

QUINTA CONTROL PROTOCOL V2.0

CU communication channels

- Serial COM port (RS232) - 57600 baud (8Bits, no Parity, 1 Stop)
- USB – will be recognized as virtual COM port, settings like above
- TCP/IP telnet - port 23, default IP: 192.168.1.55, DHCP active

Data format and communication concept

All communication uses ASCII characters. The individual commands are based on single ASCII characters, followed by parameters and values.

- Command character (case sensitive)
- Parameters and values are separated by ASCII-blank characters (0x20). Numeric values are given in hex-format (not case sensitive)
- Each command must end with ASCII 0x0D (carriage return)

After receiving a valid command from controller, the CU will reply with the prompt “>” to signal that it is ready for the next command. The controller may not send another command to CU before receiving the “>” message from the previous command. The only circumstance you are allowed to send a command without “>” acknowledgement is due to timeout (“>” not received after 5 seconds since last command sent to CU).

Important:

Please note, to start with communication on one of the ports you must always initially send the ‘U 0’ command (including the password if applicable) to start communication on the port you would like to use (it doesn’t matter if you are using Serial, USB or Ethernet connection). After that you can communicate only on that port as long as you do not “Login” on Quinta on another communication port. If you are not logged in, you get the response “System locked”.

Example:

ASCII-View

```
15:40:47.97 [TX] - U 0<CR>
15:40:47.99 [RX] - <CR><LF>
>

15:40:49.34 [TX] - V a<CR>
15:40:49.36 [RX] - <CR><LF>
CUFW V1.2.00<CR><LF>
DARRFW V36<CR><LF>
WEB V02.00.00<CR><LF>
<CR><LF>
IP=10.49.10.136<CR><LF>
MAC=00:22:BB:30:00:41<CR><LF>
>
```

Hex-View

```
15:40:47.97 [TX] - 55 20 30 0D
15:40:47.99 [RX] - 0D 0A 3E

15:40:49.34 [TX] - 56 20 61 0D
15:40:49.36 [RX] - 0D 0A 43 55 46 57
20 56 31 2E 32 2E 30 30 0D 0A 44 41
52 52 46 57 20 56 33 36 0D 0A 57 45
42 20 56 30 32 2E 30 30 2E 30 30 0D
0A 0D 0A 49 50 3D 31 30 2E 34 39 2E
31 30 2E 31 33 36 0D 0A 4D 41 43 3D
30 30 3A 32 32 3A 42 42 3A 33 30 3A
30 30 3A 34 31 0D 0A 3E
```

History:

Version	Changes	Author
V1.0	<ul style="list-style-type: none"> Release of Document 	GF
V1.1	<ul style="list-style-type: none"> Sorting Parameters 	MF
V1.2	<ul style="list-style-type: none"> Adding '~Q 00' command (Clears all registered and speaking MUs) 	GF, MF
V1.3	<ul style="list-style-type: none"> Changing '~Q 00' command description to "Clear all registered MUs" 	PE
V1.4	<ul style="list-style-type: none"> Changing some information of 'i' and 'q' command Adding additional information on how to use '~Q 00' command on double delegate stations. 	PE
V1.5	<ul style="list-style-type: none"> Adding History and List of Content Correcting 'A' command description Adding description of stream information to command 'Q' Changing name of '~Q 00' to '~Q _0' command, because it can be used as '~Q 10' also Changing format of command 'c' example Adding 'a' command and description for it 	MF
V1.6	<ul style="list-style-type: none"> Did some layout changes 	MF
V1.7	<ul style="list-style-type: none"> Description update x command (section DARR/PnP version) Description update V A command (additional Note regarding the version numbering) 	PE
V1.8	<ul style="list-style-type: none"> Additional details for the "U 0" - command 	PE
V2.0	<ul style="list-style-type: none"> Corrected baud rate, protocol changes for Quinta update 09/2013 Added communication examples Improved explanations Added new commands for Quinta CU Core Version 1.2.00 or higher 	PE

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2 General Commands

2.1 “U” command - Communication channel unlock

Direction: Controller → CU

Format:

- U 0** – unlock current communication channel if no password is set (factory default);
- U 0 psw** – unlock current communication channel;
- U 1 npsw** – change password and save it to EEPROM;
- U B** - lock all the communication channels;

psw – current password (max. 15 ASCII characters); empty, if no psw is set (factory default)

npsw – new password (max. 15 ASCII characters)

Note:

"U 1 npsw" will be executed only after unlocking the current channel.

