Mlhcl\ bb QMBox10:

QMBox10-16, QMBox10-32, QMBox10-48, QMBox10-128

Bglmdpby ih wdlemlpbb .

\baby 2.2.

Dhgl d l u :

http://www.R-Technology.ru

Info@R-Technology.ru - Hsb \h ihu

Sales@R-Technology.ru - Hle ih

Support@R-Technology.ru - Logbdy ihd

1. Hsb \gby .

Mhcl\ bb QMBox10 i lteyxl h hc fghh dgevgu :Pl , ihde x fu d dhfivxl m ih rbg USB 2.0. a\bbf hlb hl fheb hgb fhml bfl v hl 16 h 128 bnngpbevgu o gehh\uo \ohh\ beb hl 32 h 256 \ohh\ h sc afec .

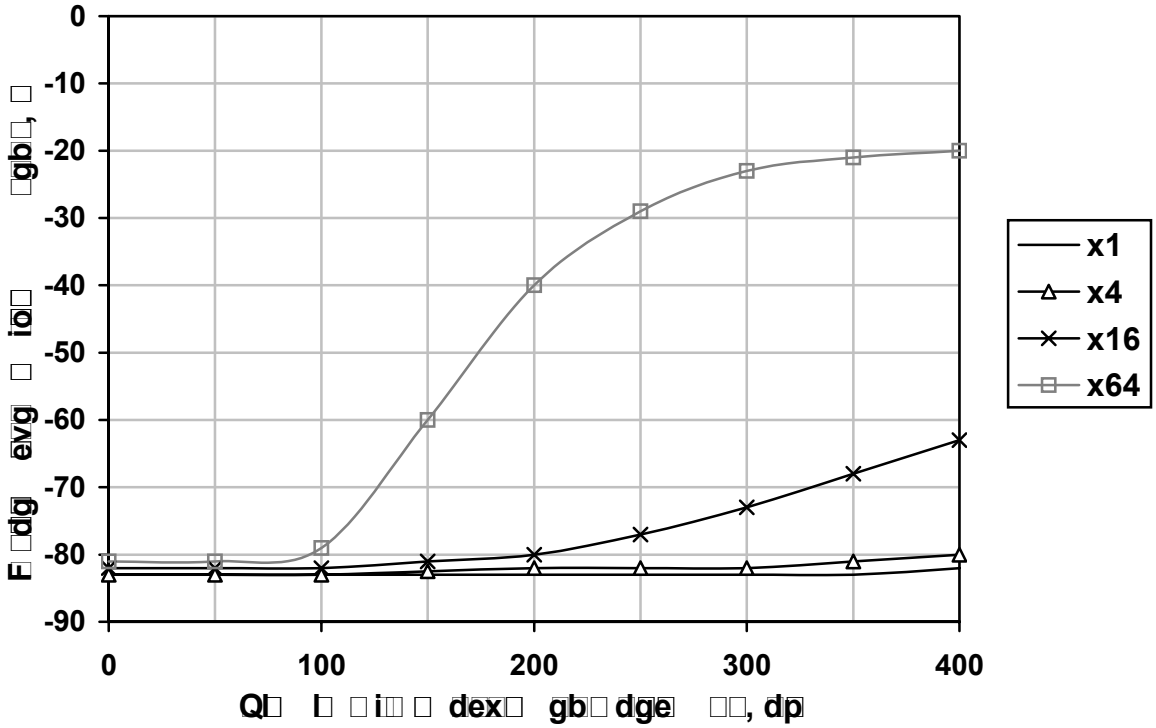
Mhcl\ bb QMBox10 fhml bihevah \lvy dd fghhdgevgu hpbeehnu , idlhgebalhu , ld i hegh pggu wedlhggu fhibpu -blhhu \hafhghl vx h og gby gguo g ldhf bd dhfivxl a au\h\ b hgbgbc ih \fgb aibb .

lbfm s l

- F bgbfev gh hhlghrgb «lhbfhlv /dhebl\h dg eh\» ib hl ebgu o flhehbdbo \hc l\o ;
- Gebb bf «hsc afec » iha\heyl m\hbl v beh baf blevguo dgeh\ mhcl\ ey ibfggbc , g l mxsbo bnngpbevghh ih dexgby blhgbdh \ bge ;
- hafhgh l v hgh\ fgghh h , hhldb , \ba m ebapbb b hoggby gguo a au\h\ \ lgb g hgbgghh \fgb ;
- ohys \ dhfiedl ihl\db i hffgh hlgb ey dhfivxl (ihblxly HK Windows XP b gh\ ) iha\heyl :
  - iblmiblv dhl mhcl\hf am ihe ihdex gby, a i\bl evguo mbh\db b ihffbh\gby ;
  - hlu\lv , \bame babh\l v b hogyl v ggu g ldbc bd dhfivxl \ evgh f \fgb .

