Smartto G-code Support V1.0

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2018.10.24

- Custom code (*),add the support printer at the below;
- The single code add'**\r**'or'**\n**', for SDcard and PC analysis code '**;**' followed is code comments,but it is the valid character for the wifi module;
- Some code only use the part function;
- Marked with the red is for 3Dwifi but not added on the printer.

1、 Specification description:

instruction	Define
Gnnn	Standard G code,eg:Move the motor to the some point.
Mnnn	M code.
Tnnn	T code,usually use for change the extruder.
nnn	Corresponding to the parameter data following the instruction or parameter identifier.
Snnn	Code for define the temp(eg).
Pnnn	Command parameters, set the time [ms].
Xnnn	X Coordinates, usually moved to nnn.
Ynnn	Y Coordinates, usually moved to nnn.
Znnn	Z Coordinates, move to nnn.
Fnnn	Speed at which the print head moves [min/mm].
Ennn	Length of extruded material [mm].
Nnnn	Line number. Used to request repeated transmissions in case of communication errors.
***nnn**	Check code. Used to check for communication errors.

2、 **G code** Instruction parsing

Instruction	Description
G0 - 1	Move straight to the specified position.
	G1 Xnnn Ynnn Znnn Ennn Fnnn
G2	Curved motion clockwise, unused
G3	Anti-clockwise arc movement, unused
G4	Suspend motor operation specified ms [s]. PIn milliseconds, S In seconds
	G4 Pnnn or G4 Snnn
G20	Set the unit to use in inches [INCH]
	G20

G21	Set the unit to be used in millimeters [mm].
	G21
G28	All axes return to the origin or specify a few axes *(X, Y, Z)* to return to the origin.
	G28 or G28 X0 or G28 Y0 or G28 Z0
G29	Calculate the tilt of the plane by nine points
	G29
G90	Set to use absolute coordinates.
	G90
G91	Set the relative coordinates.
	G91
G92	Reset the current coordinates, allowing the absolute zero of the program to be programmed, by resetting the current position to the specified value, no physical motion occurs. If G92 is not specified, all axes will be reset to zero.
	G92 or G92 Xnnn Ennn wait.

3、 **M code** Instruction parsing

Instruction	**Description**
M17	Enable all axes (x/y/z/e) motor, free movement of the axis is not allowed.
	M17
M18	All shaft motors are disabled and the motor is free.
	M18
M20	Read the list of root directory files in the SD card.
	M20, return G-code list of file names Return format: Begin file list\n Filename1\n Filename2\n ... End file list\n ok\r\n
M21	Initialize the SD card.
	M21 Return echo: SD init fail\n or echo: SD card ok\n
M23	Select the file name to print.
	M23 filename.gco Return successfully: File select succed!\r\n Failure return: Erro1\r\n
M24	Start/restore the file selected from the M23 command.

	M24 If successful return: Start Print\r\n
M25	Pause printing from the current position of the file selected by the M23 command.
	M25 If successful return: Stop Print\r\n
M26	Start printing settings file from one byte.
	M26 Snnn
M27	Report SD print status.
	M27
M30	Delete the specified SD card file.
	M30 filename.gco If successful return: delete file succeed ok\r\n Return if it fails: delete file fail\r\n
M80	Printer hibernation recovery, function is not perfect.
	M80
M81	Printer sleep, function is not perfect.
	M81
M84	All axes are prohibited from moving, so that the motor is in a free state. When the serial port is printed, the printer is returned and the serial port print mark is cleared.
	M84
M92	Provided for each axis parameter: steps per mm.
	M92 Xnnn Ynnn Znnn Ennn, M92 E1nnn wait
M104	Set the extrusion head temperature, T number for the extrusion head, S for temperature, If not sent Tnnn It is considered to be the operation of the extruder 0.
	M104 Tnnn Snnn
M105	Get the temperature status, B is the hot bed, T for the extruder, F is the fan, R is the printing rate, the front of the "/" is the current value, followed by the set value.
	M105 Return status: ok B:%.1f /%.1f T0:%.1f /%.1f T1:%.1f /%.1f T2:%.1f /%.1f F:%d R:%d @:0 B@:0\r\n wait.
M106	Set the fan speed, P is the fan number, and S is the fan speed percentage. If Tnnn is not sent, it is considered to be the fan 0 operation.
	M106 Pnnn Snnn
M107	Turn off the fan. If the M107 is sent separately, turn off the fan.
	M107 or M107 Pnnn
M109	Set the extrusion head temperature and wait for the temperature to set.
	M109 Tnnn Snnn
M110	Set the line number, set the current line number nnn, so that the next line