Same Password as in the Quinta PC-Software, Menu-Button → Startup Settings → Set Password

```

ASCII-View
08:36:43.94 [TX] - V A<CR>
08:36:43.95 [RX] - <CR><LF>
System locked<CR><LF>
>

08:36:46.24 [TX] - U 0<CR>
08:36:46.24 [RX] - <CR><LF>
>

08:36:49.07 [TX] - V A<CR>
08:36:49.07 [RX] - <CR><LF>
CUFW V1.2.00<CR><LF>
DARRFW V36<CR><LF>
WEB V02.00.00<CR><LF>
<CR><LF>
IP=10.49.10.136<CR><LF>
MAC=00:22:BB:30:00:41<CR><LF>
>
    
```

Commands will be accepted after an unlock command

2.2 “~^d” command – Remote Power-Off MUs

Direction: Controller → CU → MU

Format:

- ~^d** – power-off all MUs

```

ASCII-View
08:34:07.39 [TX] - ~^d<CR>
08:34:07.39 [RX] - <CR><LF>
>
    
```

```

HEX-View
08:34:07.39 [TX] - 7E 5E 64 0D
08:34:07.39 [RX] - 0D 0A 3E
    
```

2.3 “V” command - Show version and Configuration info

Direction: Controller → CU

Format:

V – show version number of the firmware;

V A – show all version numbers and configuration (IP, MAC);

Note:

The response contain a version information like: “DARRFW V36”. DARRFW is a identical to the PnP Version (Qunita Software) with the slight difference that the PnP additionally reports a preceding ‘1.’

```

ASCII-View
08:36:49.07 [TX] - V A<CR>
08:36:49.07 [RX] - <CR><LF>
CUFW V1.2.00<CR><LF>
DARRFW V36<CR><LF>
WEB V02.00.00<CR><LF>
<CR><LF>
IP=10.49.10.136<CR><LF>
MAC=00:22:BB:30:00:41<CR><LF>
>
  
```

2.4 “x” command - MU information message

Direction: MU → CU → Controller

Format:

x muad m f v

```

|          | | |
|          | | +-----> Versions
|          | +-----> MU status (Bat. level, RF level & Charger status)
|          +-----> MU Flags
+-----> command code "x"
  
```

muad - source MU ID - [min 1 / max FFFFFFF]

m - MU flags - [min 0000 / max FFFF]

FEDCBA9876543210 <- m bits

```

|||||
|||||++++-----> Allocation mode
|||||+++-----> MU Zone (0x0..0x3)
|||||+-----> Request to stop flag*
||||++++-----> HWType
|||+-----> Speaking left*
||+-----> Request to speak left*
|+-----> Speaking right*
+-----> Request to speak right*
  
```

* - service flags/not to be used

Note: Zone 0x0..0x3 corresponds to the zone 0x1..0x4 in the “A” command

Allocation mode

```

0x0 - Single Delegate (SDel)
0x1 - Double Delegate (DDelL, DDelR)
0x2 - Chairman(Chrm)
0x3 - Listener(Lstn)

```

Hardware Type (*Core version 1.2.00 or higher*)

```

HWType  Name
0        Single MU 1btn
1        Double MU 2btn
2        Chairman MU 3btn
3        Revoluto MU 1btn
4        Revoluto MU 3btn
5        Reserved
6        Reserved
7        Reserved
8        Reserved
9        Reserved/Test MU
>9       Generic MU

```

f - status

```

76543210 <- Status bits
|||||
|||||+++-----> BatLevel
|||++-----> RFLevel
||+-----> Charger on/off
|+-----> Charger error
+-----> N.U.

