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UCB-MIND communication

Code: **RSR641**
Description UCB-MIND communication
Customer: VEII
File name: 641SW15 communication UCB-MIND.doc

Revision	Date	Changes	Name
bozza	2010/03/15		Ezio
Revision	2010/04/07	Expanded description and values on status Added credit available on status	Ezio
Revision	2010/10/14	Added price query command, updated programming message with machine disable and discount	Ezio
Draft	09/05/11	Added command to know discounted selections	Alessandro
Revision	22/09/12	Added command LED, DEX, REV and updated command SELL	Alessandro
Revision	30/09/12	Added command MAXCREDIT, added STX to DEX? Answer rev is 072X	Alessandro
Revision	12/10/12	Added ETX to the end of command DEX?, some better explanation on STATUS command	Alessandro
Revision	13/10/12	Changed READ?, taking out END and adding ETX to the end of the answer	Alessandro
Revision	20/04/13	Added details on td.	Alessandro
Revision	08/08/13	Changed the max number of digit of credit value	Alessandro
Revision	09/10/13	Added KEY and LOAD commands	Michele
Revision	20/11/13	Update motor coupling description	Michele
Revision	04/03/14	Slave command added	Michele
Revision	09/04/14	Boot status command added	Michele

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1. Channel

Serial communication:

RxD
TxD
GND

Baud rate: 9600

Parity: none

Data bit: 8

Stop bit: 1

Signal level: TTL

MIND – CN4		UCB – CN7
4 - GND		2 – GND
2 – RxD		3 – TxD
3 – TxD		4 – RxD

2. Protocol

MIND is the master and the UCB is the slave.

Every command from the master has a reply from the slave.

Basically two types of commands are used:

- Operating commands
- Programming commands

Command/response structure is:

STX *start of message*
... *payload*
CR/LF *end of message*

the “payload” is built by a list of parameters separated by “;” (semicolon); sometime the list include optional parametrs, which may not be sent; if a parameter is not sent its “;” is not needed also to be sent. An example is the SELL; command

SELL;110 CR/LF will ask to sell selection 110 with the default price

SELL;110;75CR/LF will ask to sell selection 110 with the given price of 75C

Exceptions

Because the DEX? Command has an answer made of many rows, the end of the DEX file is given with the ETX character.

Every command has only one answer, with the exception of the SELL; see details below.

2.1. Operating commands

The operating commands are a Group of commands to read status and start sales, get machine status and working parameters.

- Read status

Command structure

STX status? CR/LF

Reply structure

STX status;<status_word>;<credit>;<optional status1>;<optional status2>;<optional status2>; CR/LF

< status_word >machine status:

Lower digit

0=ready

1=ready/exact change

2=selection start, motor start moving

3=after (2) when motor stops, selection ok

4=after (2) when motor stops, selection failed

5=error selection locked, nothing happens

6=error selection not available, nothing happens

7=error selection price higher than available credit

8=programming mode

U=unknown message, or any error in the message

Higher digit

0x= door close

1x= door open

< credit> amount available

< optional_status1 > temperature in refrigerated machine, the string F<temperature>

< optional_status2 > Health status, the string H<status>

< optional_status3 > motion sensor status, the string S<status>

- Make selection

Command structure

STX sell;<selection_row_column>;<optional_sell_price>CR/LF

<selection_row_column> any available machine selection

<optional_sell_price> OPTIONAL parameter; if not sent the selling price is the default stored into UCB; if sent, the sell price has this value, even ZERO.

Reply structure

STX status;<status_word>;<credit>;<optional status1>;<optional status2>;<optional status2>; CR/LF

After sending the SELL; command there is an immediate status; answer with this possible outcome

< status_word >machine status:

1=ready/exact change

2=selection start, motor start moving

3=after (2) when motor stops, selection ok

4=after (2) when motor stops, selection failed

5=error selection locked, nothing happens

6=error selection not available, nothing happens

7=error selection price higher than available credit

8=programming mode

U=unknown message

The selection will start only if the answer is 2 (two); with any other answer the selection is not started and the fault reason is given in the answer itself

If the selection is started, the the UCB will not accept any other command till the selection is running. At the end of the selection, a second, asynchronous status reply is send from UCB, with possible outcome 3 or 4 to know if the section is terminated ok or failed.