2. Technical data

Item	QMBox10-16	QMBox10-32	QMBox10-48	QMBox10-128
Number of inputs (balanced / unbalanced)	**16/32**	**32/64**	**48/96**	**64/128 - 128/256**
Digital audio interface				
Dimensions, mm	140x190x40	140x190x60	140x190x80	260x260x160
Clock accuracy	±10 ppm, ±2.5 ppm, ±0.625 ppm, ±0.156 ppm, depending on the selected mode			
Power consumption (without USB devices), W	**0.4**	**0.8**	**1.2**	**1.6 - 3.2**
Power supply	400 mA			
Weight, kg	14 kg			
Frequency response	0.7 Hz - 22 kHz (-3 dB, ±2.5 dB)			
THD+N	0.05 % (typ.)			
Channel separation (at 1 kHz)	-75 dB (typ.)			
Channel separation (at 20 kHz)	-83 dB (typ.)			
Absolute phase: - Left channel - Right channel	±15 ° ±50 °			
Connection	USB 2.0			
Power	100-240 V, 50/60 Hz, 24 W			
Operating temperature	+5° to +55° at relative humidity 5% to 90%			



A\ b□bfhl□ v f□ dg e vg□□□i□ o□□gb□ l□ □ l□ l□ u idle x□ gb□dg □e□ b d□n n bpbg l□
m beglb□ ge□ □□ l□ dl□

3. Obzor modulej.

Novye moduli QMBox10 – 16-kanal'nye platy serii **QMS10**, kotorye mogut ustanavlivat'sya v odno ili dva gnezda. Moduli QMBox10 imeyut vozmozhnost' ustanovki 1-, 2-, 3- i 8-kanal'nyh blokov, a takzhe razlichnye varianty ispolnenij, kotorye otlichayutsya drug ot druga po sposobu podklyucheniya datchikov:

Gabarity	**QMBox10-16**	**QMBox10-32**	**QMBox10-48**	**QMBox10-128**
Dopustimoe kolichestvo modulej serii QMS10	**1**	**2**	**3**	**4 – 8**
Dopustimoe kolichestvo kanalov vvoda / vyvoda.	16/32	32/64	48/96	64/128 – 128/256
Vysota, shirina, glubina	140x190x40	140x190x60	140x190x80	260x260x160

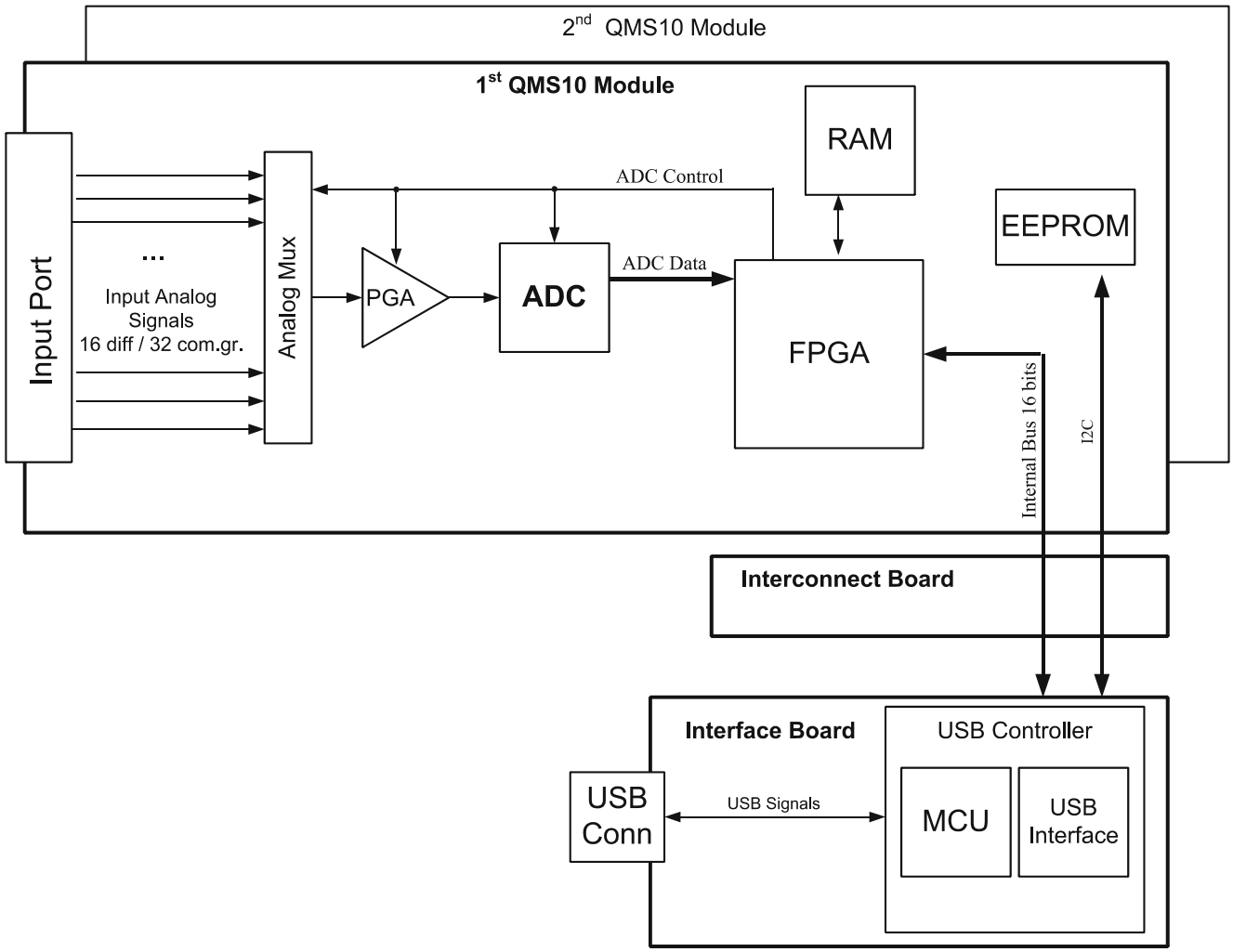
Gabarity korpusa QMBox10-32 pokazany na risunke:

A – kolichestvo modulej ; B – kolichestvo modulej v gnezde :
1 – vyklyuchatel' pitaniya.
2, 3 – gnezda dlya QMS10 – 2 sht.
4 – razem dlya podklyucheniya kabelya svyazi s kompyuterom po interfejsu USB
5 –Knopka vybora kanala dlya nastrojki parametrov datchika i kalibrovki.

Kazhdyj modul' QMS10 imeet svoj sobstvennyj nomer, kotoryj ustanavlivaetsya pri pomoshchi knopki vybora kanala i kalibrovki datchika. Nomer modulya ispol'zuetsya pri podklyuchenii k kompyuteru po interfejsu USB. Razem dlya podklyucheniya kabelya svyazi s kompyuterom po interfejsu USB.

Modul'naya masshtabiruemaya arhitektura serii QMBox pozvolyaet ob"edinyat' v odno ustrojstvo moduli raznyh tipov (ACP, CAP, diskretnogo vvoda-vyvoda), prichem v lyubyh kombinaciyah. Podrobno takie kombinirovannye ustrojstva opisany na stranice *http://www.r-technology.ru/products/automation/qmbox/index.php*

G□ bmgd□ gb□ ih dag□ mi□hsggy nmgdpbhg□evgy o f□ fheb QMBox10-32, hthysc ba 2o f hm e□c QMS10:



□ :

Input Port – \ohgh c atf fhme y.

Analog Mux – gehh\uc fmevl bied□ h□, igagg e y dhffml □pbb \ohguo gehh\uo bgeh\ .

PGA – ih□ ffbmf uc mbebl□ ev \oh□guo gehh\uo bgeh\ .

ADC – fbd□ hof□ :Pl .

FPGA – fbdhof □ lEBK , hbl pbnh\u□ ehbdb□ o fu . Hbl\ mi\egb□ \fb dhfihggIf b fhmey , □ ld□ \abfh□ cl\b□ f□m f hm e□f b BgInccghc ielhc mlhc\□ QMBox.

RAM – f bdhof□ HAM H□ ibl\ ihfmlh □gmx m n□b a pbx □ gguo i□ □ hlitdhc \ BgInccgmx ielm .

