

Подключение DS18B20 в режиме внешнего питания рис 5.

64-BIT код датчика

```

DZ`^uc '6 % kh^_j`bl mgbdz bmguc dh^ jkk khojZg_gguc \ 520 FeZ^rb
[blh\ dh^Z 520 kh^_j`Zl dh^ k-Wirecik\Z^hf '6 % 2Bv. Ke_^mxsb_ [blh\ kh^_j`
mgbdz evguc k_jbcguc ghf_j KlZjrb_ [blh\ kh^_j`Zl pbdebq_kdh]h dhgljhey b
dhlhjuc \uqbke_g hl i_j\uo [blh\ dh^Z 520 >_lZebabjh\Zggh_ h[tykg_gb
dhgljhey ba[ulhqghklb h[_k\jZaZ GENERATION pbdebq_kdh]h dhgljhey ba[ulhqgh
[blh\uc dh^ 520 b k\yaZggZy nmgdpby 520 mijZ\eyxl eh]bdhc iha\h e-Wire '6 %
mkljhckl\h bkihevamy ijhlhdhe ^_lZebabjh-WIREBUS SYSTEM_ve\hc lZ[ebpu ^Zgguo
    
```

64-BIT LASERED ROM CODE j b k6

ПАМЯТЬ

```

lZfyly '6 % ¶V hj]Zgbah\ZgZ dZdj bkd Z Zyglv kkhkhlbl ba hi_$RAM gZhfylb b
wg_j]hg_aZ\bkbfhc EEPROM l_j\u_ ^Z j_]bkljZ wlh j_]bklju dhg\_jlhjZ l_fi_jZl
b^mj_]bklju :\Zjbbjog_]h b gb`g_]h H and Z b j_]bklj dhgnb]mjZpbb H[jZlbl_\g
qlh _keb nmgZpby 6 % g_ bkihevalm_jlk]bklj and TL fh]m]yq_cdZrb\_jkZevghc
iZfyb <k_dhfZg^u iZfyly hibkZgu ih^jh FUNCTION COMMANDS DS18B20.
;Zcl b [Zcl HAM h^_j`bl feZ^rb bkljrb]bl l_fi_jZlmjgh]h j_]bkljZ khh\_\kl\_g
[Zclu lhevdh ^ey ql_gby ;Zclu b h[_kijq]b\Zj and TL dZcl kh^_j`bl ^Zgguo
j_]bkljZ dhgnb]mjZpbb dhlju_ h[tykgyxky ih^jh[gh \ jZa^_e_ J?=BKLJ
(CONFIGURATION REGISTER) wlhc lZ[ebpu ^Zgguo ;Zclu b aZj_a_j\bjh\Zgu ^
bkihevah\Zgby mkljhckl\hf\ bwlZj b]bklju g_\hafh`gZ ijb ql_gbb wlb [Zclu \ha\
\k_o jZajy^Zo
8 ;Zcl HAM lhevdh ^ey ql_gby b kh^_j`Zl pbdebq_kdbc(CRC) b]h\ev cbak elhggtckl
^ey [Zclh\ - 7 HAM '6 % ]_g_jbjm_l pbdebq_kdbc dhgljhey ba[ulhqghklb
hibkZgguc \ jZa^gejZpby pbdebq_kdh]h dhgljhey ba[ulhqghklb
>ey aZibkb ^Zgguo \ [Zclu HAM bkihevamy Write Scratchpad [4Eh] ^Zgguo_ ^he]gu
[ulv i_j^Zgu dB20, gZqbgZy k [ZclZ Qlh[u d]hj]_d]bghklv aZibkb g_Zhg]gho bfh
\uihegbly ql_g]bkihevamy dhfZg^mRead Scratchpad [BEh] ihke_lh]h dZd [mZ'nglu_
aZibkZgh]jZlbl_\gbfZgb_ qlh ijb ql_g]bb %ZgguoZ_qbgZ_l i_j^Z\ZclZ Qlh[u
khojZgbTL, TL b ^Zgguo_]bkljZ dhgnb]mjZp EEPROM, mkljhckl\h mijZ\e_gb_\u^Zlgh
dhfZg Copy Scratchpad [48h].
>ZggukhojZg_ggu_ \ j_ EEPROM ijb \dexq_gbb iblZg]j]m`Zxlky \ HAM
>Zgguo_ fh]ml [ulv i_j_aZ] EEPROM baHAM \_ex[h_ \j_fy d Read [B8h].
Mkljhckl\h mijZ\e_gby fh`_l dhgljheb]h\RevalHE [B8]x ijhp_kk \uah\Z ^Zgguo
EEPROM \ HAM i mlkbg]h b f rZed\kZe_ dhfZg^u b dhgljhey kthg]hlygby
hi_jZpby i_j_aZ]j]m`Z`_lkykeb ijhp_kk \uiheg_g
    
```



```

l_jbf_j ijh]jZffu ^e16 ^ey jZ[hlu k h^gbf mkljhckl\hf gZ ebgbb
;=====
                                ql_gb_ l_fi_jZl
celsio                                ;
;=====
    baf_j_gb_ l_fi_jZlmju                ;
        call    DOUT_LOW                    kehl ql_gby ^ey dhgljhey
        call    DOUT_HIGH                   hdhgqZgby dhg\_jlbjh\Zgby
        btfss   DALLAS                      ;
    return                                          ;
        btfsc   CON                          ;
    goto    ctenie                               ;
        call    RESET_DALLAS                 ;
        btfsc   ERROR_D                      ;
    return    ^Zlqbd g_bkijZ\_g ij\_jZlv dhg\_jlbjh\Zgb_ l_fi
;=====
        movlw   H'CC'                        ; nhjfbjh\Zl\hfZg^m ljhimROMlv
        call    DSEND                        ;
        movlw   H'44'                        ; nhjfbjh\Zl\hfZg^m Dhg\_jlbjh\Zlv l_fi_jZlm
        call    DSEND                        ;
;=====
        bsf     CON                          b^_l dhg\_jlbjh\Zgb_
    return                                          ;
;=====
ctenie                                ql_gb_ l_fi_jZlmju
        bcf     CON                          ; dhg\_jlbjh\Zgb_ \uiheg_gh
;=====
        call    RESET_DALLAS                 ;
        btfsc   ERROR_D                      ;
    return    ^Zlqbd g_bkijZ\_g ij\_jZlv fi_jZlmju
        movlw   H'CC'                        ; ihkeZlv dhfZg^m ljhimROMkiblv
        call    DSEND                        ;
        movlw   H'BE'                        ; ihkeZlv dhfZg^m ql_gby iZfylyb
        call    DSEND                        ;
        call    DRECEIVE                     qbIZlv [Zcl
        movf    COM_REG,W                     ;
        movwf   TEMP_LO                       ;
        call    DRECEIVE                     qbIZlv [Zcl
        movf    COM_REG,W                     ;
        movwf   TEMP_HI                       ;
    return                                          ;