```

```

BatLevel
4 - 100%
3 - 80%
2 - 60%
1 - 40%
0 - 20%

```

v - versions

```

111111110000000000000000
76543210FEDCBA9876543210 <- v bits
|||||
|||||+++++----> FW build
|||||++++-----> FW revision
|||||++++-----> FW version
+++++-----> PnP version (without preceding '1.')
```

Note:

The message is sent periodically (about every 20 seconds) by MUs to CU.

Example: ASCII-View

```

09:39:18.39 [RX] - <CR><LF>
x 00021E 0131 7A 241100<CR><LF>
>

```

x = Command MU information
00021E = muad in hex → MU-ID = 542
0131 = HW-type: Dbl.Delegate
Zone 0x3 (corresponds to zone 4 in Quinta PC-software)
Allocation Mode (Function): Dbl-Delegate
7A = Batt Status 60%, best RF quality, charger off, no error
241100 = PnP Version: 0x24 = 36_{dec} → 1.36. FW-version 1.1.00

3 Configuration Commands

3.1 “J” commands - System Configuration

Direction: Controller → CU

Format:

- J -** shows: PC Control Status, PIN Status, NOM Status, Last Mic. Hold Status and Manuel RF-Channel Selection Status
- J 1 m -** change PC Control Mode (m: 0 = Stand-Alone/1 = PC Control)
- J 4 m -** change PIN State (m: 0 = Disable/1 = Enable)
- J 5 m -** change NOM override State m: (0 = Disable/1 = Enable)
- J 6 n -** change NOM (n: 1 – 4)
- J 8 n -** change RF Mode (n: 0 = Auto/1 = Manuel, fix RF-channel)
- J 9 n -** change global NOM (n: 0 = use NOM in allocation/1 = NOM globally disabled)
- J A n -** change Speak/Allocation Mode (n: 0 = Toggle / 1 = Push To Talk / 3 = Voice activation)
- J B n -** change MU Button Power Off (n: 0 = deactivate MU Button Power Off / 1 = activate MU Button Power Off)
- J C n -** change Priority Mode (n: see below)
- J 10 v -** change Last Mic. Hold (v: 0 = Last Mic. Hold disabled / 1 = Last Mic. Hold enabled)
- J 11 c -** change Manuel RF Channel (n: see below)

Controls:

Priority Modes:

- 0 - Normal (Toggle)
- 1 - Mute (Toggle)
- 2 - Clear Prio.
- 3 - Mute Aux IN (Toggle)
- 4 - Mute Aux In & Clear (Toggle)
- 5 - Mute Aux Out (Toggle)
- 6 - Com. Message send
- 7 - Custom strings

Manuel RF-Channel Selection:

- 0 - 2.4 GHz Low
- 1 - 2.4 GHz Mid
- 2 - 2.4 GHz High
- 3 - 5.2 GHz Low
- 4 - 5.2 GHz Mid
- 5 - 5.2 GHz High
- 6 - 5.8 GHz Low
- 7 - 5.8 GHz Mid
- 8 - 5.8 GHz High

Example: ASCII-View

```
09:56:15.08 [TX] - J<CR>
09:56:15.08 [RX] - <CR><LF>
Stand-alone<CR><LF>
SPK_MODE=00<CR><LF>
<CR><LF>
LPKenabled<CR><LF>
PIN off<CR><LF>
NOMdisabled3<CR><LF>
<CR><LF>
OVRdisabled<CR><LF>
LMHdisabled<CR><LF>
AudioHD<CR><LF>
MRFC=1 (auto)<CR><LF>
ZoneFlag=0><CR><LF>
<CR><LF>
>
```

3.2 “j” command - “Room Combining” configuration

Direction: Controller → CU

Configuring CU

Format:

j C - show active Rooms, here referred as Cell ID
j C 2 v - change room combining

```
v - Rooms (Cell ID)
76543210 <- bit in v
|||||
|||||+-----> Rooms
|||||+-----> A (0 active / 1 inactive)
|||||+-----> B (0 active / 1 inactive)
|||||+-----> C (0 active / 1 inactive)
||||+-----> D (0 active / 1 inactive)
++++-----> Unused
```

j C generates a reply of type: Cell_ID=v

Example: ASCII-View

```
09:57:46.20 [TX] - j C<CR>
09:57:46.22 [RX] - <CR><LF>
Cell_ID=0x07
Cell_ID_Mask=0x00<CR><LF>
>
```