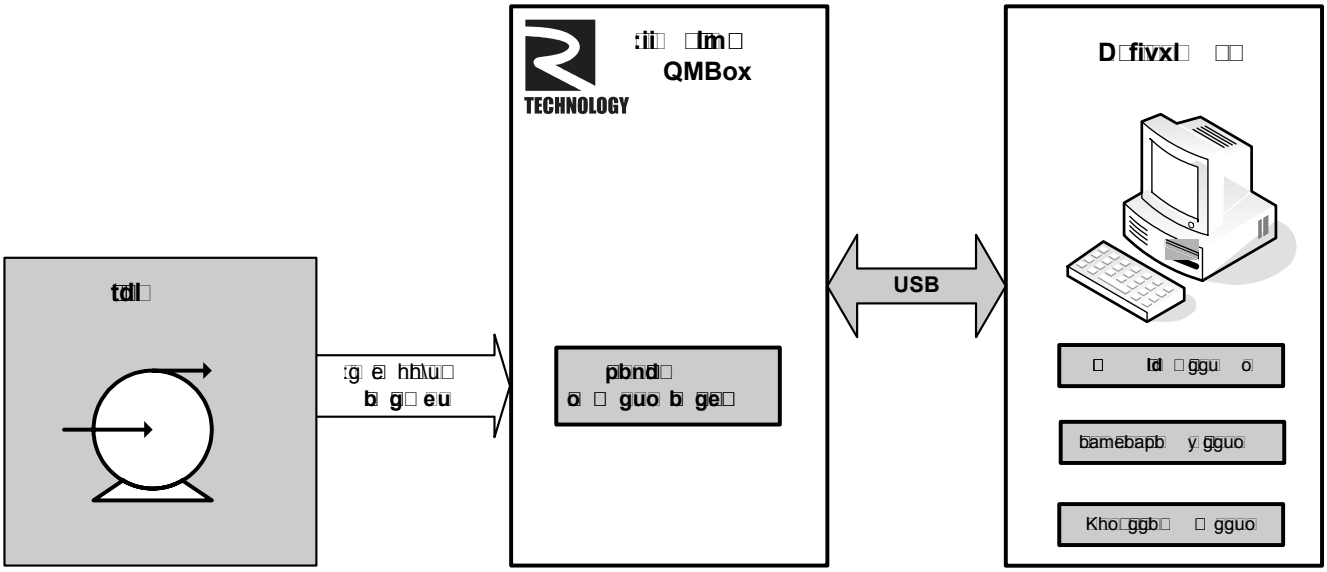
EEPROM – fbdhof □ lAM . Khbl emgm x bgn hfpbx – lbi b \□ bx fhme y, debh\hgu□ dhwnnbpbglu b l i.

Interconnect Board – hbgblevgy iel□ .

Interface Board – bgl□ ncgy iel□ .

4. Ibggpbi hlu .

Mlhcl\ bb QMBox10 hlxl ih mitegb f dhfivxl (HK Windows XP b he gh\u), d dhlhhfm ihde xxly ih rb g USB. Lhffgh hlgb , \ohys \ dhfiedl ihltdb mlhcl\ QMBox10, hmsl\eyl ihlhdh\uc \\h ggguo :Pl \ ify lv dhfivxl , bo h hldm b ihemxs mx \bamebapbx g wdg f hgblh , ld hoggb g ldbc bd dhfivxl :



l geehf hlu ihfhsv x ihffgh hl gby ih ba\hbly dhgnbmp by – axly ifl u hlu mlhcl\ : mlg \eb\ly lhl bdlbapbb , dhebl\h bihevamf uo dgeh\ , b l.[1]

lhe wlhh ihba\h bly aimd mlhcl\ , l. aimdly gihlggh g ib ggguo.

Mlhcl\h QMBox10 \ ihp g ib ggguo agghc dhhl vx hpbnh\ul \ohgu gehh\u bgeu b hlley ggu a bgl ncgmx ielm \ dhfivxl ih rbg USB. dhfivxl ggu ihfsxly \ dhevp\hc m n \ hlb\gh c ifylb . lh f alhegby wlhh mn ggu ba gh abl ibde gh ihffgh hlgb (lH) ey ihemxsc h hldb , \bamebapb b b hoggby g ldhf bd . lhdhe vdmlH a bl ggu ba mn h dhh lvx hevr c, f dh hlv bo ihlmie gby ba mlhcl\ , g ib ggguo fh l ihhelv y dhev mhgh heh , b ib wlhf ggu ba fhmec \\h ihlmixl \ dhfivxl a au\h\ . Ldbf hahf , mlhcl\h fhl ul v bihe vah\gh \ dl\ ihegh pgghh fhibp - bllh a hgbgbc ih \fgb a ibb .

lhfbfh hibgghh \ur ihlhdh\hh \\h ggguo , mlhcl\ bb QMBox10 fh ml hllv \ bf bgohgghh \\h . wlhf bf mlhcl\h hmsl\eyl hghdlgu

[1] Gh oh bfh mbl u\l v, lh hs y d h hlv hlu \ o bihevam fuo d g eh\ g fh l ulv ihba\he vgh \uhdhc . Gibf , ey mlhcl\ QMBox10-48 i f l «fd bfe vgy hs y d hhlv hpbnh\d b ggguo » = 1.2 Fwfi eh\ / d . (f . L ogb db o dl b lbd b.) Wlh agbl , lh fhgh bihevah\lv \ 48 d g eh\ ml hc l\ lhlhc bd lbapbb g he (1.2 / 48) = 25 d=p; beb 6 d g eh\ lhlhc g he (1.2 / 6) = 200 d=p; beb 3 d g e fdbfevgh \hafhghc lhlhc (1.2 / 3) = 400 d=p

6. Installation

6.1. Safety

Make sure the QMBox is placed on a flat surface and is not exposed to electrostatic discharge (ESD). Do not touch the electronics – risk of damaging the device by electrostatic discharge.