```

Запись в память [4Eh]

```

WIZ dhfZg^Z iha\hey_l mkljhckl\m mijZ\e_gby aZibku\Zlv [ZclZ ^Zgguo \iZ
l_j\uc [Zcl ^Zgguo aZibku\Z_lkyTH j\_l\klijhc [Zcl aZibku\Z\_lky b ljj\_l\bklij
[Zcl aZibku\Z\_lky \j_]bklij dhgnb]mjZpbb
>Zggu_ ^he`gu [ulv i_j^Zgu gZbf_gvrbf agZqZsbf [blhf \i_j_^
>ey ^Zlqbdh\ l_fi_jZlmju k iZjZablguf iblZgb_f \k_ ljb [ZclZ >HE@GU [ulv
DHIBJH<:GB? HAM <hIAM`>_ q_f mkljhckl\hf mijZ\e_gby [m^_l k]_g_jbjh\Zg b
bgZq_ ^Zggu_ [m^ml ihl_jygu

```

Чтение памяти [BEh]

```

WIZ dhfZg^Z iha\hey_l mkljhckl\h mijZ\e_gbyZlv kh^_j`Zgb_ l:FYLB l_j^ZqZ
gZqbgZ_lky k gZbf_gvr_]h agZqZs_]h [bIZ [ZclZ h]hijZbeZ[Zcl b]re bq_kdbc
dhgljhev ba[ulhqghklb Mkljhckl\hf mijZ\e_gbylv k[jhk qlh[u aZdhgqblv ql_gb
\j_fy _keb g_h[oh^bfh lhev dh qZklv ^Zgguo

```


h^ghfm mkljhckl\m hijj_b_bo_gjhba\h^k?keb iButtons bf_xl lh ` _ kZfhjbcgughf_j
 bo k_f_cgu_ dh^m\hlebqgu Wlbf, kikhkexqZ_ekjhc [_kihjy_bhd g_h^je_gghklv
 Ihke_ ih^ZdhfZg^**Соответствие ROM [55h] (Match)**, =eZ\gm_kljhckl\h^_l ihkeZgh \ l_q_g
 ke_^mxsbo kehlh\ vjh^_g^ZgROM iZfylb lj_[m_fh]h mkljhckl\Z^h\ZI_evghklv [blh
 ^he`gZ [ulv l_f ` _ kZfufherd q_dguhglbgd520b lh_kleZ^rbf[blhf \i_j_^
 gZqbgZykv k khf_dhgZ] khijh\h^Z_fh]h k_jbcguf ghf_jhf b pbdeboqkldqg hklhlijh
 <k_iButtons 520 dhjhjg\hkhhl\lkl\m_l lj_[dh^fhfkhZgmiky \ g_Zdlb\ghf khckZhyg b b
 ihemqZjlm]hc Bfimevk K[jhkZ