- Read price

Command structure

STX price? <selection_row_column> CR/LF

Reply structure

STX price;<amount>;<discounted>;<status_word>;<credit_available> CR/LF

<selection_row_column> could be any valid selection for the machine

< amount > selection price – max 999.99

< discounted > price to pay (calculated with discounts, if apply) max 999.99

< status_word > machine status: see 'Make selection' command

< credit_available > amount available

- Read discounted selection list

Command structure

STX discount? CR/LF

Reply structure

STX discount;<selection_row_column>;<selection_row_column>;.....CR/LF

<selection_row_column> could be any valid selection for the machine which is discounted

(this data is repeated for any discounted selection, which is limited by a machine parameter NonVolatileSetup.discountMaxSel)

- Read list of available selections

Command structure

STX sels? CR/LF

Reply structure

STX sels;<selection_row_column>;<selection_row_column>;.....CR/LF

<selection_row_column> could be any valid selection for the machine

- Read list of disabled selections

Command structure

STX disabled? CR/LF

Reply structure

STX disabled;<selection_row_column>;<selection_row_column>;.....CR/LF

<selection_row_column> could be any valid selection for the machine which is disabled

- Read dex data file

Command structure

STX DEX? CR/LF

Reply structure

STX <full dex file> ETX- Read software revision of UCB

Command structure

STX REV? CR/LF

Reply structure

STX rev;<machineID>-<firmwarerelease>CR/LF

<machineID> up to 8 character string, es. VEI-DOOR

<firmwarerelease> 4 character string, es 072Z

- Set LED light intensity

Command structure

STX LED; <LedIntensity>CR/LF

Reply structure

STX CR/LF

<LedIntensity> numeric value 0-100%; led intensity is set to the programmed value; Motion sensor will not modify the programmed intensity IF the intensity is different from 100%; setting intensity to 100% will enable again motion sensor control of LED light intensity,

- Read the available credit

Command structure

STX Funds? CR/LF

Reply structure

STX funds;<cash>;<cashless> CR/LF

<cash> available credit inserted as cash (coins and bills, tokens)

<cashless> available credit inserted as cashless (cards, credit cards, etc..)

- set Escrow function

Command structure

STX escrow CR/LF

Reply structure

STX CR/LF

On Marchand6 model the reply sequence is different:

Reply structure

STX CR/LF

STX status;02;<credit>;<optional status1>;<optional status2>;<optional status2>; CR/LF

STX status;03;<credit>;<optional status1>;<optional status2>;<optional status2>; CR/LF

- Set MACxredit accepted by machine

Command structure

STX MAXCREDIT; <maxcredit>CR/LF

Reply structure

STX CR/LF

<maxcredit> maximum amount accepted by the machine before disabling payment systems. If set less than the max selection price, the machine will take in any case the max selection price and maxcredit.

NOTE : thus value has to be verified with tube and bill escrow to enable return all the inserted amount

- Keypad emulation with serial port returning current display visualization

Command structure

STX key; <key1>...<key12> CR/LF

Reply structure

STX display; <display char 1>...<display char 16> CR/LF

It is possible to send from 0 up to 12 (the keypad buffer dimension) keys;

The current display buffer (before new key sequence takes effect) is send as a response

To retrieve the display buffer only send the command with no key **STX key; CR/LF**

- Slaves presence

Command structure

STX slaves? CR/LF

Reply structure

STX slaves; <slave 1><slave 2><slave 3> CR/LF

The value of <slave X> is 0 if the slave is not present and 1 if the slave is connected to master.

2.2. Programming commands

The programming commands can be used to upload and download settings on the UCB.

The commands are:

- Read settings

Command structure

STX read? CR/LF

Reply structure

STX <setting1> CR/LF**STX <setting2> CR/LF**

...

STX <setting_n> CR/LF**ETX**

- Store settings

Command structure

STX <setting1> CR/LF**STX <setting2> CR/LF**

...