The QMBox must be installed by a qualified person who is familiar with the construction and operation of the device and the potential hazards involved. Observe the safety instructions in this manual.

Grounding the QMBox is mandatory!

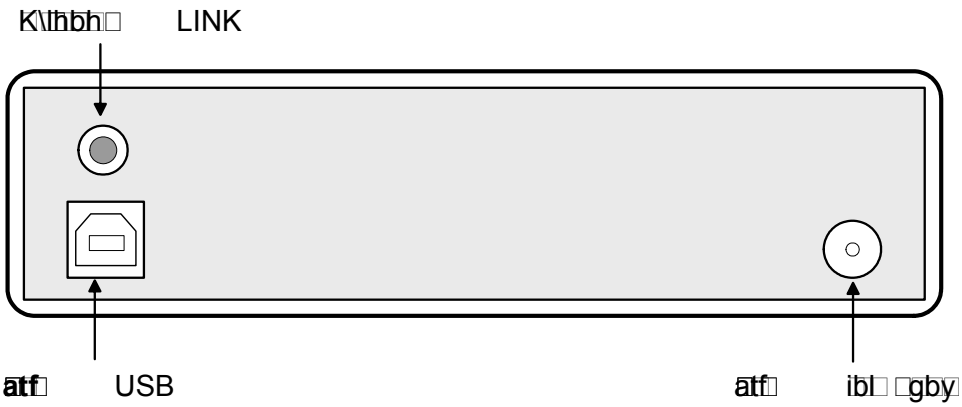
6.2. Software installation

For the correct operation of the QMBox and software, please follow the instructions below.

Insert the CD-ROM into your computer, open the installation folder and run **setup.exe**. The software will guide you through the installation process. When the installation is complete, connect the QMBox to your computer.

6.3. lhyhd ihdexgby b hldexgby mlhc l\ .

G bmgd ite \b ag c igeb mlhcl\ bb QMBox:



at f USB – lb i ;. Klgtguc atf ey ihde xgby mlhcl\ d dhfivxl mih rbg USB def lbi :-;.

K l b LINK – ahtvy ib ihdex gbb mlhcl\ d rbg USB b bgebab ml h lhf , lh USB-ihl dhf i vxl i \bevgh ihage mlhcl\h .

at f ibl gb – igag g ey ih b iblgby hl \grgh blhgbd ib lgb y, \ohysh \ dhfiedl ihl\db mlhcl\ .

lhyhd ihdexgby \o mlhcl\ bb QMBox ldh\ :

1. lhdexbl blhgb d iblgby , \ohysbc \ dhfiedl ih l\db mlhcl\ , d at fm iblgby ml hcl\ .
2. lhdexbl blhgbd iblgby d b ifggh lhd.
3. lhdexbl atf USB mlh c l\ QMBox d USB-ihlm dhfivxl ihfhsvx wdgbh \ ggh dey USB, \ohysh \ dhfiedl ihl\ db ml hcl\ . he g ahtvy K\hbh LINK. eb ibl evgh g dhfivxl ueh mlgh\egh ihffgh hlgb QMBox, hipbhggy blf heg \thfb db hihaglv mlhcl\h . bil ml hcl\ (Device Manager) hegh ih y\bl v y mlhcl\h \ mii R-Technology Devices, gibf :

eb c\u mlhcl\ g u eb i ble vgh mlgh\egu g dhfi vxl ,
beb ihbahre hc ib bo mlgh\d , bo fh gh mlgh\bl v \mgmx , f .
lbehgb :.

4. lhdexbl bihgbd b bgeh\ d mlhcl\m – f . i. lh dexgb dhtdlm .

