)		Coordinates		
PO\n polar, P0 Cartesian coordinates \$n Ex \n (refer to Err output) #n M2231 V1\n pump V1 working, V0 \$n ok \n \$n Ex \n (refer to Err output) #n M2232 V1\n gripper V1 close, V0 open \$n ok \n \$n Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop #n M2233 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n \$n Ex \n (refer to Err output) This interface does not support temporarily This interface does not support temporarily	#n M2222 V100 V100 7100	Chock if it can reach P1	, ,	
coordinates \$n Ex \n (refer to Err output) #n M2231 V1\n pump V1 working, V0 \$n ok \n \$n Ex \n (refer to Err output) #n M2232 V1\n gripper V1 close, V0 open \$n ok \n \$n Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop #n M2233 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n \$n ok \n (refer to Err output) This interface does not support temporarily This interface does not support temporarily		, , , , , , , , , , , , , , , , , , ,	,	
#n M2231 V1\n pump V1 working, V0 sn ok \n stop #n M2232 V1\n gripper V1 close, V0 open #n M2232 V1\n #n M2233 V1\n laser V1 working, V0 stop #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n frefer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n frefer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Err output)	P <u>U</u> \II		· ·	
#n M2231 V1\n pump V1 working, V0 stop #n Ex \n (refer to Err output) #n M2232 V1\n gripper V1 close, V0 open \$n ok \n \$n Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop #n M2233 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n #n M2234 V1\n #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Ex \n (refer to Err output) #n Ex \n (refer to Err output)		Coordinates		
stop \$n Ex \n (refer to Err output) #n M2232 V1\n gripper V1 close, V0 open \$n ok \n \$n Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop #n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n (refer to Err output) This interface does not support temporarily (refer to Err output)	#n M2221 \/1\ n	nump 1/1 working 1/0		
#n M2232 V1\n gripper V1 close, V0 open \$n ok \n \$n Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n M2234 V1\n frefer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) #n Ex \n (refer to Err output)	# <u>II</u> V ZZ31 V <u>1</u> \N			
#n M2232 V1\n gripper V1 close, V0 open \$n ok \n \$n Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop \$n ok \n \$n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n \$n Ex \n (refer to Err output) This interface does not support temporarily (refer to Err output)		stop		
\$n Ex \n (refer to Err output) #n M2233 V1\n laser V1 working, V0 stop \$n ok \n \$n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n \$n Ex \n (refer to Err output) This interface does not support temporarily (refer to Err output)	// A40000 \ /4\		, ,	
#n M2233 V1\n laser V1 working, V0 stop \$n ok \n \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n \n (refer to Err output) #n Ex \n	# <u>n</u> M2232 V <u>1</u> \n	gripper V1 close, V0 open		
#n M2233 V1\n laser V1 working, V0 stop \$n ok \n \$n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n support temporarily (refer to Err output)				
\$n Ex \n (refer to Err output) #n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n \$n Ex \n (refer to Err output) This interface does not support temporarily (refer to Err output)			, ,	
#n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n This interface does not support temporarily (refer to Err output)	# <u>n</u> M2233 V <u>1</u> \n	laser V1 working, V0 stop		Add laser interface
#n M2234 V1\n Enable/disable Bluetooth (1:enable, 0:disable) \$n ok \n support temporarily (refer to Err output)				
(1:enable, 0:disable) \$n Ex \n support temporarily (refer to Err output)			(refer to Err output)	
(refer to Err output)	# <u>n</u> M2234 V <u>1</u> \n	Enable/disable Bluetooth	\$n ok \n	This interface does not
		(1:enable, 0:disable)	\$n Ex \n	support temporarily
$\#\underline{n}$ M2240 N $\underline{1}$ V $\underline{1}$ \n Set the digital IO output $\$$ n ok \n Support v4.3.0 or later			(refer to Err output)	
	# <u>n</u> M2240 N <u>1</u> V <u>1</u> \n	Set the digital IO output	\$n ok \n	Support v4.3.0 or later