Configuring MU side

Direction: Controller → CU → MU

Format:

~j C 2 v - configure all MUs in range with this ROOM (Cell ID)

```
v - Cell ID
Room v-value
A 77
B BB
C DD
D EE
```

Example: ASCII-View

```
10:06:07.86 [TX] - ~j C 2 77<CR>
10:06:07.87 [RX] - <CR><LF>
>
```


3.3 “S” command - Display / modify CU allocation table

Direction: Controller → CU

Format:

- S 0** – display the allocation table
- S C** – display stream C status
- S D** - display stream D status
- S E** - display stream E status
- S F** - display stream F status
- S C v** - change stream C status
- S D v** - change stream D status
- S E v** - change stream E status
- S F v** - change stream F status

```
v
76543210 <- "v" bits
|||||||
|||||||+-----> stream activated/deactivated
|||||||+-----> chairman reserved
+++++-----> N.U.
```

Answer format:

StrX muad FLAGS MUFlags

FLAGS

```
76543210 <-- FLAGS bits
|||||||
|||||||+-----> stream activated/deactivated
|||||||+-----> stream left - allocated/free
|||||||+-----> stream right - allocated/free
||||+-----> stream timer on/off
|||+-----> stream timer overflow
||+-----> stream reserved for chairman
|+-----> MuteStatus (Stream muted in priority mode 1)
+-----> N.U.
```

MUFlags

```
76543210 <- MUFlags bits
|||||||
|||||+++-----> Allocation mode
|||+-----> Flag left/right (only for double delegate)
|+++-----> Zone
+-----> N.U.
```

Allocation mode

- 0x0 - Single Delegate (SDel)
- 0x1 - Double Delegate (DDelL, DDelR)
- 0x2 - Chairman(Chrm)

Example: ASCII-View

```
09:38:29.92 [TX] - S 0<CR>
09:38:29.92 [RX] - <CR><LF>
StrC 000000 01 00<CR><LF>
StrD 000000 01 00<CR><LF>
StrE 000000 01 00<CR><LF>
StrF 000000 01 00<CR><LF>
>
```

3.4 “s” commands - Show / change custom string for Priority mode 7

Direction: Controller → CU

Format:

- s – show custom strings
- s 0 str - change str & save it to Custom_String0
- s 1 str - change str & save it to Custom_String1

Note:

str - max. 15 ASCII characters

Example: ASCII-View

```
10:30:14.35 [RX] - <CR><LF>
CS0:CUSTOM STRING 0<CR><LF>
CS1:CUSTOM STRING 1<CR><LF>
>
```

3.5 “c” commands - Ethernet TCP/IP configuration

Direction: Controller → CU

Format:

- c - read MAC, IP, Subnet mask, Gateway and DHCP Status (Enabled/Disabled)
- c 2 a – change IP: a = IP address
- c 3 a - change Subnet mask
- c 4 a - change Gateway address
- c 5 f - change DHCPEn (f=0 DHCP disabled, f=1 DHCP enabled)
- c 6 0x1422 - apply & save to SPI flash the new configuration

IP address must be provided in hex-format based on ASCII characters (8 ASCII characters = 4 bytes in hex format)

Example:

For setting IP=192.168.1.55 the following command should be used:

```
c 2 3701A8C0
| | | | | | | |
| | | | | | | |++--> 0xC0=192
| | | | | | | |++----> 0xA8=168
| | | | | | | |++-----> 0x01=1
| | | | | | | |++-----> 0x37=55
```