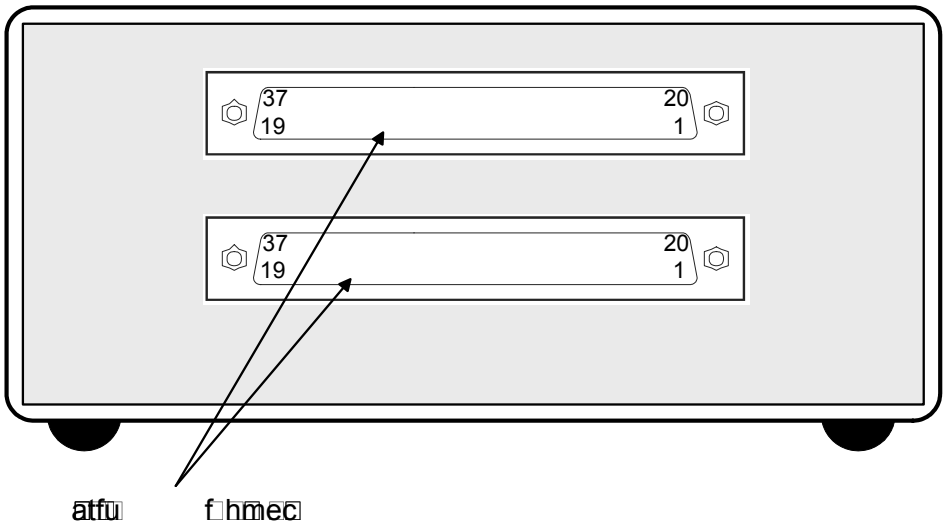
lhychd hldexgby mlhcl\ QMBox ldh\ :

1. Hlhbgbl htdl (blh gbdb bgeh\ ) hl mlhcl\ .
2. Hldex bl mlhcl\h hl dhfivxl .
3. Hlhbgbl bihgbd iblgby hl lb ifgghh lhd.
4. Hlhbgbl hl mlhcl\ blhg bd iblg by.

6.4. lhdexgb dhtdlm .

g bfg b !!! l bevg ihde xgb b lhgbdh \ gehh\hh bge — gbhe \gh meh\b dh dlghc h l u mlhcl\ h gguo , dhlh h iha\he y ba lv fghl\ ihef ib wd em l p bb mlhcl\ .

G emxsf bmgd itteg \b igc i geb mlhcl\ (fh ev QMBox10-32, hthy sy ba\mo fhme c QMS10):



atfu f hmec

Duc f hmev , \oh ysbc \ mlhcl\h QMBox10, bfl \hc hl\gguc \ohgh c atf ey ihdex gby bgeh\ :

ogc □ atf□ fhme y QMS10 hi b□□g \ emxsc l□ebp□ , □ :
l□ \ohh\ Xn – Yn – \oh□ n-gh□h bnngpbevghh dge□ ;
NC – dhgld l□g□ihdexly ;

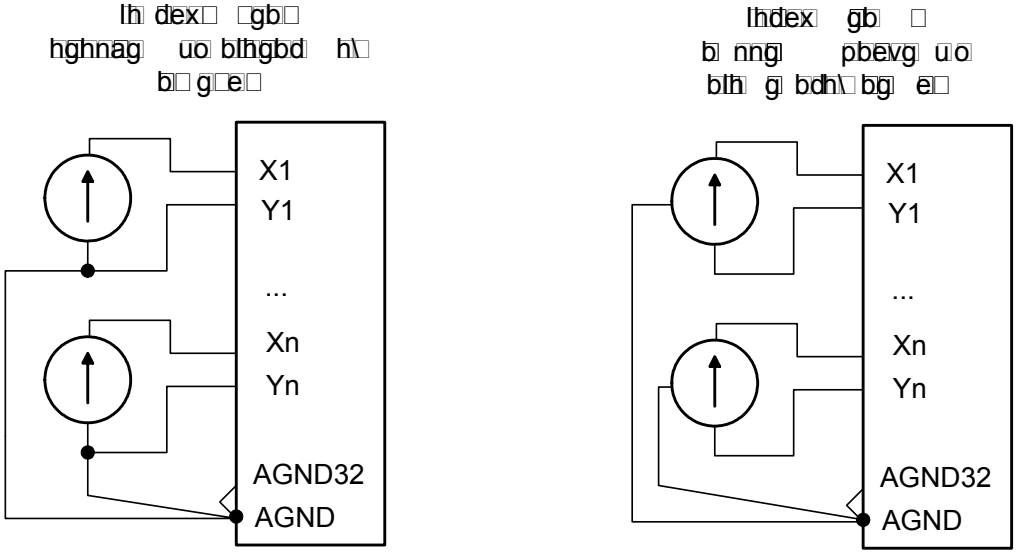
N ebgbb	Gag □ gb□	N ebgbb	Gag □ gb□
1	□oh□ **+12**□ (gehh\h□ ibl gb□)	20	**SYN** – \o h□ \grgc □bgohgbap bb[2]
2	□oh□ **-12**□ (gehh\h□ ibl gb□)	21	**AGND32** – gehh\y afey ey bf□ «□hsc afec »
3	**AGND** – gehh\y afey	22	\oh□ □16
4	\oh□ Y16	23	\oh□ □15
5	\oh□ Y15	24	\oh□ □14
6	\oh□ Y14	25	\oh□ □13
7	\oh□ Y13	26	\oh□ □12
8	\oh□ Y12	27	\oh□ □11
9	\oh□ Y11	28	\oh□ □10
10	\oh□ Y10	29	\oh□ □9
11	\oh□ Y9	30	\oh□ □8
12	\oh□ Y8	31	\oh□ □7
13	\oh□ Y7	32	\oh□ □6
14	\oh□ Y6	33	\oh□ □5
15	\oh□ Y5	34	\oh□ □4
16	\oh□ Y4	35	\oh□ □3
17	\oh□ Y3	36	\oh□ □2
18	\oh□ Y2	37	\oh□ □1
19	\oh□ Y1		

l□ ihdexgbb blh gbdh \ g□ ehh\hh bge□ ghohbfh ibb\l□ vy emxs bo dhfgpbc :

