

Robotnacka communication protocol.

Communication parameters: 19200Baudov,8bit,no parity.

Conditional statement(11B):

!EaijjkkYY - sensor condition,

The following commands complete only if condition is not satisfied

ii XOR bitmask

jj OR bitmask,

kk AND bitmask

1. $S^{ii}=xx$

2. $xx\&jj=oo$

3. $xx\&kk=aa$

Condition satisfied, iff $(oo!=0) \&\& (aa==kk)$

When condition occurs, response EaiiYY is sent, ii = sensors

Position statement(10B):

!PabxxxxYY

xxxx-number of steps $\langle 0,9999 \rangle$

a-robot number $\langle 0,9 \rangle$

b-direction: 'f' 'b' 'l' 'r' = 'forward' 'backward' 'left' 'right'

YY=checksum

Speed command (10B):

!RabxxyyYY

xxyy-left wheel speed (xx) and right wheel speed (yy) in interval $\langle 0,99 \rangle$

a-robot number $\langle 0,9 \rangle$

b-direction: 'f' 'b' 'l' 'r' = 'forward' 'backward' 'left' 'right'

YY=checksum

Position command with different speed (14B):

!QabxxyyzzzzYY

xx(left motor) yy(right motor) a zzzz – number of steps of faster motor

a-robot number $\langle 0,9 \rangle$

b-direction: 'f' 'b' 'l' 'r' = 'forward' 'backward' 'left' 'right'

YY=checksum

Other commands(5B):

!IaYY

i-init – initialize all buffers and reset robot (connection will be lost)

!DaYY

d-pen down

!UaYY

u-pen up

a-robot number<0,9>

YY=checksum

Robot response (follows commands immediately):ok: **XaYY**err: **ZaKKYY**, KK – correct checksumok, but low power: **BaYY** (only for motor commands)Robot query commands(5B):**?AaYY** - alive?reply: **XaYY** - yes**ZaKKYY** - checksum error**?SaYY** - sensor statereply: **SaxxYY** - xx <0,64> - bit state for 6 sensors, 1=black, 0=white**ZaKKYY** - checksum error**?VaYY** - battery powerreply: **VaxxYY** - xx je voltage in decivolts. Ca. 51 dV – auto power off**ZaKKYY** – checksum error**?CaYY** - statusreply: **YaYY** - executing speed command**NaYY** - executing position command**WaYY** - idle, waiting for command, this packet is always sent after position command completes**ZaKKYY** - checksum error**?FaYY** - firmware versione.g.: **RaV8BT**Gripper commands(6B):**!HabYY** - gripper control

a – robot number <0,9>

b – command:('u,d,o,z,U,D,O,Z'='up,down,open,close,UP,DOWN,OPEN,CLOSE')
YY=checksum

Speaker commands(14B):

!TabxxxxzzzzYY - speaker control (in foreground)
a – robot number<0,9>
b – (control regular robot beeping: „+“ on „-“ off)
xxxx – tone pitch
zzzz – dlzka length
YY=checksum

!LabxxxxzzzzYY - speaker control (in background)
a – robot number <0,9>
b – (control regular robot beeping:„+“ on „-“ off)
xxxx – tone pitch
zzzz – tone length
YY=checksum

Service commands:

#Na - set robot number
a – new robot number (0-9),
error – response with: "BadNum"
ok – response with "Num"a
applies after reset