ASCII-View

```
08:32:32.89 [TX] - c 2 3701A8C0<CR>
08:32:32.89 [RX] - <CR><LF>
>

08:32:37.32 [TX] - c<CR>
08:32:37.33 [RX] - <CR><LF>
MAC=00:22:BB:30:00:41<CR><LF>
IP=192.168.1.55<CR><LF>
IPMASK=255.255.0.0<CR><LF>
GTW=10.49.0.254<CR><LF>
DHCPEn=1<CR><LF>
>
```


Example: ASCII-View

```
09:03:41.15 [TX] - A 0000021E 1 0139<CR>
```

```
09:03:41.17 [RX] - <CR><LF>
```

```
Q 0000021E 11 0C<CR><LF>
```

```
>
```

A = Command MU start/stop Speaking
 0000021E = muad in hex → MU-ID = 542
 1 = start speaking
 0139 = Hardware type: MU22 (Dbl. Delegate)
 Zone 3
 Allocation type: Dbl Del – right button

Q 0000021E 11 0C → see „Q command“

Note:

This command works only while PC control mode is activated (see “J” command, **PCCtrl=1**). Core Version 1.2.00 will also accept old format style commands. In this case it will assume the hardware type “Single MU”.

4.2 “i” command - Clear all speaking MUs

Direction: Controller → CU → MU

Format:

i 00

Note:

This command will not clear the request to speak status of MUs (see ~Q 00), this command clears only open mics.

4.3 “i” command - Chairman “Clear” message

This message will be received from CU after a chairman had pressed his “Clear” button.

Direction: MU → CU → Controller

Format:

i 00 - clear

Example: ASCII-View

```
10:21:48.39 [RX] - <CR><LF>
```

```
i 00<CR><LF>
```

```
m<CR><LF>
```

```
>
```


Example: ASCII-View

```
09:24:36.68 [RX] - <CR><LF>
q 0000021E 01 0139<CR><LF>
a 0000021E 01 0139<CR><LF>
>
```

Q = Command MU speak request
0000021E = muad in hex → MU-ID = 542
01 = start speaking
0139 = Hardware type: MU22 (Dbl. Delegate)
Zone 3
Allocation type: Dbl Del – right button

a 0000021E 01 0139 → see „a“command

Note:

The “q” command might be sent by the MU several times after one mic button press for redundancy reasons.

This command works only while PC control mode is activated (see “J” command, **PCCtrl=1**).

4.5 “a” command – MU Request to Speak

Direction: MU → CU → Controller

Same as “q” command – MU Request to Speak, needed for internal reasons.

4.6 “Q” command – MU Allocation/De-allocation on a Stream

Direction: CU → Controller

Format:

Q muad m s - right/left or single delegate, allocated/de-allocated to/from a specific Stream.

muad – MU ID - [min 1 / max 00FFFFFF]

m

76543210 <- bit in m

|||||

|||||+----> allocated/de-allocated (1=allocated)

||||+----> N.U.

|||+-----> right/left or single delegate (1=right)

+++-----> N.U.

s - allocation stream

0C: MU allocated on stream 1

0D: MU allocated on stream 2

0E: MU allocated on stream 3

0F: MU allocated on stream 4

Note:

Command is generated by CU when a MU Allocation/De-allocation event occurs.

Example: ASCII-View

```
09:33:56.10 [RX] - <CR><LF>
```

```
q 000021E 01 0139<CR><LF>
```

```
Q 000021E 11 0C<CR><LF>
```

```
>
```

```
09:33:57.23 [RX] - <CR><LF>
```

```
q 000021E 00 0139<CR><LF>
```

```
Q 000021E 10 0C<CR><LF>
```

```
>
```

q = Command MU speak request

Q = Command stream allocation

000021E = muad in hex → MU-ID = 542

11 = Dlb. Del. right btn.– stream allocated

0C = Stream 1

4.7 “~Q” command - Clear speak request on MUs

Direction: Controller → CU → MU

Format:

~Q 00 clears Single Delegate and Double Delegate left button speak requests

~Q 10 clears Double Delegate right button speak requests

Note:

This command works only while PC control mode is activated (see “J” command, **PCCtrl=1**).

For clearing all MUs which are in speaking mode (mic on) or speak request mode send:

i 00

~Q 00

~Q 10

4.8 “I” command – Chairman “Priority” message

This message will be received from CU after a chairman had pressed his “Func” button.