1. l□ bnngpbevghf ihdexgbb baf ylv bfggh aghlv gi□ yg bc fm bg\□lbmxs bf□ b gbg\l□ bmxsbf \ohfb dge□ , l□. bnngpbevgh□ giy□ gb□. Lf□ g□ fg□ , gh □ohbfh ihfg bl v, l□ h giygb □ l□ gbl □evg□ ge□ **c afeb fm e□ g□ bo o□ o (bgn ag□ gi□ □gb □) g□ eg □ i□ u r l□ v l□ m l bf□ bl ag□ o□ g□□ bg□ e□**.
2. l\bevgh □ ihdexgb□ bge□ d bn n gpbevghfm \ohm — wlh \□ l□ oih\h □gh□ **bggb**□ . Ghoh□ bfh aeylv bgevgu□ ih\h□ , ihdex□ ggu□ d \uhdhbfi□ gghfm \ohm , b hsbc ih\h□ aafegby . Ldbf hahf , bdexl□ y ihld□ gb□ hevrhh lhd□ ih bgevguf ih\hf , gbxs□ lhghlv bafgbc .
3. l□ ihde x gbb g□dhevdbo blh□ gbdh\ bge□ d fhmex □ elevgh , lhu bo hsb□ ih \h□ hbgyebv lh evdh □ g □**c l**□ **d**□ — g□ dhgl□dl□ **AGND** og□ atf□ f hmey . Wlh bdex □bl hah\□ gb□ «afe yguo ilev », y\e yxsboy blhgbdhf hihegbl□ evguo ihf□ o.
4. Gbihe vam f u□ o□ u gh□ ohbfh aafeblv — l□. i□ hlh hbgbl v □ dhgldlhf **AGND** ge □ atf□ fhmey .

[2] Kf□. Kbgohgbapby . himlbfh□ gi□ ygb□ g□ \oh□ SYN – 0… 5,5 □ hlghblevgh afeb fhmey (dhgldlu AGND).

G□ emxsf□ bmgd□ ib\gu ibfu dhdlghh bnngpbevghh ihdexgby hghnaguo b\monaguo (□bnngpbevguo) blhgbdh\□ bge□ . Hlbl□ \gbf□ gb□, lh ihdex□ gb□ d bn ngpbevghfm \ohm □ h□ghnaguo blhgb dh\ bge□ hegh hmsl\eylvy lfy ih\hfb !

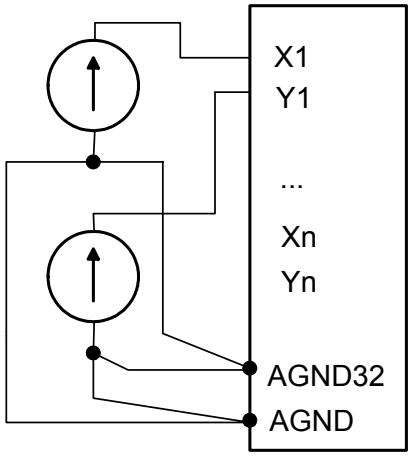


b n n gpbe vgh□ i□ dex □□gb□ bge□ □

bnngpbevgh□ ihdexgb□ blhgb d□ bge□ gbl□ mh\gv bgnaguo ih fo□ . lhfbfh wlhh , bnngpbevgu□ \ohu ihe\heyxl ihdexl□ v blhgbd b bge□ ldbf hahf , lhu lhdb bgevgu o pic g□ihldeb a hbg hsbc ih \h□, lh ih\url□ lhghlv bafgbc .

ey m\h□gby be□ \ohgu o d□geh\ bih evamly gbnngpbevgh□ ihdexgb□ , l□g. bf □hsc afec , \dhlhhf blhgbdb bge□ hegu ihdexl□ vy d mlhc□ l\m ih o f□ , ib\gghc gb□ :

lhde x □□gb□ b□lhg bdh\ b□ g□e□
\32o dgev ghf □ □bf□



lhde x □□gb□ bg e□ □□bf□ «□s□ c a fe□ c»

7. lhffghc hgb .