STX <setting_n> CR/LF

Reply structure

STX ok CR/LF

<setting_n> can be any of this

text file	description
CSV;1.0.0	header (must be the first row of the file)
machine;AP7000	machine type
boot;#0.0.2	boot version
firmware;#0.0.0	firmware version
assetID;	asset ID
ddmmyyyy;21/6/2008 10:37	settings date time information was saved
selection;value sel.110;5 sel.111;25 sel.119;5 sel.120;5 sel.198;5 sel.199;5	selections price header Selection price for row, column: A is the first row, B the second and so on. All the possible prices for all the machine supported by the UCB, including Slave machines are saved, even if not present on the machine type; The selection is stored in the same format used by the keypad of the machine
adv.msg;ACME adv.delay;3 adv.speed;5	advertising message text - adv message delay - adv message scrol speed
group;amount gp.G0;5 gp.G1;10 gp.G2;0 gp.G3;0 gp.G4;0 gp.G5;0 gp.G6;0 gp.G7;0 gp.G8;0 gp.G9;0	- groups price header (<u>OPTION</u>) - price for 'group 0' - price for 'group 1' ... - selections inside the group of price (see before) header - first selection of the price group 0

group;row;col gs.G0;0;0 gs.G0;0;0 gs.G9;0;0 selGroup;row;col gt.G0;0;0 gt.G0;0;0 gt.G9;0;0 timeframe;group;day;off;on tf.0;0;0;00.00;00.00 tf.0;0;0;00.00;00.00 tf.0;0;0;00.00;00.00 tf.0;0;0;00.00;00.00 tf.0;0;0;00.00;00.00	<ul style="list-style-type: none"> - second selection of the price group 0 ... - last selection of the price group 9 <ul style="list-style-type: none"> - group of selections header - first selection of the group 0 - second selection of the group 0 ... - last selection of the group 9 <ul style="list-style-type: none"> - timeframes header - timeframe information with the format: tf.g.wd.hh.mm.HH.MM g timeframe number wd week day hh.mm starting time HH.MM ending time
setting;value dropSensor;0 ds.110;0 ds.112;0	Settings header <ul style="list-style-type: none"> - all drop sensor settings - drop sensor functionality per selection
set.escrow;0	set bill escrow: 0=no, 1=yes
set.forceVend;0	set force vend: 0=no, 1=yes
set.fillTube;1	set fill tube: 0=no, 1=yes
set.percDimming;0 set.timeDimming;0	set LED1 dimming percentage: 0...100 set LED timeout for dimming time: 0...99sec
set.motorCoupled.110;0 set.motorCoupled.120;0 set.motorCoupled.130;0	<ul style="list-style-type: none"> - set motor coupling on VEI147/ NAT157: 0=off, 'x'=single digit showing the odd motor coupled (the next motor for each even motor, for example set.motorCoupled.120;1 means 120 coupled with 121) - set motor coupling on VED1000: 0=off, 'x'= single digit showing the odd motor coupled (it could be the next or one of odd following motors, for example set.motorCoupled.130;9, means 130 coupled with 139; all the selection included in this range, except for 130 are locked)
set.setSingleVend;1	enable Single Vend
set.tubeValue;0	Set the minimal amount always available in the tubes
set.DropHome;1	set automatic motor homing: 0=disable, 1=enable
set.percTax;1050	Set tax valued when TAX display is used
set.WinValue;156	Set number of vend after which a free vend is done
set.discountFlag;1 set.discountPerc1;5 set.discountDays1;15 set.discountPerc2;20 set.discountDays2;25 set.discountDaysReset;30 set.discountMaxSel;50 set.discountDoorClear;0	Discount active is set to 1 1 st discount percentage 1 st discount no moving period – days 2 nd discount percentage 2 nd discount no moving period – days number of selections to be made to reset discount Max discount (in percentage) to apply set to 1 if Discounts are reset on door open