		\$n Ex \n	
		(refer to Err output)	
#n M2241 N1 V1\n	Set the digital IO	\$n ok \n	Support v4.3.0 or later
<u> </u>	direction (V1	\$n Ex \n	
	Output; V0 Input;)	(refer to Err output)	
#n M2245 Vbtname\n	Set the name of	\$n ok \n	This interface does not
Will will be visited the	Bluetooth, 11	\$n Ex \n	support temporarily
	letters limited	(refer to Err output)	oupport componently
#n M2400 S0\n	Set the mode of arm (0:	\$n ok \n	
<u></u> <u></u>	Standard 1:Laser 2:3D	\$n Ex \n	
	printing 3:Universal	(refer to Err output)	
	Holder 4: Pro 5: Plus 6:		
	Touch Pen)		
#n M2401\n	Set the current position	\$n ok \n	
_	into the	\$n Ex \n	
	reference position	(refer to Err output)	
#n M2410\n	Set the height zero point	\$n ok \n	
_		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> M2411 S <u>100</u> \n	Set the offset of end-	\$n ok \n	
	effector (mm)	\$n Ex \n	
		(refer to Err output)	
# <u>n</u> M2412 V <u>10</u> \n	Set the offset angle of	\$n ok \n	Support v4.2.0 or later
	end-effector(°)	\$n Ex \n	
		(refer to Err output)	
	Querying Command (para	meters are in underline)	
# <u>n</u> P2200\n	Get the current angle of	\$ <u>n</u> ok B <u>50</u> L <u>50</u> R <u>50</u> \n	
	joints	\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2201\n	Get the device name	\$ <u>n</u> ok <u>SwiftPro</u> \n	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2202\n	Get the hardware version	\$ <u>n</u> ok V <u>3.0.1</u> \n	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2203\n	Get the software version	\$ <u>n</u> ok V <u>4.0.0</u> \n	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2204\n	Get the API version	\$ <u>n</u> ok V <u>4.0.1</u> \n	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2205\n	Get the UID	\$ <u>n</u> ok V <u>0123456789AB</u> \n	
		\$n Ex \n	
		(refer to Err output)	

# <u>n</u> P2206 N <u>0</u> \n	Get the angle of number	\$ <u>n</u> ok V <u>80</u> \n	Add get the angle of
	0 joint	\$n Ex \n	end-effector interface
	(0~3)	(refer to Err output)	
# <u>n</u> P2220\n	Get current coordinates	\$ <u>n</u> ok X <u>100</u> Y <u>100</u> Z <u>100</u> \n	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2221\n	Get current polar	\$ <u>n</u> ok S <u>100</u> R <u>90</u> H <u>80</u> \n	
	coordinates	\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2231\n	Get the status of pump	\$ <u>n</u> ok V <u>1</u> \n (0 stop, 1	
		working, 2 grabbing	
		things)	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2232\n	Get the status of gripper	\$ <u>n</u> ok V <u>1</u> \n (0 stop, 1	
		working, 2 grabbing	
		things)	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2233\n	Get the status of limited	$$\underline{n}$ ok V1 \n (1 triggered, 0)$	
	switch	untriggered)	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2234\n	Get the status of power	$\frac{n}{n}$ ok $\frac{1}{n}$ (1 connected,	
	connection	0	
		unconnected)	
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2240 N <u>1</u> \n	Get the status of digital IO	\$ <u>n</u> ok V <u>1</u> \n (1 High, 0 Low)	Support v4.3.0 or later
		\$n Ex \n	
		(refer to Err output)	
# <u>n</u> P2241 N <u>1</u> \n	Get the status of analog	$\frac{n}{n}$ ok V295\n (return the	Support v4.3.0 or later
	10	data of ADC)	
		\$n Ex \n	
// DOO 10)		(refer to Err output)	
# <u>n</u> P2242\n	Get the default value of	\$ <u>n</u> ok B <u>2401</u> L <u>344</u>	
	AS5600 in each joint	R <u>1048</u> \n	
		\$n Ex \n	
// - P0400\	Object to the second second	(refer to Err output)	
# <u>n</u> P2400\n	Check current status	\$ <u>n</u> ok V <u>1</u> \n	
		(0: Standard; 1:Laser;2:3D	
		printing ;3:Universal	
		Holder ;4: Pro; 5: Plus; 6:	
		Touch Pen;)	

		\$n Ex \n		
		(refer to Err output)		
	事件扣	段告		
@1	Ready			
@3 X10 Y20 Z10 R90\n	Timed feedback, "M2120"			
@4 N0 V1\n	Report the button event.		This interface does not	
	N: 0 = Menu button, 1 =		support temporarily	
	Play button			
	V: 1 = Click, 2 = Long			
	Press			
@5 V1\n	Report event of power		This interface does not	
	connection		support temporarily	
@6 N0 V1\n	Report event of limit			
	switch in end-effector			
@7 temp error	Temperature error in 3D		This interface does not	
	printing		support temporarily	
@9 V0\n	Stop movement			
Err Output				
E20	Command not exist			
E21	Parameter error			
E22	Address out of range			
E23	Command buffer full			
E24	Power unconnected			
E25	Operation failure			

Different modes for uArm Swift Pro

Since different types of the end-effectors have different length and height, so we designed the command M2400,

which could help us to fit the uArm into different situations easily. With this command, there is no need to concern

about how to adjust the parameters for different situations.

Currently we offer 4 kinds of mode:

M2400 S0: Standard Suction mode (end-effector tools: Servo suction)

M2400 S1: Laser mode (end-effector tools: laser)

M2400 S2: 3D printing mode (end-effector tools: hot end)

M2400 S3: Universal holder mode (end-effector tools: universal holder)

M2400 S4: Pro Suction mode (end-effector tools: flat stepper suction)

M2400 S5: Plus Suction mode(end-effector tools: standard stepper suction)

M2400 S6: Touch Pen mode(end-effector tools: universal holder)