	corresponds to the line number nnn+1
	M110 Nnnn
M114	Query current x/y/z/e location.
	Return:X:nnn Y:nnn Z:nnn E:nnn\r\n
M115	Query current firmware version information.
	For example return: FIRMWARE_NAME: VERSION PROTOCOL_VERSION:V1.0 MACHINE_TYPE: MACHINE_TYPE EXTRUDER_COUNT:1 UUID: Setting.SN \r\n"
M117	Send print time information.
	Receiving format M117 ETEnnn or M117 ETE nnnh nnnm nnns
M119	Query limit switch status.
	For example return: X MIN Endstop:ON(OFF) X MAX Endstop:ON(OFF) Y MIN Endstop:ON(OFF) Y MAX Endstop:ON(OFF) Z MIN Endstop:ON(OFF) Z MAX Endstop:ON(OFF) or x_min:H y_min:H z_min:L or x_min:OPEN x_max: TRIGGERED y_min:OPEN y_max: TRIGGERED z_min: TRIGGERED z_max: OPEN
M140	Set the hot bed temperature.
	M140 Snnn
M190	Set the hot bed temperature and wait for the temperature to reach the set value.
	M190 Snnn
M163	Set a single proportion for a mixing extruder. *(Requires MIXING_EXTRUDER)*.
	M163 Snnn Pnnn
M164	Save the mix as a virtual extruder. *(Requires MIXING_EXTRUDER)*.
	M164 Snnn or M164
M165	Set the proportions for a mixing extruder. Use parameters ABCDHI to set the mixing factors. *(Requires MIXING_EXTRUDER)*.
	M165 Annn Bnnn Cnnn Dnnn Hnnn Innn
M201	Set max acceleration.
	M201 Xnnn Ynnn Znnn Ennn
M203	Set max feedrate (units/sec).
	M203 Xnnn Ynnn Znnn Ennn
M204	Set acceleration.
	M204 Pnnn Rnnn
M205	Set advanced settings. Current units apply: S<print> T<travel> minimum speeds

	B<minimum segment time> X<max X jerk>, Y<max Y jerk>, Z<max Z jerk>, E<max E jerk>
	M205 Xnnn Ynnn Znnn Ennn/M205 Snnn Tnnn Bnnn
M220	Set the current print speed override.
	M220 Snnn
M280	Set servo position absolute. P: servo index, S: angle or microseconds.
	M280 Pnnn Snnn
M300	Set the buzzer sound frequency and time, the function has been set, but not perfect.
	M300 Snnn Pnnn
M301	Set the PID parameters of the extrusion head, H is the extruder number.
	M301 Hnnn Pnnn Innn Dnnn
M304	Set the PID parameters of the hot bed.
	M304 Pnnn Innn Dnnn
M500	Save printer parameters to printer EEPROM or Flash.
	M500
M502	Reset *(Set default setting)*.
	M502
M665	set delta configurations L<diagonal_rod> R<delta_radius> S<segments_per_sec>
	M665 Lnnn Rnnn Snnn
M666	set delta endstop adjustemnt
	M666 Xnnn Ynnn Znnn
M851	Set Z probe's Z offset in current units. (Negative = below the nozzle.)
	M851 Znnn
M2000 (*)	Set the machine serial number SN=17SxxxxD200xxxx, Serial number is 16 characters.
	Sending format M2000 17SxxxxD200xxxx return: SN_set_ok\n
M2001 (*)	Earse whole flash. Function not programmed.
M2002 (*)	Read print setting Query the printer's XYZ axis maximum and minimum position, XYZE axis motor steps per mm, maximum feed speed, homing speed and home position, motor direction, and machine serial number.
	Return: min_position[X_AXIS]:%.2f;min_position[Y_AXIS]: %.2f;min_position[Z_AXIS]:%.2f;max_position[X_AXIS]: %.2f;max_position[Y_AXIS]:%.2f;max_position[Z_AXIS]:%.2f; steps_per_mm[X_AXIS]:%.2f;steps_per_mm[Y_AXIS]: %.2f;steps_per_mm[Z_AXIS]:%.2f;steps_per_mm[E_AXIS]:%.2f; max_feedrate[X_AXIS]:%d;max_feedrate[Y_AXIS]: %d;max_feedrate[Z_AXIS]:%d;max_feedrate[E_AXIS]:%d; home_speed[X_AXIS]:%d;home_speed[Y_AXIS]:

	%d;home_speed[Z_AXIS]:%d;home_position[X_AXIS]: %d;home_position[Y_AXIS]:%d;home_position[Z_AXIS]:%d; motor_direction[X_AXIS]:%d;motor_direction[Y_AXIS]: %d;motor_direction[Z_AXIS]:%d;motor_direction[E_AXIS]: %d;motor_direction[E1_AXIS]:%d;motor_direction[E2_AXIS]:%d; SN:%s;
M2003 (*)	Set max printing range. Set the printer's maximum print range and save to user settings.
	M2003 Xnnn Ynnn Znnn; return: max_position_set_ok\n
M2004 (*)	Set motor steps/mm. Set the number of motor steps per mm of the XYZE axis and save to the user settings.
	M2004 Xnnn Ynnn Znnn Ennn; return: steps_per_mm_set_ok\n
M2005 (*)	Set motor move direction. Set the direction of each axis motor, only 0 and 1 parameters in the direction, and save to factory settings.
	M2005 Xnnn Ynnn Znnn E0nnn E1nnn E2nnn return: motor_direction_set_ok\n
M2006 (*)	Set max feedrate. Set the maximum feed rate and save to factory settings.
	M2006 Xnnn Ynnn Znnn Ennn return: max_feedrate_set_ok\n
M2007 (*)	Set homing speed. Set the homing speed and save it to the factory settings.
	M2007 Xnnn Ynnn Znnn Ennn return: home_speed_set_ok\n
M2009 (*)	Set hardware_version. Set the hardware version number, the hardware version number is 6 characters.
	M2009 V1.01 wait. Return: HV_set_ok\n
M2100 (*)	LCD file transmission Use the firmware upgrade control command in the application, currently used on the LCD screen upgrade.
M2101 (*)	Printer state read Send printer status, there are currently five printer status, printer status followed by added motor unlock status, print file, path, print time percentage, consumable status, etc., currently used as app status command.
	printer_standby;... printer_printing;... printer_paused;... printer_finish;... printer_idle;...
M2102 (*)	The printer obtains the signal strength of the wifi module, which is an instruction sent from the wifi module.
	M2102 Snnn nnn for 0-5

M2103 (*)	Terminate SD card printing.
	M2103
M2104 (*)	Network disconnected, reconnect instruction.
	M2104 ESP8266 server disconnected
M2105 (*)	Extrusion head discharge and material return, S is the discharge direction, nnn has two opposite directions of 0 and 1, the preset feed and return material length is 3mm; S2 is the extruder always feeds, S3 is the extruder always withdraws Material, S4 stops feeding and returning.
	M2105 Snnn
M2106 (*)	Consumables detection switch control command, S has open: 1, off: 0 two states.
	M2106 Snnn
M2107 (*)	App/LCD with manual leveling command, S is custom leveling setting parameter.
	M2107 Snnn M2107 S0 Request homing and upload Z-axis location upload format M2107 Znnn M2107 S1(~S5) Move back to the first point to the fifth point, respectively, and return successfully. M2107 ok, Failure return: M2107 fail\n M2107 S6(~S7) Ascending (decreasing) Z axis 0.5mm M2107 S8 Save the Z axis parameters after leveling, return yes M2107 save succes
M2108 (*)	Set the motor unlock time in s. When S is less than 60, the default is 60s, which is not used at present.
	M2108 Snnn
M2109 (*)	The alive app re-logs to send a status request, and the status command contains M2101, M105, M115. Need wifi function support.
	Return M2101, M105, M115 command status to app in order.
M2110 (*)	Need wifi function support. Receive the file data packet sent by the server, the format is marked later, this instruction does not process the normal instruction.
M2111 (*)	App uses the motor to move the homing control command, S is the custom command state, and X/Y/Z contains the motor moving distance and direction.
	M2111 Snnn X/Y/Znnn S0: Motor enable. S1: Motor failure. S2: Relative movement X axis +/- nnn mm. S3: Relative movement Y axis +/- nnn mm. S4: Relative movement Z axis +/- nnn mm.

