



RoboMicro Command List

Command List Overview

The RoboMicro command set has been designed to allow control of all RoboMicro functions from a Master Controller connected to RoboMicro via the RS232 interface.

It is the job of the Master Controller to provide intelligent control of the RoboMicro system, via software. It is the function of RoboMicro to provide the hardware interface/layer.

This arrangement of Master (software) and RoboMicro (Hardware) allows the user to connect and control most of the commonly used hardware components in automation and robotics. The user can spend time developing the application and not waste time re-inventing how to drive a Stepper motor, RC Servo, etc

The design of RoboMicro is to remove the "pain" from connecting and controlling the commonly used sensors and actuators in robotics, and provide the user with a simple yet powerful command set to control the attached hardware. The command set can be broken down into three different areas of commands;

System & Configuration Commands

These commands allow the user to configure various settings within RoboMicro. All configuration and setting changes can be made at anytime. There is no need for the user to "move-a-link" or "hold switch A when powering up.." to place RoboMicro in configuration mode.

RoboMicro system configuration settings are "remembered" between power-ups, so the user should normally only need to configure RoboMicro once. In case of an error being detected with the configuration settings, the user can force a "Return To Factory Default" setting – by moving the Reset Link from Normal to Reset position and back again.

Control Commands

These commands allow the user to request information or driver hardware connected to RoboMicro, and any sensor/hardware connected to RoboMicro. This information could be anything from driving a stepper motor to a new position to reading

the analogue voltage currently being applied to one of the analogue I/P's.

Advanced Commands

A lot of commonly used sensors and hardware used in Robotics and automation communicate using a serial bus (I2C, 1-wire, RS232, etc). The RoboMicro OS contains the require drivers to control these buses and commonly used sensors. However, we understand that a user may wish to add sensors and hardware to one of these buses, where RoboMicro does not directly contain the driver to control this new sensor. To help the user achieve control of these new sensors, all the low-level bus commands are made available.

Other Built In Commands

RoboMicro Firmware will control other RoboMicro products automatically. The following is a list of Current & Planned RoboMicro products and modules

RoboTock (RTC Commands): *These commands are available, together with supported hardware.*

RoboEye (Camera Commands): *These commands will be available at a later date. Together with supported hardware. Please check website for details of availability*

RoboGPS (GPS Commands): *These commands will be available at a later date. Together with supported hardware. Please check website for details of availability*

RoboVoice (Voice Synth Commands): *These commands will be available at a later date. Together with supported hardware. Please check website for details of availability*

RoboBus (Digital Expansion Bus): *These commands will be available at a later date. Together with supported hardware. Please check website for details of availability*

RoboMicro Complete Command List

System Commands

- 1.1 Factory Default/Reset
- 1.2 Read RS232 Baud Rate
- 1.3 Set RS232 Baud Rate
- 1.4 Write User ID (Line 1 & 2)

Analogue Input Commands

- 2.1 Read Analogue Input Value
- 2.2 Report Analogue Input Format Setting
- 2.3 Set Analogue Input Format Setting

Digital Input Commands

- 3.1 Read Digital Input Value
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Digital Output Commands

- 4.1 Read Digital Output Value
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Stepper Motor Commands

- 5.1 Read Stepper Motor Status
- 5.2 Read Total Number of Steps Per Rotation
- 5.3 Read Virtual Shaft Position
- 5.4 Read Stepper Motor Step Speed
- 5.5 Read Stepper Motor Acceleration/Deceleration Ramp Speed
- 5.6 Rotate Stepper Motor
- 5.7 Stop Stepper Motor
- 5.8 Set Stepper Motor Step Speed
- 5.9 Set Stepper Motor Acceleration/Deceleration Ramp Speed
- 5.10 Set Total Number of Steps Per Rotation
- 5.11 Set Virtual Shaft Position

RC Servo Motor Commands

- 6.1 Enable/Disable RC Servo Motor Driver
- 6.2 Read Enabled/Disabled Status of RC Servo Motor Driver
- 6.3 Move RC Servo Motor to Position
- 6.4 Read RC Servo Motor Position

SRF08 Ultrasonic Range Finder Commands

- 7.1 Mount SRF08 Sensor into Sensor Net
- 7.2 Un-Mount SRF08 Sensor from Sensor Net
- 7.3 Set Unit of Distance used by SRF08
- 7.4 Report Unit of Distance used by SRF08

- 7.5 Scan I2C Bus for SRF08 sensors
- 7.6 Request All SRF08 sensors carry out distance measurement
- 7.7 Read distance measurement from SRF08
- 7.8 Request SRF08 carry out distance measurement and report distance
- 7.9 Set SRF08 Ping Range
- 7.10 Set SRF08 Ping Gain
- 7.11 Read LDR (Light Sensor) on SRF08

Real Time Clock Module Commands (RoboTock)

- 8.1 Set Time of RTC Module (RoboTock)
- 8.2 Set Date of RTC Module (RoboTock)
- 8.3 Read Time from RTC Module (RoboTock)
- 8.4 Read Date from RTC Module (RoboTock)

DS18B20 Temperature Sensor Commands

- 9.1 Mount DS18B20 Sensor in Temperature Sensor Net
- 9.2 Un-Mount DS18B20 Sensor in Temperature Sensor Net
- 9.3 Report DS18B20 ID stored in Temperature Sensor Net location
- 9.4 Read DS18B20 Temperature value

I2C Bus Commands

- 10.1 Enable/Disable I2C Bus Driver
- 10.2 Report I2C Bus Driver Status
- 10.3 Check I2C Bus Idle Status
- 10.4 I2C Bus Start Request
- 10.5 I2C Bus Stop Request
- 10.6 Write Byte on I2C Bus
- 10.7 Read Byte from I2C Bus +Ack
- 10.8 Read Byte from I2C Bus + No Ack

