



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

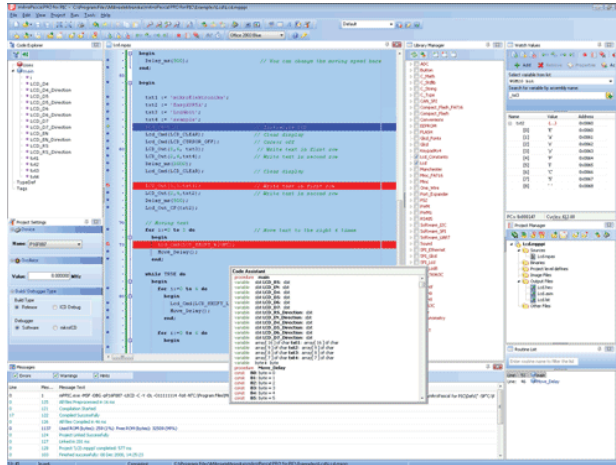
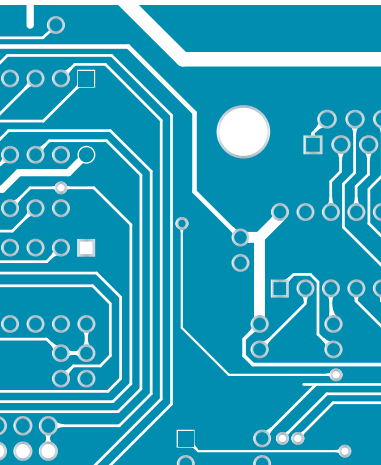
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



mikroPASCAL PRO for PIC



Develop your applications quickly and easily with the world's most intuitive mikroPascal PRO for PIC Microcontrollers.

Highly sophisticated IDE provides the power you need with the simplicity of a Windows based point-and-click environment.

With useful implemented tools, many practical code examples, broad set of built-in routines, and a comprehensive Help, mikroPascal PRO for PIC makes a fast and reliable tool, which can satisfy needs of experienced engineers and beginners alike.

April 2009.

Reader's note

DISCLAIMER:

mikroPASCAL PRO for PIC and this manual are owned by mikroElektronika and are protected by copyright law and international copyright treaty. Therefore, you should treat this manual like any other copyrighted material (e.g., a book). The manual and the compiler may not be copied, partially or as a whole without the written consent from the mikroElektronika. The PDF-edition of the manual can be printed for private or local use, but not for distribution. Modifying the manual or the compiler is strictly prohibited.

HIGH RISK ACTIVITIES:

The *mikroPASCAL PRO for PIC* compiler is not fault-tolerant and is not designed, manufactured or intended for use or resale as on-line control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines, or weapons systems, in which the failure of the Software could lead directly to death, personal injury, or severe physical or environmental damage ("High Risk Activities"). mikroElektronika and its suppliers specifically disclaim any express or implied warranty of fitness for High Risk Activities.

LICENSE AGREEMENT:

By using the *mikroPASCAL PRO for PIC* compiler, you agree to the terms of this agreement. Only one person may use licensed version of *mikroPascal PRO for PIC* compiler at a time. Copyright © mikroElektronika 2003 - 2009.

This manual covers *mikroPASCAL PRO for PIC* version 1.0 and the related topics. Newer versions may contain changes without prior notice.

COMPILER BUG REPORTS:

The compiler has been carefully tested and debugged. It is, however, not possible to guarantee a 100 % error free product. If you would like to report a bug, please contact us at the address office@mikroe.com. Please include next information in your bug report:

- Your operating system
- Version of *mikroPASCAL PRO for PIC*
- Code sample
- Description of a bug

CONTACT US:

mikroElektronika
Voice: + 381 (11) 36 28 830
Fax: + 381 (11) 36 28 831
Web: www.mikroe.com
E-mail: office@mikroe.com

Windows is a Registered trademark of Microsoft Corp. All other trade and/or services marks are the property of the respective owners.