set.Temperatura;50	Set operating temperature (Fahrenheit)
td.disable.0;0,1,23,0 td.enable.0;1,2,34,0 td.disable.1;2,3,45,0 td.enable.1;3,4,56,0 td.disable.4;4,10,20,0 td.enable.4;5,11,22,0 td.disable.5;6,5,45,0 td.enable.5;7,6,54,0 td.disable.9;8,11,59,0 td.enable.9;8,12,1,12	Set disable and enable time of up to 10 group: . the 1st number is the group id (0...9) . the 2nd number is the day of week . the 3rd is the hour . the 4 th is the minute . the 5 th is the AM(=0) or PM (=12) Day of week : Monday = 0, Tuesday = 1, Wednesday = 2, Thursday = 3, Friday = 4, Saturday = 5, Sunday = 6, WorkingDays = 7, AllDays = 8
sel.Lockout.0;111;122 sel.Lockout.4;121;122;123	<i>program list of selections on a lock group (eg. group 0 has selection 111 and 122)</i> <u>OPTION</u>
sel.Upfront.0;126;127 sel.Upfront.1;133;134;135 sel.Upfront.2;145;146;147;148;149	<i>program list of selections on a single group whose supply is managed by the machine (eg. group 0 has selections 126 and 127 alternately dispensed)</i> <u>OPTION</u>
set.ledOnTimeOut;10 set.flashingLedOn;5 set.flashingLedOff;1	Set active time for LED on the vend bucket after a VEND During the active time, this is the time led is light ON and this the OFF time (flashing); id set to 0 the led is ON all active time. Values in second.

Example of "not yet configured machine" settings

CSV;1.0.0	sel.131;900	sel.159;900
machine;NAT157	sel.132;900	sel.160;900
boot;#0.0.3	sel.133;900	sel.161;900
firmware;#7.5.P	sel.134;900	sel.162;900
assetID;	sel.135;900	sel.163;900
ddmmyyyy;20/11/2013 13:10	sel.136;900	sel.164;900
selection;value	sel.137;900	sel.165;900
sel.110;900	sel.138;900	sel.166;900
sel.111;900	sel.139;900	sel.167;900
sel.112;900	sel.140;900	sel.168;900
sel.113;900	sel.141;900	sel.169;900
sel.114;900	sel.142;900	sel.170;900
sel.115;900	sel.143;900	sel.171;900
sel.116;900	sel.144;900	sel.172;900
sel.117;900	sel.145;900	sel.173;900
sel.118;900	sel.146;900	sel.174;900
sel.119;900	sel.147;900	sel.175;900
sel.120;900	sel.148;900	sel.176;900
sel.121;900	sel.149;900	sel.177;900
sel.122;900	sel.150;900	sel.178;900
sel.123;900	sel.151;900	sel.179;900
sel.124;900	sel.152;900	sel.180;900
sel.125;900	sel.153;900	sel.181;900
sel.126;900	sel.154;900	sel.182;900
sel.127;900	sel.155;900	sel.183;900
sel.128;900	sel.156;900	sel.184;900
sel.129;900	sel.157;900	sel.185;900
sel.130;900	sel.158;900	sel.186;900