1-Wire Bus Commands

- 11.1 Enable/Disable 1-Wire Bus Driver
- 11.2 Report 1-Wire Bus Driver Status
- 11.3 Check 1-Wire Bus Idle Status
- 11.4 Write Byte on 1-Wire Bus
- 11.5 Read Byte from 1-Wire Bus

Ref: 1.1
Command Set: System Setting & Configuration
Command Name: Factory Default/Reset
Command Format: (SSRESET)
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command causes RoboMicro to reset all configuration and settings to factory defaults. RoboMicro will take about 3 to 5 seconds to carry out this command. During this time RoboMicro OS will not be available to receive other commands Examples: Example 1: Reset RoboMicro to factory defaults Command: (SSRESET) Response: (ACK)

Ref: 1.2
Command Set: System Setting & Configuration
Command Name: Read RS232 Baud Rate Setting
Command Format: (SRBR)
RoboMicro Response: (SRBRn) or (NAK) <i>Where n is Baud Rate code</i> <i>1 = 9600 Baud (Default Setting)</i> <i>2 = 19200 Baud</i> <i>3 = 38400 Baud</i> <i>4 = 57600 Baud</i> <i>5 = 115200 Baud</i> <i>6 = 230400 Baud</i>
Functional Description: This command allows the user to read the RS232 baud rate used by RoboMicro Example Commands Example 1: Read RoboMicro Baud Rate. RoboMicro is configured to use 57600 Baud arte Command: (SRBR) Response: (SRBR4) Example 2: Read RoboMicro Baud Rate. RoboMicro is configured to use 9600 Baud arte Command: (SRBR) Response: (SRBR1)

Ref: 1.3
Command Set: System Setting & Configuration
Command Name: Set RS232 Baud Rate Setting
Command Format: (SSBRx) <i>Where;</i> <i>x = Baud Rate</i> <i>1 = 9600 Baud (Default Setting)</i> <i>2 = 19200 Baud</i> <i>3 = 38400 Baud</i> <i>4 = 57600 Baud</i> <i>5 = 115200 Baud</i> <i>6 = 230400 Baud</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command allows the user to change the RS232 baud rate used by RoboMicro. Example Commands Example 1: Set RoboMicro baud rate to 115200 Command: (SSBR5) Response: (ACK) Example 2: Set RoboMicro baud rate to 38400 Command: (SSBR3) Response: (ACK) Example3: Set RoboMicro to invalid baud rate Command: (SSBR0) Response: (NAK)

Ref: 1.4
Command Set: System Setting & Configuration
Command Name: Set User ID
Command Format: (SSVxnnnnnnnn) <i>where;</i> <i>x: ID Line Number (1=Line 1, 2=Line 2)</i> <i>nnnnnnnn: 8 bytes of data.</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command allows the user to write 8 chars of data into line 1 of the RoboMicro ID. This information is not directly used by RoboMicro, but is provided to the user to allow each RoboMicro to be given a unique "Identifier". This information could be a serial number, date, etc Example Commands Example 1: Set RoboMicro Line 2 ID to "Robot_V1" Command: (SSV2Robo_V1) Response: (ACK) Example 2: Set RoboMicro Line 1 ID to "ArmCtrl2" Command: (SSV1ArmCtrl2) Response: (ACK)

Ref: 2.1
Command Set: Analogue Input Commands
Command Name: Read Analogue Input
Command Format: (RAx) <i>Where x is the analogue input number (1,2,3 or 4)</i>
RoboMicro Response: (RAxnnnn), (RAv.vvvV) or (NAK) <i>Where x is the analogue input number (1,2,3 or 4)</i> <i>Where nnnn is a numeric value 0 to 1023</i> <i>Where v.vvv is a voltage value 0.000 to 5.000</i>
Functional Description: This command allows the user read a signal applied to one for the four analogue inputs. The format of the returned data can be numeric (ADC) or voltage (n.nnnV).
Example Commands
Example 1: Read Analogue Input 1. Numeric reporting Command: (RA1) Response: (RA10341)
Example 2: Read Analogue Input 2. Voltage reporting Command: (RA2) Response: (RA23.456V)

Ref: 2.2
Command Set: Analogue Input Commands
Command Name: Read Analogue Signal Report Format
Command Format: (SRAx) <i>Where x is the analogue input number (1,2,3 or 4)</i>
RoboMicro Response: (SRAxn) or (NAK) <i>Where x is the analogue input number (1,2,3 or 4)</i> <i>Where n is the format type (N=Numeric, V=Voltage)</i>
Functional Description: This command returns formatting setting of the analogue input.
Example Commands
Example 1: Read Analogue Input 1 formatting. Command: (SRA1) Response: (SRA1V)
Example 2: Read Analogue Input 2 formatting. Command: (SRA2) Response: (SRA2N)

Ref: 2.3
Command Set: Analogue Input Commands
Command Name: Set Analogue Signal Report Format
Command Format: (SSAxn) <i>Where x is the analogue input number (1,2,3 or 4)</i> <i>Where n is the format type (N=Numeric, V=Voltage)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets formatting applied to analogue input value. Example 1: Set Analogue Input 1 to Voltage format Command: (SSA1V) Response: (ACK) Example 2: Set Analogue Input 3 to Numeric format Command: (SSA3N) Response: (ACK) Example 3: Set Analogue Input 5 to Voltage format (error) Command: (SSA5V) Response: (NAK)

Ref: 3.1
Command Set: Digital Input Commands
Command Name: Read Digital Input
Command Format: (RIx) <i>Where x is the digital input number (1,2,3, 4 or A)</i>
RoboMicro Response: (RIxn), (RIxabcd) or (NAK) <i>Where x is the Digital input number</i> <i>Where a is Digital input 1 value</i> <i>Where b is Digital input 2 value</i> <i>Where c is Digital input 3 value</i> <i>Where d is Digital input 4 value</i> <i>Where n is Digital input value (0 or 1)</i>
Functional Description: This command reads the signal applied to the indicated digital input. It is also possible to get RoboMicro to report all digital input values by using A in place of the digital input number. Example 1: Read Digital Input 3 Command: (RI3) Response: (RI31) Example 2: Read Digital Input 1 Command: (RI1) Response: (RI10) Example 3: Read All Digital Inputs Command: (RIA) Response: (RIA0010)