M2112 (*)	3DWIFI command: 3dwifi automatically obtains the printer parameters and uploads them to the app, Cx, Cy, Cz respectively for the homing direction of each axis, Lx, Ly, Lz are the printer printing range respectively; need corresponding command support (M26, M110 , M114, M119)
	M2112;Cx:nnn;Cy:nnn;Cz:nnn;Lx:nnn;Ly:nnn;Lz:nnn;\r\n
M2113 (*)	3DWIFI command: Set the USB baud rate of 3dwifi and save it to flash. This baud rate is the serial port baud rate of 3dwifi connected to the printer. The value of S followed by the baud rate can only be used 115200, 256000, 250000. Kind, the default is 256000
	M2113 Snnn
M2114 (*)	3DWIFI command: Set 3dwifi USB configuration parameters (SetLineCoding), test use 3dwifi and printer mismatch can be manually adjusted by configuration parameters.
	OPEN:nnn bm:nnn bR:nnn wV:nnn wI:nnn wL:nnn wL:nnn
M2115 (*)	Select the location to read the file. There are currently two types of U disk and SD card. When multiple drive letters can be read in the printer, the operation position must be selected before operation. Currently only SD cards are supported.
	M2115 Snnn S0: Select SD card. S1: Select U disk.
M2116 (*)	Polecenie 3Dwifi: dotyczy operacji 3dwifi, ustawienia szybkości transmisji modułu WiFi.
	SETBautRate:nnn\n
M2120 (*)	Automatic leveling control, the M2120 is sent with parameters: M2120 Pnnn Snn Currently used as an LCD screen operation command.
	The M2120 format is as follows: P0: Enable control S0 (automatic leveling disability) S1 (automatic leveling enable, upload Z offset value at this time L11 P0 Snnn nnn is Zoffset), P1: Servo control S0 (probe rise) S1 (probe down) S2 (release alarm), P2: Correction and save Z offset, P3: Z-axis increase. Snnn (move nnn mm, nnn can be negative) S0=10mm S1=1.0mm S2=0.1mm S3=0.05mm Need Z axis parameter upload (L1 Znnn), P4: The Z axis is lowered. Snnn (moving nnn mm, nnn can be negative) S0=10mm S1=1.0mm S2=0.1mm S3=0.05mm, Need Z axis parameter upload (L1 Znnn), P5: Request Zoffset value, return L11 P0 Snnn (nnn is -Zoffset), P6: Clear current Z-axis deviation; P7: Auto-leveling G28 homing and moving the extruder to the

	center； P9: Switch 3Dtouch and capacitive proximity switches.
M2121	LCD screen file transfer.
M2130 (*)	Continued control, the current M2130-M2140 as a touch screen control.
	The M2130 format is as follows: M2130 Pnnn Snnn Pnnn: parameter object, Snnn: parameter value, P0: Continue to resume recovery failure control refresh flag.
M2131 (*)	The printer comes with Wifi module control and wifi status upload.
	WT 代表 wifi 状态(0:close, 1:open)、CF 代表自动连接标志(0:close, 1:open)、AP 进入配置状态(0: 退出, (0: 进入)、 SS 服务器状态(0:close, 1:open,2:success)、RS wifi 信号强度(0 为无信号,1-5 为信号强度值, 五最强)、RE 路由器使能状态(0:close, 1:open,2:success)、RI 路由器 ip、RA 路由器名称 SA 服务器地址或名字； WT stands for wifi status (0:close, 1:open), CF stands for automatic connection flag (0:close, 1:open), AP enters configuration state (0: exit, (0: enter), SS server status (0:close, 1:open,2:success), RS wifi signal strength (0 is no signal, 1-5 is signal strength value, five strongest), RE router enable state (0:close, 1:open,2:success), RI router ip, RA router name SA server address or name; When the command M2131 \r\n has no parameters, the status information is returned: L4 WT:nnn CF:nnn AP:nnn SS:nnn RE:nnn RI:routerip: RA:ssid SA:serverip:\r\n Instruction M2131 Pnnn Snnn\r\n Snnn represents the parameter P0 WT stands for wifi status (S0:close, S1:open), P1 CF stands for automatic connection sign (S0:close, S1:open), P2 The AP enters the configuration state (S0: Exit, S1: Enter).
M2132 (*)	The LCD is about controlling the Steppercontrol (servo motor control board) command.
	The M2132 format is as follows: M2132 Pnnn Snnn P0 Snnn: Turns the custom servo control mode on and off. P1: calibrate correction encoder, no parameters. P2: testcal test calibration, the motor will rotate one turn for test calibration, return the maximum error angle value, no parameters.