C.3. Команда Поиск ROM [F0h] (Search)

?keb=eZ\gh_ mkljhckl\hgZ_l k_jb_ggh_jnkljhckl\h^dexq_gggh]hg_lh kms_kl\m_l
 \hafh`ghklv b^_glbnbpbjh\ZROMd_bZu^h]h mkljhckl\Z ih^dexq_gggh]heyd wlbgh.
 g_h[oh^bfh bkihevah\ZlvldhkfZg^**Поиск ROM [F0h] (Search)** WIZ dhfZg^Zm_bZdhfZg^ZI_gby
 ROM h[t_^bg_g^Z^hfZg^kdhhl\lkl\ROM.
 Ijhp_kk \u]ey^bl ke_^mxsbf h[jZahf Ihke_ nhjfbjh\Zgby]eZ\guf **Поиск ROM [F0h] (Search)** \k_ mkljhckl\Buttons ihke_ ^h\ZI_evgh [m^ml nhjfbjh\Zlv gZ rbg_ khkl
 <1> khhl\lkl\mxsb_ bo agZq_lbg_xkdh]h [blZ 520 **двух времен** IZdlhkqblu\Zgby
 ihkenhjfbjh\ZgbyhfZg^u 520 lhbkdZ

- ?keb \k_ mkljhckl\Z`ZI \ wlhc ihabpbb ^\hbgqgh]h jZajy^Z
- «0» lq_gb_ [m«01»;
- «1» j_amev\ZI «10»_l

?keb mkljhckl\Z kh^_j`ZI \ wlhc ihabpbb ^\hbgqgh]h jZajy^Z ijb^ «00» [blh\
 mdZau\Zy dhgnebdl
 =eZ\gh_ mkljhckl\h \ ke_^mxs_f lj_lv_f lZdl_ kehl_jZajy^g la_gZhf_ljbm_l be b
 qlh[u hlh[jZkvjhckl\Z dhjhju_ hklizgm\iky_ \u[hjZ
 <k_mkljhckl\Z m dhjhjuo [bl g\mkhjh_bkmk]fbjh\Zggghfm]eZ\guf mkljhckl\hf i_j
 khklhygh_b^Zgby b [m^ml gZoh^blvkygb_g_f ihhahzqZxl Bfimevk K[jhkZ kllZkby i_j
 \u[hjZ[m^ml ke_ ^h\Zlv qbZxsbo \u[hjZg^ZldheZ_eZ\gh_ mkljhckl\h^_e dh^
 ROM h^g]h^h^qbg_ggrh_kjhjcZlh[jZlblvky d.g_fm
 DZ^Zk^Z^aby \u[hjZ khklhbl ba ^\mo kehlh\ <j_f_gh^ blgqklehZg_bjy_fbgg aZibl
 lheguc ijhp_kk barbhqgghy\j_f_ggZy Z^j_ kjZp^yabl_evgh ljb^eZgZ dhfZg^u 520
 Khhl_lklby gh wlh ihah\hey_lba\kZlo k\yaZgguo mkljhckl\ ihk^k^ ^d hZROMevgh
 <ijbeh`_gb^_iButtons mkljhckl\Z ih^dexq_gu d h^ghb_yey_lky kZfuf wnn_dlb\
 kihkh[hf qlh[u hij_ ^eblv dh^u \k_ 520 ih^qbg_gguo m^kZhgckl\m klljrec_kldh]lh`_
 bkihevah\Zlv dhfZg^m 520 Khhl\lkl\by qdh_huj_h^jZelbg_ghyjhckl\m
 ?keb ijbeh`_gb_ lj_[m_l ihklhyggghc b_b_ggh_brbgZp_bpbh\ufm_kljhckl\Zf^d dZd
 hgb fh]ml ih^dexqZlvky b hldexqZlky,ylhmkh^hckZ[hlmijZ\e_gby[m^helghkihevah\Zlv
 dhfZg^mbk520 qlh[u b^ngpbjh\Zdh^u 520eyh[jZsZlvky d dZ`^hfmmgk]h^k^l\m
 ;eh-ko_f_ \k_o DhfZg^ 520 ihdZau\Zxl \52eexkljZpbb