Ref: 3.2
Command Set: Digital Input Commands
Command Name: Read Digital Pulse Count Value
Command Format: (RCx) <i>Where x is the digital pulse count number (1,2,3, 4)</i>
RoboMicro Response: (RCxn), (RCxnnnnn) or (NAK) <i>Where x is the analogue input number (1,2,3 or 4)</i> <i>Where nnnnn is a numeric value 0 to 2000</i>
Functional Description: This command reads the digital pulse count signal applied to the indicated digital input. Example 1: Read Digital Input 3 Pulse count value Command: (RC3) Response: (RC301234) Example 2: Read Digital Input 1 Pulse count value Command: (RC1) Response: (RC10094)

Ref: 4.1
Command Set: Digital Output Commands
Command Name: Read Digital Output
Command Format:
(ROx) <i>Where x is the digital output number (1,2,3, 4 or A)</i>
RoboMicro Response:
(ROxn), (ROxabcd) or (NAK) <i>Where x is the digital output number Where a is Digital output 1 value Where b is Digital output 2 value Where c is Digital output 3 value Where d is Digital output 4 value Where n is Digital output value (0 or 1)</i>
Functional Description: This command reads the current setting of the indicated digital output. It is also possible to get RoboMicro to report all digital output values by using A in place of the digital output number.
Example 1: Read Digital output 3 Command: (R03) Response: (R031)
Example 2: Read Digital output 1 Command: (R01) Response: (R010)
Example 3: Read All Digital output Command: (ROA) Response: (ROA0010)

Ref: 4.2
Command Set: Digital Output Commands
Command Name: Write Digital Output
Command Format:
(WOxn) <i>Where x is the digital output number (1,2,3, 4 or A) Where n is Digital output value (0 or 1)</i>
RoboMicro Response:
(ROxn) or (NAK) <i>Where x is the digital output number Where a is Digital output 1 value Where b is Digital output 2 value Where c is Digital output 3 value Where d is Digital output 4 value Where n is Digital output value (0 or 1)</i>
Functional Description: This command writes the supplied value to the indicated digital output. RoboMicro will respond with the new value of the digital output.
Example 1: Set digital output 1 on Command: (WO11) Response: (RO11)
Example 2: Set digital output 2 off Command: (WO20) Response: (RO20)

Ref: 5.1
Command Set: Stepper Motor Commands
Command Name: Read Stepper Motor Status
Command Format:
(RMxS) <i>Where x is the stepper motor number (1,2,3 or 4)</i>
RoboMicro Response:
(RMxnndddd) or (NAK) <i>Where x is the stepper motor number Where n is direction of the stepper motor (F=Forward, R=Reverse, S=Stopped) Where dddd is the number of steps left to run until the stepper motor reaches the required position.</i>
Functional Description: This command reports the current active status of the stepper motor.
Example 1: Read Stepper Motor 1 Status Command: (RM1S) Response: (RM1S0000)
Example 2: Read Stepper Motor 3 Status Command: (RM3S) Response: (RM3F02351)
Example 3: Read Stepper Motor 2 Status Command: (RM2S) Response: (RM3R10001)

Ref: 5.2
Command Set: Stepper Motor Commands
Command Name: Read Total Steps Per Rotation
Command Format:
(RMxR) <i>Where x is the stepper motor number (1,2,3 or 4)</i>
RoboMicro Response:
(RMxRdddd) or (NAK) <i>Where x is the stepper motor number Where dddd is the total number of steps for one complete rotation of the stepper motor.</i>
Functional Description: This command reports the total number of steps required for the stepper motor to make one complete rotation. The main use of this parameter is to allow RoboMicro to track the Final Driver Output Shaft Position in the case of geared stepper motors. This allows the user to use the final shaft position in the application – without the need for complex math functions to keep track of the shaft position within the application
Eg: Assume Total Steps Parameter is set to 1000. If Motor Shaft Position reports 0000 – this represents a shaft position of 12 o'clock If Motor Shaft Position reports 0250 – this represents a shaft position of 3 o'clock If Motor Shaft Position reports 0750 – this represents a shaft position of 9 o'clock
Example 1: Read Stepper Motor 1 Total Rotation count Command: (RM1R) Response: (RM1R00100)
Example 2: Read Stepper Motor 2 Total Rotation count Command: (RM3R) Response: (RM3R25000)

Ref: 5.3
Command Set: Stepper Motor Commands
Command Name: Read Stepper Motor Virtual Shaft Position
Command Format: (RMxP) <i>Where x is the stepper motor number (1,2,3 or 4)</i>
RoboMicro Response: (RMxPdddd) or (NAK) <i>Where x is the stepper motor number</i> <i>Where dddd is the rotational position of the virtual shaft of the stepper motor.</i>
Functional Description: This command reports the virtual shaft position of the stepper motor. This value works with the Total Steps Parameter to locate the stepper motor shaft within the "Total Steps Parameter". Eg: Assume Total Steps Parameter is set to 1000. If Motor Shaft Position reports 0000 – this represents a shaft position of 12 o'clock If Motor Shaft Position reports 0250 – this represents a shaft position of 3 o'clock If Motor Shaft Position reports 0750 – this represents a shaft position of 9 o'clock The main use of this parameter is to allow RoboMicro track the Final Driver Output Shaft Position in the case of geared stepper motors. This allows the user to use the final shaft position in the application – without the need for complex math functions to keep track of the shaft position within the application Example 1: Read Stepper Motor 1 Shaft position Command: (RM1P) Response: (RM1P00012)