Direction: MU → CU → Controller

Format:

I 00

Example: ASCII-View

```
10:23:54.39 [RX] - <CR><LF>
I 00<CR><LF>
PrioMode=1<CR><LF>
Prio on<CR><LF>
><CR><LF>
```

```
10:23:56.60 [RX] - <CR><LF>
I 00<CR><LF>
PrioMode=1<CR><LF>
Prio off<CR><LF>
>
```

4.9 “~p” command - MU ping and speaking warning time

Direction: Controller → CU → MU

Format:

~p muad - ping LED Mic

~p muad m - activate/deactivate Warning Time Speaking (WTS)

muad – MU ID - [min 1 / max 00FFFFFF]

m:

0 - stop WTS signaling;

1 - WTS signaling simple delegate or double delegate left

2 - WTS signaling double delegate right

3 - WTS signaling double delegate left & right

Example: ASCII-View

```
10:27:38.37 [TX] - ~p 0000021E<CR>
10:27:38.38 [RX] - <CR><LF>
>
```


5 Commands for internal Audio Control

5.1 “P” commands - DSP (Control Unit Audio Configuration)

Direction: Controller → CU → DSP

Format:

P r – DSP read

CU will reply to the read command with **DSP[c]=0x...**

P r v – DSP write

r – DSP register address to read from/write to. ASCII hex byte – [min 0F / max FF]

v – Register value; ASCII hex byte – [min 00 / max FF]

Note:

Please refer to the DSP register list provided in a separate document.

Example:

Read register 0x10 (Volume Master):

Controller -> CU: P 10 (read Master Volume Value)

CU -> Controller: DSP[10]=0x0C (0x0C=12_d → 12dB attenuation, unmute)

CU -> Controller: >

Write register 0x10 (Volume Master)

Controller -> CU: P 10 00 (set DSP Volume Master to 0dB, unmute)

CU -> Controller: DSP[10]=0x00

CU -> Controller: >

ASCII-View

```
08:25:05.83 [TX] - P 10 0C<CR>
```

```
08:25:05.83 [RX] - <CR><LF>
```

```
>
```

```
08:25:22.90 [TX] - P 10<CR>
```

```
08:25:22.90 [RX] - <CR><LF>
```

```
DSP[10]=0x0C<CR><LF>
```

```
>
```

5.2 “b” commands - AVB network related configuration

Direction: Controller → CU → AVB

Format:

b c n – AVB read command

CU will reply the read command with **AVB[c]=0x...**

b c n x

or

b c n x y – AVB write command

c – AVB register address to read from/write to. ASCII hex byte – [min 00 / max FF]

n – Number of bytes to read or write from AVB register. ASCII hex byte – [min 00 / max 08]
maximum 8 bytes can be written to AVB on a single command

x – Byte 1..4 to be written to AVB register: DWORD – [min 00 / max FFFFFFFF]

y – Byte 5..8 to be written to AVB register: DWORD – [min 00 / max FFFFFFFF]
will be used only if “n”>4

Note:

Please refer to the AVB register list provided in a separate document.

Example:

Read register:

Controller -> CU:

b 10 4 (AVB read command: “10” AVB register for AVB-IP address; “4” read four bytes).

CU -> Controller:

AVB[10]=0xC0A80104 (0xC0=192_d; 0xA8=168_d; 0x01=1_d; 0x04=4_d; → IP-Address: 192.168.1.4)

CU -> Controller:

>

Write register:

Controller -> CU: b 10 4 C0A80104 (AVB write command 0x10 with the following bytes as parameters 0xC0, 0xA8, 0x01, 0x04 → IP-address: 192.168.1.4)

ASCII-View

```
08:29:08.92 [TX] - b 10 4 C0A80138<CR>
08:29:08.92 [RX] - <CR><LF>
>

08:29:09.78 [TX] - b 10 4<CR>
08:29:09.79 [RX] - <CR><LF>
AVB[10]=0xC0A80138<CR><LF>
>
```