lhffghc hgb mlh c \ bb QMBox10 h lhbl ba emxsbo dhfihggh\ :
- lhff guc idl QMLab
- lhff gh hgb ey fhlhylevghh ihffbh\gby (idl SDK)

7.1. lhffguc idl lQMLab.

lhffguc idl QMLab y\e ylv mgb\evguf ihffguf bglmfglhf ey hlu mlhcl\ fb bb QMBox. Hg iha\heyl rblv hevrbgl\h lbih\uo a , \hagbdxs bo i b \th flbapbb bafgbc .

ldl QMLab iha\heyl ibbmiblv dhl am ihe ihdexgby mlhcl\ , a m lby i hffblh\ b flhe hh\ ihemblv , hh lv , \bam ebabh\ v b hogbl v m hldebh\ggu ggu , ib\ ggu dlmfuf bgbpf bafgby .

hl\ idl QMLab \ohyl :
- bllh -fhibp ;
- hpbeehh ;
- idlhgebalh ;
- ehd i\bghc h hldb ggu o.

l\bgy hhld ggu o fhl \dex lv \ y debh\dm , mggb , \ubegb dhhlb bafggby bge b l..
Khoggb ey ihe mxsc hhldb \y \ lgtguo ldlh\uo b bggu o nhflo , ibhguo ey \\h \ hsibgylu b ip bebabh \ggu ih ffu hhldb ggu o (Excel, MathLAB, Cool Edit pro b .)

lhhgh hibgb idl QMLab i b\gh \ hdmfgl «**QMLab User Manual»**, dhlhuc fhgh gclb g cl www.R-Technology.ru b g ihl\eyfhf \fl mlhcl\hf CD.

7.2. lH ey fhlhyl evghh ihffbh\gby .

lhfbfh adhggghh ihffghh idl QMLab \ dhfiedl ihlldb m l hc l \ QMBox \dex g id l SDK - wlh lH b hdmfglpby , igaggguey ihevah \ec , hbxsboy ha\v \hb hl\ggu ibeh gby ey hlu mlhcl\hf . Wlh lH hlhbl ba bebhld nmgdpbc (API) b ibf h\ ihffbh\gby .

lhevah\ev bfl \hafh ghlv ha\v iheghpggu ibehgby , hi bmy lhe vdh ghevrbf dhebl\hf bebhl guo nmgdpbc. lb wlhf be bhlgu nmgdpbb gl bgu ldbf haahf , lh iha\heyxl hlv mlhcl\hf gbd mgghf mihffblm , g \exs fm lhgdhlyfb fghhih l hghh b h t dl gh-h bglbh\gghh ihffbh\gby .

lhhgh lH ey fhlhyl evghh ihffbh\gby hibgh \ hdmf gl «**QMBox Programming Guide**», dhlhuc fh gh g clb g cl www.R-Technology.ru b g ihl\e yfhf \fl mlhcl\hf CD.

Ibe gb :. Mlgh\d c\ mlhcl\ .

cu mlhcl\ bb QMBox mlgteb\ xly \thf bdb ib mlgh\d ihffghh hlgby bdd , \ohysh \ dhfiedl ihtdb mlhcl\ . eb c\u mlhcl\ g ueb itbevgh mlgh\egu g dhfivxl , beb ihbahr e hc ib bo mlgh\d , bo fh gh mlgh\blv \m gmx.

Dd itbe h, HK Windows ib hgm gbb gh\hh mlhcl\ aimdl F l gh\hh hhmh\gby (Found New Hardware Wizard). wlhf em gmgh eh\lv h mdagbyf , hldarb v hl ih dexg by d maem Windows Update b mdal \ dl\ fm thehgb y c\ ii dm«\DRV» g CD, \ohysf \ dhfiedl ih tdb mlhcl\ .

HK Windows fhl g aimblv \thftb db F l gh\hh hhmh\gby (Found New Hardware Wizard) , \u\ ib wlhf \ heb m\hf egbc (it -\gba mwdg) hhsgb h ihef c\hf :

wlhf em gmgh aimblv bim Mlhcl\ (Device Manager). ey aguo \ bc HK Windows bim mlhcl\ aim dly ih -aghfm . Gib f , ey Windows 7 fhgh aimblv h debdgm\ithc dghidhc furb g bdhgd Dhfivxl , e – K\hcl\ , e – bim Mlhcl\ .

bim mlhcl\ QMBox ml \u eylv \ ibd mlhcl\ dd Gba\lg h mlhcl\h , beb Mlh cl\h , hlxs hrbdfb . Gmgh debdgmlv g gzf ithc dghi dhc furb b \u lv «Update Driver Software»:

(Found New Hardware Wizard):

«Browse my computer for driver software» «\DRV» CD

(Wizzard). «R-Technology Devices»,

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