Ref: 5.4
Command Set: Stepper Motor Commands
Command Name: Read Stepper Motor Step Speed
Command Format: (SRMxS) <i>Where x is the stepper motor number (1,2,3 or 4)</i>
RoboMicro Response: (SRMxSdddd) or (NAK) <i>Where x is the stepper motor number</i> <i>Where dddd is the number of steps per second or speed of the stepper motor</i>
Functional Description: This command reports the number of steps per second the stepper motor driver will operate at. This figure is the "ideal" speed required. However, the acceleration ramps will modify the final step speed to get the best overall performance from the stepper motor driver with the selected ramp setting Example 1: Read Stepper Motor 1 Step Speed Command: (SRM1S) Response: (SRM1S00200)

Ref: 5.5
Command Set: Stepper Motor Commands
Command Name: Read Stepper Acceleration/Deceleration Ramp
Command Format: (SRMxA) <i>Where x is the stepper motor number (1,2,3 or 4)</i>
RoboMicro Response: (SRMxSdddd) or (NAK) <i>Where x is the stepper motor number</i> <i>Where dddd is the acceleration and deceleration ramp setting.</i>
Functional Description: This command reports the slow of the acceleration and deceleration ramps of the stepper motor driver. A value of 1 gives a very slow acceleration and deceleration of the stepper motor A value of 10 gives a very fast acceleration and deceleration of the stepper motor Example Commands Example 1: Read Stepper Motor 1 ramps Command: (SRM1A) Response: (SRM1A00005) Example 2: Read Stepper Motor 2 ramps Command: (SRM2A) Response: (SRM2A00010)

Ref: 5.6
Command Set: Stepper Motor Commands
Command Name: Rotate Stepper Motor
Command Format: (WMxdnnnnn) <i>Where x is the stepper motor number (1,2,3 or 4)</i> <i>Where d is the required direction (F=Forward, R=Reverse)</i> <i>Where nnnnn is the number of steps required</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command causes RoboMicro to rotate the indicated stepper motor the required number of steps in the direction stated. Example Commands Example 1: Rotate stepper motor 1 forward 254 steps Command: (WM1F254) Response: (ACK) Example 2: Rotate stepper motor 4 backwards 1000 steps Command: (WM1R1000) Response: (ACK)

Ref: 5.7
Command Set: Stepper Motor Commands
Command Name: Stop Stepper Motor Rotation
Command Format: (WMxS) <i>Where x is the stepper motor number (1,2,3 or 4)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command caused RoboMicro to stop the rotation of a stepper motor. Example Commands Example 1: Stop stepper motor 2 Command: (WM2S) Response: (ACK) Example 2: Stop Stepper Motor 3 Command: (WM3S) Response: (ACK)

Ref: 5.8
Command Set: Stepper Motor Commands
Command Name: Set Stepper Motor Step Speed
Command Format: (SSMxSnnnn) <i>Where x is the stepper motor number (1,2,3 or 4)</i> <i>Where nnnn is the stepper motor step speed required</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the step speed of the indicated stepper motor Example Commands Example 1: Set stepper motor 4 step speed to 50 Command: (SSM4S50) Response: (ACK) Example 2: Set stepper motor 2 step speed to 600 Command: (SSM2S600) Response: (ACK)

Ref: 5.9
Command Set: Stepper Motor Commands
Command Name: Set Stepper Acceleration/Deceleration Ramp
Command Format: (SSMxAAnnn) <i>Where x is the stepper motor number (1,2,3 or 4)</i> <i>Where nnnn is the stepper motor ramp slope required</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the acceleration/deceleration ramp slope Example Commands Example 1: Set stepper motor 1 accl/decl ramp to 5 Command: (SSM1A5) Response: (ACK) Example 2: Set stepper motor 3 accl/decl ramp to 1 Command: (SSM3A1) Response: (ACK)

Ref: 5.10
Command Set: Stepper Motor Commands
Command Name: Set Stepper Motor Total Steps Per Rotation
Command Format: (SSMxRnnnnn) <i>Where x is the stepper motor number (1,2,3 or 4)</i> <i>Where nnnnn is the stepper motor total rotation step value</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the total steps per rotation parameter. Example Commands Example 1: Set stepper motor 1 steps per rotation to 3000 Command: (SSM1R3000) Response: (ACK) Example 2: Set stepper motor 2 steps per rotation to 400 Command: (SSM3R400) Response: (ACK)

Ref: 5.11
Command Set: Stepper Motor Commands
Command Name: Set Stepper Motor Virtual Shaft Position
Command Format: (SSMxPnnnnn) <i>Where x is the stepper motor number (1,2,3 or 4)</i> <i>Where nnnnn is the stepper motor virtual shaft position</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the total steps per rotation parameter. Example Commands Example 1: Set stepper motor 1 virtual shaft position to 122 Command: (SSM1P122) Response: (ACK) Example 2: Set stepper motor 2 virtual shaft position to 0 Command: (SSM2P0) Response: (ACK)

Ref: 6.1
Command Set: RC Servo Motor Commands
Command Name: Enable/Disable RC Servo Driver
Command Format: (SSSxn) <i>Where x is the RC Servo motor number (1,2,3 or 4)</i> <i>Where n enables or disabled servo driver (0=Disable, 1=Enable)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command enables or disables the identified RC servo driver. Example Commands Example 1: Enable Servo Driver 1 Command: (SSS11) Response: (ACK) Example 2: Disable Servo Driver 3 Command: (SSS30) Response: (ACK)

Ref: 6.2
Command Set: RC Servo Motor Commands
Command Name: Read RC Servo Driver Status
Command Format: (SRSx) <i>Where x is the RC Servo motor number (1,2,3 or 4)</i>
RoboMicro Response: (SRSxn) or (NAK) <i>Where x is the RC Servo motor number (1,2,3 or 4)</i> <i>Where n is enabled status of the servo driver (0=Disabled, 1=Enabled)</i>
Functional Description: This command returns the enabled/disabled status of the identified servo driver Example Commands Example 1: Get Servo driver 1 status Command: (SRS1) Response: (SRS11) Example 2: Get Servo driver 2 status Command: (SRS2) Response: (SRS20)