	P3 Snnn: microsteps Gets or sets the value of the microstep subdivision of the stepper motor driver, P4: readpos reads the current 16-bit data angle value, P5 Snnn: spid query/set Kp, Ki, and Kd—for the `simple location PID` controller, P6: dirpin query / set dir pin direction, P7: The error error maximum error that can be accepted by errorlimit is output to the error pin when the error pin is set to the error output. Errorlimit 1.8 Set the error limit to 1.8 degrees, P8: maxcurrent. This will set the maximum current for the drive motor, P9: holdcurrent For simple position PID mode, the minimum current (ie, the current without position error) is the holding current, P10: factoryreset will erase calibration and other system and motor parameters to reset the device to its factory state. After this command, the unit will need to be calibrated to the motor again, P11:setzero This command will get the current motor position and set it to an absolute zero angle. Note that if you move in the middle, it will take the position of the command and use it, so it is recommended to stop moving or wait for completion before issuing setzero. Return to save the value successfully interface prompt is not added;
M2133 (*)	Abnormal situation LCD interface switching command, function is not used.
M2134 (*)	LCD version number and so on to the motherboard.
	M2133 Format is as follows: M2133 XX:nnn YY:nnn ZZ:nnn XX, YY, ZZ: Parameter object. nnn: Parameter value, which can be a number or a string M2133 FW:nnn version number nnn Downstream
M2135 (*)	Set the fixed mix ratio.
	M2135 Pnnn Snnn P: Extruder selection, S: Ratio corresponding to the mixing extruder, mixing extruder, and the proportion of all 100.
M2136 (*)	Mixing function: mixing ratio set template.
	M2136 Snnn S: Select the template number.
M2137 (*)	Mixing function: set the gradient mixing ratio of the specified height.
	M2137 Annn Bnnn Cnnn Dnnn A- T0 Mix percentage at start, B- T0 Mix percentage at the end, C- High mixing layer at the beginning,

	D- High mixing layer at the end.
M2138 (*)	Mixing function: select the mixing mode switch.
	M2138 Snnn S0: All modes are switched off. S1: Select a fixed mixing ratio. S2: Select a mix proportional to the template. S3: Specified mixing height.
M 2202 (*)	Did not understand why you want to add this, first reserve.

M (*)	
M (*)	

4、 **T** Command parsing

instruction	**Description**
T0~T16	Instructions for the mixing, the mixing ratio selection extruder of T0 ~ T16.

5、 **M** instructions not included in the printer's instruction set.

M2110(*)	App file transfer instruction.
	M2110 start: File transfer start command return: Return when the SD card status is not ready: SD: fail\r\n File transfer is ready to return: M2110 start\r\n M2110 Continue: File transfer continue command return: M2110 ContinueStart\r\n M2110 send end: File transfer pause command return: M2110 send completion\r\n; And execute the refresh file list and select the file M23 to start printing the M24 command. M2110 send stop: File transfer paused return: M2110 send stop\r\n M2110 SD0 file name; file offset address; file length; binary file data; parity bit\n: file packet transmission Returns: packet transfer success return: M2110 file offset ok\r\n Packet transmission failure returned: M2110 file offset fail\r\n Packet verification failed. Return: M2110 file offset fail SD: 0\r\n 10 consecutive verification failures returned: M2110 file offset fail

	SD: Err\r\n Packet transmission timeout returns: M2110 %d fail 4\r\n Returned after 7 consecutive packet transmission timeouts: M2110 send stop\r\n with M2110 %d fail SD:Err\r\n