sel.187;900	sel.260;900	sel.333;900
sel.188;900	sel.261;900	sel.334;900
sel.189;900	sel.262;900	sel.335;900
sel.190;900	sel.263;900	sel.336;900
sel.191;900	sel.264;900	sel.337;900
sel.192;900	sel.265;900	sel.338;900
sel.193;900	sel.266;900	sel.339;900
sel.194;900	sel.267;900	sel.340;900
sel.195;900	sel.268;900	sel.341;900
sel.196;900	sel.269;900	sel.342;900
sel.197;900	sel.270;900	sel.343;900
sel.198;900	sel.271;900	sel.344;900
sel.199;900	sel.272;900	sel.345;900
sel.210;900	sel.273;900	sel.346;900
sel.211;900	sel.274;900	sel.347;900
sel.212;900	sel.275;900	sel.348;900
sel.213;900	sel.276;900	sel.349;900
sel.214;900	sel.277;900	sel.350;900
sel.215;900	sel.278;900	sel.351;900
sel.216;900	sel.279;900	sel.352;900
sel.217;900	sel.280;900	sel.353;900
sel.218;900	sel.281;900	sel.354;900
sel.219;900	sel.282;900	sel.355;900
sel.220;900	sel.283;900	sel.356;900
sel.221;900	sel.284;900	sel.357;900
sel.222;900	sel.285;900	sel.358;900
sel.223;900	sel.286;900	sel.359;900
sel.224;900	sel.287;900	sel.360;900
sel.225;900	sel.288;900	sel.361;900
sel.226;900	sel.289;900	sel.362;900
sel.227;900	sel.290;900	sel.363;900
sel.228;900	sel.291;900	sel.364;900
sel.229;900	sel.292;900	sel.365;900
sel.230;900	sel.293;900	sel.366;900
sel.231;900	sel.294;900	sel.367;900
sel.232;900	sel.295;900	sel.368;900
sel.233;900	sel.296;900	sel.369;900
sel.234;900	sel.297;900	sel.370;900
sel.235;900	sel.298;900	sel.371;900
sel.236;900	sel.299;900	sel.372;900
sel.237;900	sel.310;900	sel.373;900
sel.238;900	sel.311;900	sel.374;900
sel.239;900	sel.312;900	sel.375;900
sel.240;900	sel.313;900	sel.376;900
sel.241;900	sel.314;900	sel.377;900
sel.242;900	sel.315;900	sel.378;900
sel.243;900	sel.316;900	sel.379;900
sel.244;900	sel.317;900	sel.380;900
sel.245;900	sel.318;900	sel.381;900
sel.246;900	sel.319;900	sel.382;900
sel.247;900	sel.320;900	sel.383;900
sel.248;900	sel.321;900	sel.384;900
sel.249;900	sel.322;900	sel.385;900
sel.250;900	sel.323;900	sel.386;900
sel.251;900	sel.324;900	sel.387;900
sel.252;900	sel.325;900	sel.388;900
sel.253;900	sel.326;900	sel.389;900
sel.254;900	sel.327;900	sel.390;900
sel.255;900	sel.328;900	sel.391;900
sel.256;900	sel.329;900	sel.392;900
sel.257;900	sel.330;900	sel.393;900
sel.258;900	sel.331;900	sel.394;900
sel.259;900	sel.332;900	sel.395;900

sel.396;900	sel.469;900	gp.G28;0
sel.397;900	sel.470;900	gp.G29;0
sel.398;900	sel.471;900	gp.G30;0
sel.399;900	sel.472;900	gp.G31;0
sel.410;900	sel.473;900	gp.G32;0
sel.411;900	sel.474;900	gp.G33;0
sel.412;900	sel.475;900	gp.G34;0
sel.413;900	sel.476;900	gp.G35;0
sel.414;900	sel.477;900	gp.G36;0
sel.415;900	sel.478;900	gp.G37;0
sel.416;900	sel.479;900	gp.G38;0
sel.417;900	sel.480;900	gp.G39;0
sel.418;900	sel.481;900	gp.G40;0
sel.419;900	sel.482;900	gp.G41;0
sel.420;900	sel.483;900	gp.G42;0
sel.421;900	sel.484;900	gp.G43;0
sel.422;900	sel.485;900	gp.G44;0
sel.423;900	sel.486;900	gp.G45;0
sel.424;900	sel.487;900	gp.G46;0
sel.425;900	sel.488;900	gp.G47;0
sel.426;900	sel.489;900	gp.G48;0
sel.427;900	sel.490;900	gp.G49;0
sel.428;900	sel.491;900	gp.G50;0
sel.429;900	sel.492;900	gp.G51;0
sel.430;900	sel.493;900	gp.G52;0
sel.431;900	sel.494;900	gp.G53;0
sel.432;900	sel.495;900	gp.G54;0
sel.433;900	sel.496;900	gp.G55;0
sel.434;900	sel.497;900	gp.G56;0
sel.435;900	sel.498;900	gp.G57;0
sel.436;900	sel.499;900	gp.G58;0
sel.437;900	adv.msg;	gp.G59;0
sel.438;900	adv.delay;0	gp.G60;0
sel.439;900	adv.speed;0	gp.G61;0
sel.440;900	group;amount	gp.G62;0
sel.441;900	gp.G0;0	gp.G63;0
sel.442;900	gp.G1;0	gp.G64;0
sel.443;900	gp.G2;0	gp.G65;0
sel.444;900	gp.G3;0	gp.G66;0
sel.445;900	gp.G4;0	gp.G67;0
sel.446;900	gp.G5;0	gp.G68;0
sel.447;900	gp.G6;0	gp.G69;0
sel.448;900	gp.G7;0	gp.G70;0
sel.449;900	gp.G8;0	gp.G71;0
sel.450;900	gp.G9;0	gp.G72;0
sel.451;900	gp.G10;0	gp.G73;0
sel.452;900	gp.G11;0	gp.G74;0
sel.453;900	gp.G12;0	gp.G75;0
sel.454;900	gp.G13;0	gp.G76;0
sel.455;900	gp.G14;0	gp.G77;0
sel.456;900	gp.G15;0	gp.G78;0
sel.457;900	gp.G16;0	gp.G79;0
sel.458;900	gp.G17;0	gp.G80;0
sel.459;900	gp.G18;0	gp.G81;0
sel.460;900	gp.G19;0	gp.G82;0
sel.461;900	gp.G20;0	gp.G83;0
sel.462;900	gp.G21;0	gp.G84;0
sel.463;900	gp.G22;0	gp.G85;0
sel.464;900	gp.G23;0	gp.G86;0
sel.465;900	gp.G24;0	gp.G87;0
sel.466;900	gp.G25;0	gp.G88;0
sel.467;900	gp.G26;0	gp.G89;0
sel.468;900	gp.G27;0	gp.G90;0