Ref: 6.3
Command Set: RC Servo Motor Commands
Command Name: Move RC Servo Motor Position
Command Format: (WSxnnn) <i>Where x is the RC Servo motor number (1,2,3 or 4)</i> <i>Where nnn is the RC Servo Pulse width (1 to 255)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command moves the indicated servo to the new position supplied Position values of 1 to 255, these correspond to a pulse width value of 0.01msec to 2.55msec. Note, most RC servos require a pulse width of 0.2msec to 2.2msec to give full rotation of the actuator. Example Commands Example 1: Move servo 1 fully anti-clockwise Command: (WS1220) Response: (ACK) Example 2: Move servo 3 fully clockwise Command: (WS320) Response: (ACK)

Ref: 6.4
Command Set: RC Servo Motor Commands
Command Name: Read RC Servo Motor Position
Command Format: (RSx) <i>Where x is the RC Servo motor number (1,2,3 or 4)</i>
RoboMicro Response: (RSxnnn) or (NAK) <i>Where x is the RC Servo motor number (1,2,3 or 4)</i> <i>Where nnn is the RC Servo Pulse width (1 to 255)</i>
Functional Description: This command returns the indicated servo position Position values of 1 to 255, these correspond to a pulse width value of 0.01msec to 2.55msec. Note, most RC servos require a pulse width of 0.2msec to 2.2msec to give full rotation of the actuator. Example Commands Example 1: Read servo 1 position Command: (RS1) Response: (RS1220) Example 2: Read servo 3 position Command: (RS3) Response: (RS320)

Ref: 7.1
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Mount SRF08 Ultrasonic Module into Sensor Network
Command Format: (SSUMx) <i>Where x is the Sensor net location where the SRF08 will be located (1 to 15)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command changes the default ID of the SRF08 to that of the Sensor net location (ID). There are 15 possible sensor net locations (ID's) that can be used. NB! The SRF08 ID can be returned to default ID by using the Un-Mount command. <i>(As the SRF08 is an I2C Bus device, please refer to I2C specification for detail on how to use I2C bus devices.)</i> Example Commands Example 1: Set SRF08 default ID to sensor net location 10 Command: (SSUM10) Response: (ACK) Example 2: Set SRF08 default ID to sensor net location 3 Command: (SSUM3) Response: (ACK)

Ref: 7.2
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Un-Mount SRF08 Ultrasonic Module into Sensor Network
Command Format: (SSUUx) <i>Where x is the Sensor net location of the SRF08 to be returned to default ID</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command changes the "mounted" ID of an SRF08 back to the default ID of the SRF08. There are 15 possible sensor net locations (ID's) that can be used. <i>(As the SRF08 is an I2C Bus device, please refer to I2C specification for detail on how to use I2C bus devices.)</i> Example Commands Example 1: Un-mount SRF08 at location 10 back to default ID Command: (SSUU10) Response: (ACK) Example 2: Un-mount SRF08 at location 3 back to default ID Command: (SSUM3) Response: (ACK)

Ref: 7.3
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Set SRF08 Unit Of Distance
Command Format: (SSUDx) <i>Where x is the unit of distance (I=Inches, C=Centimetres, U=Microseconds)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the unit of distance used by the SRF08. There are three possible unit of distances used; I = Inches C = Centimetres U = Microseconds <i>(As the SRF08 is an I2C Bus device, please refer to I2C specification for detail on how to use I2C bus devices.)</i> Example Commands Example 1: Set SRF08 unit of distance to Inches Command: (SSUDI) Response: (ACK) Example 2: Set SRF08 unit of distance to Microseconds Command: (SSUDU) Response: (ACK)

Ref: 7.4
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Read SRF08 Unit Of Distance
Command Format:
(RUD)
RoboMicro Response:
(RUDx) or (NAK)
<i>Where x is the unit of distance (I=Inches, C=Centimetres, U=Microseconds)</i>
Functional Description: This command reports the unit of distance used by the SRF08. There are three possible unit of distances used; I = Inches C = Centimetres U = Microseconds <i>(As the SRF08 is an I2C Bus device, please refer to I2C specification for detail on how to use I2C bus devices.)</i>
Example 1: Read SRF08 unit of distance Command: (RUD) Response: (RUDI)
Example 2: Read SRF08 unit of distance Command: (RUD) Response: (RUDC)

Ref: 7.5
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Scan I2C Bus for attached SRF08 modules
Command Format:
(RUA)
RoboMicro Response:
(RUAabcdefghijklmnop) or (NAK)
<i>Where a is default ID Where b is Sensor Net Location 1 Where c is Sensor Net Location 2 Where d is Sensor Net Location 3 Where e is Sensor Net Location 4 Where f is Sensor Net Location 5 Where g is Sensor Net Location 6 Where h is Sensor Net Location 7 Where i is Sensor Net Location 8 Where j is Sensor Net Location 9 Where k is Sensor Net Location 10 Where l is Sensor Net Location 11 Where m is Sensor Net Location 12 Where n is Sensor Net Location 13 Where o is Sensor Net Location 14 Where p is Sensor Net Location 15 Where 1 is sensor detected in location Where 0 is no sensor detected in location</i>
Functional Description: This command scans the I2C Bus and reports all SRF08 sensors that are responding. A value of 1 in that sensor ID location means that a sensor has been found and responded correctly while a value of 0 means that no sensor was detected in that location (with that ID)
Example 1: Get All SRF08 responding Command: (RUA) Response: (RUA1001000000000001)