LZd dZd eh]bdZ dhfZg^u 520ubh^edZg_jcp_kkke_ ^mxsbc ijb_f_j bkihevam_ ky
 beexkljbjh\ZMh rZ] aZ rZ]hf

Q_luj_ mkljhckl\Zgh\e_gu gZ rbg_hbqgh^h^_j`Zgb_ 520_ ^mxs__

```
mkljhckl\h      [ [ [ [ [ [
mkljhckl\h      [ [ [ [ [ [
mkljhckl\h      [ [ [ [ [ [
mkljhckl\hxxxxx10001000
```

^ey mijhs_gkby\hehfx»@aZf_g_gkuZjrb_[blub ihdZaZghuevdh feZ^Ab_k_fv [blh\
 kh^_j`Zgby 520kd feZ^r_]h [blZ ijhbkoh^blv ke_ ^mxsbf h[jZahf

1. =eZ\gh_ mkljhckl\hgZ_l ihke_ ^h\ZI_evghklv bgbpbZebaZpbb
 - nhjfbjm **Импульс Сброса.**
 - iButtons hl_ qZxlhjfjbjh\Zg **импульсов Присутствия.**
2. Lh]^Z =eZ\gh_ mkljhckl\h^_l dhfZg **Поиск ROM.**

DS18B20 OPERATION EXAMPLE 2

< wlfh jbf_b_kihevam_lkvevdh h^bg '6 % gZk rbZjZ ablg uZfZg b_ Mkljhckl\h
 mijZ\e_gby ihk uZg gL(TH, TL, and config) dj_]bkljZf dhgnb]mjZ'6 % aZ_f qblZ_l
 HAMh\lhjgh \uqbkbq_kdbc dhgljhev ba[uihqghklb qh[u_ jZ_e_jblmk\Zhgk\h
 mijZ\e_gbyibjm_l kh^_j'ZAM EEPROM.

MASTER MODE	DATA (LSB FIRST)	COMMENTS
TX	Reset	Master issues reset pulse.
RX	Presence	DS18B20 responds with presence pulse.
TX	CCh	Master issues Skip ROM command.
TX	4Eh	Master issues Write Scratchpad command.
TX	3 data bytes	Master sends three data bytes to scratchpad (TH, TL, and config).
TX	Reset	Master issues reset pulse.
RX	Presence	DS18B20 responds with presence pulse.
TX	CCh	Master issues Skip ROM command.
TX	BEh	Master issues Read Scratchpad command.
RX	9 data bytes	Master reads entire scratchpad including CRC. The master then recalculates the CRC of the first eight data bytes from the scratchpad and compares the calculated CRC with the read CRC (byte 9). If they match, the master continues; if not, the read operation is repeated.
TX	Reset	Master issues reset pulse.
RX	Presence	DS18B20 responds with presence pulse.
TX	CCh	Master issues Skip ROM command.
TX	48h	Master issues Copy Scratchpad command.
TX	DQ line held high by strong pullup	Master applies strong pullup to DQ for at least 10ms while copy operation is in progress.

Приложение.

l jbf_j ih^ijh]jZffgZZkk_f[e_ey k_PIC b lZdlh\hc f=p ih^jZamf_\Z_lky b kihe
 \gmlj_gg_]h]_g_jZ fZ ijh]jZffZ ijb\ \u_rgZ^ey ql_gby ^\mo [Zcl l_fi_jZlmju [_a
 ^hklh_jghklb ^Zgguo

```

=====
;DOUT_LOW WIZ ih^ijh]jZffZ mklZgZ\eb\Z_l ebgbx >:EE:KKZ gZ \u\h^"0" mklZgZ
DOUT_LOW
                bcf          DALLAS                mklZgh\biv gbadbc mjh\_gv gZ
                bsf          STATUS,RP0            \u[jZlv [Zgd
                bcf          TRISDAL,LINE          gZkljhblv ihjl gZ \uoh^
                bcf          STATUS,RP0            \u[jZlv [Zgd
                nop
                nop
                retlw .0
=====
    
```

Примечание: обратите особое внимание на формирование импульса восстановления DOUT_HIGH, это так называемый «Активный» импульс восстановления, когда на стандартное заданное время в линию для восстановления уровня закачивается ток с порта контроллера. Этот эффект позволяет значительно улучшить фронт сигнала. Формирование фронтов таким образом - это гарантия работы на удаленные датчики!!!

'287B+,*+ WIZ ih^ijh]jZffZ mklZgZ\eb\Z_l ebgbx >:EE:KKZ dZd \h^ ijh^Z\eb
 mjh_g_f rbgm
 Z aZl_f_i\h^bl ebgbx gZ ijb_f \g_rgbc j_abklhj m^_j`b\Z_l \ukhdbc mjh_gv