gp.G91;0	tf.35;G0;0;0;00.00;00.00	set.motorCoupled.180;0
gp.G92;0	tf.36;G0;0;0;00.00;00.00	set.motorCoupled.182;0
gp.G93;0	tf.37;G0;0;0;00.00;00.00	set.motorCoupled.184;0
gp.G94;0	tf.38;G0;0;0;00.00;00.00	set.motorCoupled.186;0
gp.G95;0	tf.39;G0;0;0;00.00;00.00	set.motorCoupled.188;0
gp.G96;0	setting;value	set.motorCoupled.190;0
gp.G97;0	dropSensor;0	set.motorCoupled.192;0
gp.G98;0	set.escrow;0	set.motorCoupled.194;0
gp.G99;0	set.forceVend;0	set.motorCoupled.196;0
priceGroup;selections	set.fillTube;1	set.motorCoupled.198;0
selGroup;selections	set.percDimming;0	set.setSingleVend;0
timeframe;group;day;off;on	set.timeDimming;0	set.tubeValue;0
tf.0;G0;0;0;00.00;00.00	set.motorCoupled.110;0	set.DropHome;0
tf.1;G0;0;0;00.00;00.00	set.motorCoupled.112;0	set.percTax;0
tf.2;G0;0;0;00.00;00.00	set.motorCoupled.114;0	set.WinValue;0
tf.3;G0;0;0;00.00;00.00	set.motorCoupled.116;0	set.discountFlag;0
tf.4;G0;0;0;00.00;00.00	set.motorCoupled.118;0	set.discountPerc1;0
tf.5;G0;0;0;00.00;00.00	set.motorCoupled.120;0	set.discountDays1;0
tf.6;G0;0;0;00.00;00.00	set.motorCoupled.122;0	set.discountPerc2;0
tf.7;G0;0;0;00.00;00.00	set.motorCoupled.124;0	set.discountDays2;0
tf.8;G0;0;0;00.00;00.00	set.motorCoupled.126;0	set.discountDaysReset;0
tf.9;G0;0;0;00.00;00.00	set.motorCoupled.128;0	set.discountMaxSel;0
tf.10;G0;0;0;00.00;00.00	set.motorCoupled.130;0	set.discountDoorClear;0
tf.11;G0;0;0;00.00;00.00	set.motorCoupled.132;0	set.Temperatura;0
tf.12;G0;0;0;00.00;00.00	set.motorCoupled.134;0	td.disable.0;0,0,0,0
tf.13;G0;0;0;00.00;00.00	set.motorCoupled.136;0	td.enable.0;0,0,0,0
tf.14;G0;0;0;00.00;00.00	set.motorCoupled.138;0	td.disable.1;0,0,0,0
tf.15;G0;0;0;00.00;00.00	set.motorCoupled.140;0	td.enable.1;0,0,0,0
tf.16;G0;0;0;00.00;00.00	set.motorCoupled.142;0	td.disable.2;0,0,0,0
tf.17;G0;0;0;00.00;00.00	set.motorCoupled.144;0	td.enable.2;0,0,0,0
tf.18;G0;0;0;00.00;00.00	set.motorCoupled.146;0	td.disable.3;0,0,0,0
tf.19;G0;0;0;00.00;00.00	set.motorCoupled.148;0	td.enable.3;0,0,0,0
tf.20;G0;0;0;00.00;00.00	set.motorCoupled.150;0	td.disable.4;0,0,0,0
tf.21;G0;0;0;00.00;00.00	set.motorCoupled.152;0	td.enable.4;0,0,0,0
tf.22;G0;0;0;00.00;00.00	set.motorCoupled.154;0	td.disable.5;0,0,0,0
tf.23;G0;0;0;00.00;00.00	set.motorCoupled.156;0	td.enable.5;0,0,0,0
tf.24;G0;0;0;00.00;00.00	set.motorCoupled.158;0	td.disable.6;0,0,0,0
tf.25;G0;0;0;00.00;00.00	set.motorCoupled.160;0	td.enable.6;0,0,0,0
tf.26;G0;0;0;00.00;00.00	set.motorCoupled.162;0	td.disable.7;0,0,0,0
tf.27;G0;0;0;00.00;00.00	set.motorCoupled.164;0	td.enable.7;0,0,0,0
tf.28;G0;0;0;00.00;00.00	set.motorCoupled.166;0	td.disable.8;0,0,0,0
tf.29;G0;0;0;00.00;00.00	set.motorCoupled.168;0	td.enable.8;0,0,0,0
tf.30;G0;0;0;00.00;00.00	set.motorCoupled.170;0	td.disable.9;0,0,0,0
tf.31;G0;0;0;00.00;00.00	set.motorCoupled.172;0	td.enable.9;0,0,0,0
tf.32;G0;0;0;00.00;00.00	set.motorCoupled.174;0	set.ledOnTimeOut;0
tf.33;G0;0;0;00.00;00.00	set.motorCoupled.176;0	set.flashingLedOn;0
tf.34;G0;0;0;00.00;00.00	set.motorCoupled.178;0	set.flashingLedOff;0