Ref: 7.6
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Ping all attached SRF08 modules
Command Format: (WUP)
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command causes all responding SRF08 sensors to carry out a distance measurement and conversion Example Commands Example 1: Ping all sensors Command: (WUP) Response: (ACK)

Ref: 7.7
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Read distance from attached SRF08 module
Command Format: (RUSx) <i>Where x is the Sensor net location of the SRF08</i>
RoboMicro Response: (RUSxxxxnn) or (NAK) <i>Where x is the Sensor net location of the SRF08 to be returned to default ID</i> <i>Where nnnnn is the measured distance (in Inches, Centimetres or Microseconds)</i>
Functional Description: This command reads the last converted distance measurement from the indicated SRF008 module Example Commands Example 1: Read distance from sensor net location 12 Command: (RUS12) Response: (RUS1200321)

Ref: 7.8
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Ping &Read distance from attached SRF08 module
Command Format: (WUSx) <i>Where x is the Sensor net location of the SRF08</i>
RoboMicro Response: (RUSxxxxnn) or (NAK) <i>Where x is the Sensor net location of the SRF08 to be returned to default ID Where nnnnn is the measured distance (in Inches, Centimetres or Microseconds)</i>
Functional Description: This command causes the indicated SRF08 module to carry out a distance measurement and conversion. This new distance measurement is then returned Example Commands Example 1: Ping & Read distance from sensor net location 12 Command: (WUS12) Response: (RUS1200321)

Ref: 7.9
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Set SRF08 Ping Range
Command Format: (SSURxxnnn) <i>Where xx is the Sensor net location of the SRF08 Where nnn is the Ping Range (0-255) (See SRF08 datasheet for details of function)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the Ping Range of the indicated SRF08 module. See SRF08 datasheet for full details of this function Example Commands Example 1: Set Ping Range of Sensor SRF08 in location 12 to 20 Command: (SSUR12020) Response: (ACK)

Ref: 7.10
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Set SRF08 Ping Gain
Command Format: (SSURxxnnn) <i>Where xx is the Sensor net location of the SRF08</i> <i>Where nnn is the Ping Gain (0-31) (See SRF08 datasheet for details of function)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the Ping Gain of the indicated SRF08 module. See SRF08 datasheet for full details of this function Example Commands Example 1: Set Ping Gain of Sensor SRF08 in location 14 to 12 Command: (SSUR14012) Response: (ACK)

Ref: 7.11
Command Set: Ultrasonic SRF08 Range Sensor Commands
Command Name: Read Value of LDR on SRF08
Command Format: (RULxx) <i>Where xx is the Sensor net location of the SRF08</i>
RoboMicro Response: (RULxxnnn) or (NAK) <i>Where xx is the Sensor net location of the SRF08</i> <i>Where nnn is the value read from the LDR on the SRF08 module</i>
Functional Description: This command read the value of the LDR attached to the indicated SRF08 module. A low value means not much light, A high value means lots of light Example Commands Example 1: Read LDR value on SRF08 in location 11 Command: (RUL11) Response: (RUL11124)

Ref: 8.1
Command Set: Real Time Clock Module Commands (RoboTock)
Command Name: Set Time on RoboTock
Command Format: (SSDThhmmss) <i>Where hh is the Hours value (00 to 23)</i> <i>Where mm is the Minutes value (00 to 59)</i> <i>Where ss is the Seconds value (00 to 59)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the time in an attached RoboTock module. Example Commands Example 1: Set RoboTock to 18:34:12 Command: (SSDT183412) Response: (ACK) Example 2: Set RoboTock to 09:00:00 Command: (SSDT090000) Response: (ACK)

Ref: 8.2
Command Set: Real Time Clock Module Commands (RoboTock)
Command Name: Set Date on RoboTock
Command Format: (SSDDddmmyy) <i>Where dd is the Days value (00 to 31)</i> <i>Where mm is the Months value (00 to 12)</i> <i>Where yy is the Years value (00 to 12)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets the date in an attached RoboTock module. Example Commands Example 1: Set RoboTock to 01/01/05 Command: (SSDD010105) Response: (ACK) Example 2: Set RoboTock to 31/12/99 Command: (SSDD311299) Response: (ACK)

Ref: 8.3
Command Set: Real Time Clock Module Commands (RoboTock)
Command Name: Read Time from RoboTock
Command Format: (RDT)
RoboMicro Response: (RDThhmmss) or (NAK) <i>Where hh is the Hours value (00 to 23)</i> <i>Where mm is the Minutes value (00 to 59)</i> <i>Where ss is the Seconds value (00 to 59)</i>
Functional Description: This command read the current time from an attached RoboTock module. Example Commands Example 1: Read RoboTock time Command: (RDT) Response: (RDT010115)

Ref: 8.4
Command Set: Real Time Clock Module Commands (RoboTock)
Command Name: Read Date from RoboTock
Command Format: (RDD)
RoboMicro Response: (RDDddmmyy) or (NAK) <i>Where dd is the Days value (00 to 31)</i> <i>Where mm is the Months value (00 to 12)</i> <i>Where yy is the Years value (00 to 12)</i>
Functional Description: This command read the current date from an attached RoboTock module. Example Commands Example 1: Read RoboTock date Command: (RDD) Response: (RDD120405)

Ref: 9.1
Command Set: Digital Temperature Sensor DS18B20 Commands
Command Name: Mount Sensor in Temperature Sensor Net
Command Format: (SSTMxaabbccddeeffgghh) <i>Where x is the temperature sensor net location ID (1,2,3 or 4)</i> <i>Where aa to hh is the internal address of the DS18B20 sensor</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command sets RoboMicro to use the supplied ID when communicating with the temperature sensor in the identified temperature sensor net location. <i>(See DS18B20 datasheet for full detail on how to use this sensor)</i> Example Commands Example 1: Set DS18B20 id [1234567887654321] into location 3 of temp net Command: (SSTM31234567887654321) Response: (ACK)

Ref: 9.2
Command Set: Digital Temperature Sensor DS18B20 Commands
Command Name: Un-Mount Sensor from Temperature Sensor Net
Command Format: (SSUMx) <i>Where x is the temperature sensor net location ID (1,2,3 or 4)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command removes the sensor ID from the identified temperature sensor net location. <i>(See DS18B20 datasheet for full detail on how to use this sensor)</i> Example Commands Example 1: Remove Temperature Sensor ID for Temp sensor location 4 Command: (SSUM4) Response: (ACK)

Ref: 9.3
Command Set: Digital Temperature Sensor DS18B20 Commands
Command Name: Report DS18B20 ID stored in Temperature Sensor Location
Command Format: (SRTIx) <i>Where x is the temperature sensor net location ID (1,2,3 or 4)</i>
RoboMicro Response: (SRTIxaabccddeeffgghh) or (NAK) <i>Where x is the temperature sensor net location ID (1,2,3 or 4)</i> <i>Where aa to hh is the internal address of the DS18B20 sensor</i>
Functional Description: This command reports the stored DS18B20 ID stored in the identified temperature sensor net location. <i>(See DS18B20 datasheet for full detail on how to use this sensor)</i> Example Commands Example 1: Read DS18B20 id from location 2 of temp sensor net Command: (SRTI2) Response: (SRTI21234567887654321)

Ref: 9.4
Command Set: Digital Temperature Sensor DS18B20 Commands
Command Name: Read DS18B20 Temperature Value
Command Format: (RTTx) <i>Where x is the temperature sensor net location ID (1,2,3 or 4)</i>
RoboMicro Response: (RTTxssddd.nnn) or (NAK) <i>Where x is the temperature sensor net location ID (1,2,3 or 4)</i> <i>Where s is the temperature sign (+/-)</i> <i>Where ddd is the number of whole degrees</i> <i>Where nnn is the fraction of degree</i>
Functional Description: This command causes the DS18B20 in the temperature sensor net location to carry out a conversion and report the temperature value. The DS18B20 can take >700ms to complete the conversion process, so there will be a delay of 1second before the value is reported back to the requester. <i>(See DS18B20 datasheet for full detail on how to use this sensor)</i> Example Commands Example 1: Read DS18B20 temperature from location 3 of temp sensor net Command: (RTT3) Response: (RTT3-003.453)

Ref: 10.1
Command Set: I2C Bus Commands
Command Name: Enable/Disable I2C Bus Operation
Command Format:
(SSI2Cx)
<i>Where x will enable or disable I2C bus operation. (1=Enable I2C Bus, 0=Disable I2C Bus)</i>
RoboMicro Response:
(ACK) or (NAK)
Functional Description: This command enables or disables I2C Bus Driver operation of RoboMicro. (Default value is Disabled). In order to use the SRF08, RoboTock and other I2C bus modules, the I2C Bus needs to be enabled. If the I2C bus is not enabled every I2C command sent to RoboMicro will be (NAK) and ignored by RoboMicro <i>(See I2C datasheet for full detail on how to use this bus)</i>
Example Commands
Example 1: Enable I2C Bus Operation Command: (SSI2C1) Response: (ACK)

Ref: 10.2
Command Set: I2C Bus Commands
Command Name: Read I2C Bus Status
Command Format:
(SRI2C)
RoboMicro Response:
(SRI2Cx) or (NAK)
<i>Where x is the status flag of the I2C bus (1=Enabled I2C Bus, 0=Disabled)</i>
Functional Description: This command reports the enabled/disabled status of the I2C Bus on RoboMicro. (Default value is Disabled). In order to use the SRF08, RoboTock and other I2C bus modules, the I2C Bus needs to be enabled. If the I2C bus is not enabled every I2C command sent to RoboMicro will be (NAK) and ignored by RoboMicro <i>(See I2C datasheet for full detail on how to use this bus)</i>
Example Commands
Example 1: Read I2C Bus Status Command: (SRI2C) Response: (SRI2C)

Ref: 10.3
Command Set: I2C Bus Commands
Command Name: I2C Bus Idle Status (Low-Level Command)
Command Format: (I2CI)
RoboMicro Response: (I2Cx) or (NAK) <i>Where x is the idle status of the I2C bus (1=Idle, 0=Busy)</i>
Functional Description: This is a low-level I2C command to allow the user to talk directly on the I2C bus. This command checks the idle/busy status of the I2C Bus. (See doc "RoboMicro: I2C Bus Explained for full detail on how to use this command) (See I2C datasheet for full detail on how to use this bus) Example Commands Example 1: Read I2C Bus Idle status Command: (I2CI) Response: (I2C1)

Ref: 10.4
Command Set: I2C Bus Commands
Command Name: I2C Bus Start Request (Low-Level Command)
Command Format: (I2CS)
RoboMicro Response: (ACK) or (NAK)
Functional Description: This is a low-level I2C command to allow the user to talk directly on the I2C bus. This command signals a start request on the I2C Bus. (See doc "RoboMicro: I2C Bus Explained for full detail on how to use this command) (See I2C datasheet for full detail on how to use this bus) Example Commands Example 1: Send Start Request on I2C Bus Command: (I2CS) Response: (ACK)

Ref: 10.5
Command Set: I2C Bus Commands
Command Name: I2C Bus Stop Request (Low-Level Command)
Command Format: (I2CP)
RoboMicro Response: (ACK) or (NAK)
Functional Description: This is a low-level I2C command to allow the user to talk directly on the I2C bus. This command signals a stop request on the I2C Bus. (See doc "RoboMicro: I2C Bus Explained for full detail on how to use this command) (See I2C datasheet for full detail on how to use this bus) Example Commands Example 1: Send Stop Request on I2C Bus Command: (I2CP) Response: (ACK)