3. Firmware download

- Used to dowloand on UCB a new firmware

Command structure

STXload?CR/LF

Reply

CR/LF

After receiving the **CR/LF** UCB waits for programming file records, in Intel .hex format

The download software has to send one record and wait for confirmation from UCB (**CR/LF**)

To close the programming the download software has to send the "!" (0x21) character.

When receiving the "!" character, the UCB will check the received file check-sum, and if ok the UCB is restarted and the new firmware is running.

If the check-sum is invalid, the UCB will send **NACK (0x15) CR/LF** and to restart a new download is necessary to send a new command "LOAD?".

Example :

PC > **STX load? CR/LF**

UCB > **CR/LF**

PC > :**1080E000525352363431202030313030D0B4ADF5D7 CR/LF**

UCB > **CR/LF**

PC > :**020000040000FACR/LF**

UCB > **CR/LF**

.....

PC > !

(UCB will check the received file, and if OK will restart)

Important: this command is present in the 7.5.H revision and following; before using it check the firmware revision!

If the serial download is interrupted/stopped, to restart a new download it is necessary to send newly the command "LOAD?".

Command structure

STXboot status?CR/LF

Reply

STXboot status x CR/LF

x represents the bootloader status and can assumes these values:

- **0: the fw has been loaded correctly,**
- **1: the bootloader can't open the mmc file**
- **2: the mmc file has a wrong format,**
- **3: the download fw has a wrong dimension,**
- **4: the fw checksum is wrong,**
- **99: the same fw is already loaded**
- **165: serial download request**
- **166: serial download started**

This command is used to check if the download has had success and the boot-loader is jumped to the UCB application and run it. If the response is the machine status

STX status;<status_word>;<credit>;<optional status1>;<optional status2>;<optional status2>; CR/LF

the UCB fw is correctly installed; if the response is one of the status shown above, a malfunction is happened.

Important: this command is present only in the bootloader revision 0007 and following; before using it check the bootloader revision!