Ref: 10.6
Command Set: I2C Bus Commands
Command Name: I2C Bus Write Byte (Low-Level Command)
Command Format: (I2CWnnn) <i>Where nnn is the byte to be written to the I2C bus</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This is a low-level I2C command to allow the user to talk directly on the I2C bus. This command writes the supplied byte to a slave I2C node on the I2C bus. (See doc "RoboMicro: I2C Bus Explained for full detail on how to use this command) (See I2C datasheet for full detail on how to use this bus) Example Commands Example 1: Send the byte 0xFF on I2C Bus Command: (I2CW255) Response: (ACK)

Ref: 10.7
Command Set: I2C Bus Commands
Command Name: I2C Bus Read Byte + Ack Response (Low-Level Command)
Command Format: (I2CRA)
RoboMicro Response: (I2CRAnnn) or (NAK) <i>Where nnn is the byte read from the I2C bus</i>
Functional Description: This is a low-level I2C command to allow the user to talk directly on the I2C bus. This command reads one byte from the I2C bus. After the read has taken place an ACK is sent across the I2C bus. (See doc "RoboMicro: I2C Bus Explained for full detail on how to use this command") (See I2C datasheet for full detail on how to use this bus) Example Commands Example 1: Send the byte 0xFF on I2C Bus Command: (I2CRA) Response: (I2CRA253)

Ref: 10.8
Command Set: I2C Bus Commands
Command Name: I2C Bus Read Byte + No Ack Response (Low-Level Command)
Command Format: (I2CRN)
RoboMicro Response: (I2CRN$nnnn$) or (NAK) <i>Where nnn is the byte read from the I2C bus</i>
Functional Description: This is a low-level I2C command to allow the user to talk directly on the I2C bus. This command reads one byte from the I2C bus. No ACK response is sent after the read is complete. (See doc "RoboMicro: I2C Bus Explained for full detail on how to use this command") (See I2C datasheet for full detail on how to use this bus) Example Commands Example 1: Send the byte 0xFF on I2C Bus Command: (I2CRN) Response: (I2CRN253)

Ref: 11.1
Command Set: 1-Wire Bus Commands
Command Name: Enable/Disable 1-Wire Bus Operation
Command Format: (SS1Wx) <i>Where x will enable or disable the 1-Wire bus (1=Enable, 0=Disable)</i>
RoboMicro Response: (ACK) or (NAK)
Functional Description: This command enables or disables 1-Wire Bus Driver operation of RoboMicro. (Default value is Disabled). In order to use the DS18B20 Temperature Sensors and other 1-Wire bus modules, the 1-Wire Bus needs to be enabled. If the 1-Wire bus is not enabled every 1-Wire command sent to RoboMicro will be (NAK) and ignored by RoboMicro <i>(See 1-Wire Bus datasheet for full detail on how to use this bus)</i> Example Commands Example 1: Enable 1-Wire Bus Operation Command: (SS1W1) Response: (ACK)

Ref: 11.2
Command Set: 1-Wire Bus Commands
Command Name: Read 1-Wire Bus Status
Command Format: (SR1W)
RoboMicro Response: (SR1Wx) or (NAK) <i>Where x is the status flag of the 1-Wire bus (1=Enabled, 0=Disabled)</i>
Functional Description: This command reports the enabled/disabled status of the 1-Wire bus (Default value is Disabled). In order to use the DS18B20 Temperature Sensors and other 1-Wire bus modules, the 1-Wire Bus needs to be enabled. If the 1-Wire bus is not enabled every 1-Wire command sent to RoboMicro will be (NAK) and ignored by RoboMicro <i>(See 1-Wire Bus Datasheet for full detail on how to use this bus)</i> Example Commands Example 1: Read 1-Wire Bus Status Command: (SR1W) Response: (SR1W1)

Ref: 11.3
Command Set: 1-Wire Bus Commands
Command Name: 1-Wire Bus Idle Status (Low-Level Command)
Command Format:
(1WI)
RoboMicro Response:
(1Wx) or (NAK) <i>Where x is the status flag of the 1-Wire bus (1=Idle, 0=Busy)</i>
Functional Description: This is a low-level 1-Wire bus command to allow the user to talk directly on the 1-Wire bus. This command checks the 1-Wire bus idle status. (See doc "RoboMicro: 1-Wire Bus Explained" for full detail on how to use this command) (See 1-Wire Bus Datasheet for full detail on how to use this bus) Example Commands Example 1: Check Bus status of 1-Wire bus Command: (1WI) Response: (1WI1)

Ref: 11.4
Command Set: 1-Wire Bus Commands
Command Name: 1-Wire Bus Write Byte (Low-Level Command)
Command Format:
(1WWnnn) <i>Where nnn is the byte to be written across the I2C bus</i>
RoboMicro Response:
(ACK) or (NAK)
Functional Description: This is a low-level 1-Wire bus command to allow the user to talk directly on the 1-Wire bus. This command writes the supplied byte across the 1-Wire bus. (See doc "RoboMicro: 1-Wire Bus Explained" for full detail on how to use this command) (See 1-Wire Bus Datasheet for full detail on how to use this bus) Example Commands Example 1: Write the byte 0xA5 across 1-Wire bus Command: (1WW165) Response: (ACK)

Ref: 11.5
Command Set: 1-Wire Bus Commands
Command Name: 1-Wire Bus Read Byte (Low-Level Command)
Command Format: (1WR)
RoboMicro Response: (1WRnnn) or (NAK) <i>Where nnn is the byte read from the 1-Wire bus</i>
Functional Description: This is a low-level 1-Wire bus command to allow the user to talk directly on the 1-Wire bus. This command reads one byte from the 1-Wire bus. (See doc "RoboMicro: 1-Wire Bus Explained" for full detail on how to use this command) (See <i>1-Wire Bus Datasheet</i> for full detail on how to use this bus) Example Commands Example 1: Read one byte from 1-Wire bus. Command: (1WR) Response: (1WR165)