Table of Contents

CHAPTER 1	Introduction
CHAPTER 2	<i>mikroPASCAL PRO for PIC Environment</i>
CHAPTER 3	<i>mikroICD (In-Circuit Debugger)</i>
CHAPTER 4	<i>mikroPASCAL PRO for PIC Specifics</i>
CHAPTER 5	PIC Specifics
CHAPTER 6	<i>mikroPASCAL PRO for PIC Language Reference</i>
CHAPTER 7	<i>mikroPASCAL PRO for PIC Libraries</i>

CHAPTER 1

Features	2
Where to Start	3
mikroElektronika Associates License Statement and Limited Warranty	4
IMPORTANT - READ CAREFULLY	4
LIMITED WARRANTY	5
HIGH RISK ACTIVITIES	6
GENERAL PROVISIONS	6
Technical Support	7
How to Register	7
Who Gets the License Key	7
How to Get License Key	7
After Receiving the License Key	9

CHAPTER 2

Main Menu Options	13
File Menu Options	14
Edit Menu Options	15
Find Text	16
Replace Text	17
Find In Files	17
Go To Line	18
Regular expressions	18
View Menu Options	19
Toolbars	20
File Toolbar	20
Edit Toolbar	20
Advanced Edit Toolbar	21
Find/Replace Toolbar	21
Project Toolbar	22
Build Toolbar	22
Debugger	23
Styles Toolbar	23
Tools Toolbar	24

Project Menu Options	25
Run Menu Options	27
Tools Menu Options	28
Help Menu Options	29
Keyboard Shortcuts	30
IDE Overview	32
Customizing IDE Layout	33
Docking Windows	33
Saving Layout	34
Auto Hide	35
Advanced Code Editor	36
Advanced Editor Features	36
Code Assistant	37
Code Folding	38
Parameter Assistant	39
Code Templates (Auto Complete)	39
Auto Correct	39
Spell Checker	40
Bookmarks	40
Goto Line	40
Comment / Uncomment	40
Code Explorer	41
Routine List	42
Project Manager	43
Project Settings Window	44
Library Manager	45
Error Window	46
Statistics	47
Memory Usage Windows	47
RAM Memory Usage	47
Used RAM Locations	48
SFR Locations	49
ROM Memory Usage	50
ROM Memory Constants	51
Functions Sorted By Name	52
Functions Sorted By Size	53

Functions Sorted By Addresses	54
Functions Sorted By Name Chart	55
Functions Sorted By Size Chart	56
Functions Sorted By Addresses Chart	57
Function Tree	58
Memory Summary	59
Integrated Tools	60
USART Terminal	60
EEPROM Editor	61
ASCII Chart	62
Seven Segment Convertor	63
Lcd Custom Character	63
Graphic Lcd Bitmap Editor	64
HID Terminal	65
UDP Terminal	66
mikroBootloader	66
What is a Bootloader	66
How to use mikroBootloader	67
Features	67
Integrating User Code and Boot Code	68
Macro Editor	69
Options	70
Code editor	70
Tools	70
Output settings	71
Regular Expressions	72
Introduction	72
Simple matches	72
Escape sequences	72
Character classes	73
Metacharacters	73
Metacharacters - Line separators	73
Metacharacters - Predefined classes	74
Metacharacters - Word boundaries	74
Metacharacters - Iterators	75
Metacharacters - Alternatives	76

Metacharacters - Subexpressions	76
Metacharacters - Backreferences	76
mikroPascal PRO for PIC Command Line Options	77
Projects	78
New Project	78
New Project Wizard Steps	79
Customizing Projects	82
Managing Project Group	82
Add/Remove Files from Project	82
The project can contain the fol	82
Project Level Defines	83
Source Files	84
Managing Source Files	84
Creating new source file	84
Opening an existing file	84
Printing an open file	84
Saving file	85
Saving file under a different name	85
Closing file	85
Clean Project Folder	86
Compilation	87
Output Files	87
Assembly View	87
Error Messages	88
Compiler Error Messages:	88
Warning Messages:	90
Hint Messages:	90
Software Simulator Overview	91
Breakpoints Window	92
Watch Window	92
View RAM Window	94
Stopwatch Window	95
Software Simulator Options	96
Creating New Library	97
Multiple Library Versions	98

CHAPTER 3

mikroICD Debugger Options	101
mikroICD Debugger Example	102
mikroICD (In-Circuit Debugger) Overview	106
Breakpoints Window	106
Watch Window	106
EEPROM Watch Window	107
Code Watch Window	108
View RAM Window	109
Common Errors	109
mikroICD Advanced Breakpoints	110
mikroICD provides the possibili	110
Program Memory Break	111
File Register Break	111
Emulator Features	111
Event Breakpoints	111
Stopwatch	111

CHAPTER 4

Pascal Standard Issues	114
Divergence from the Pascal Standard	114
Pascal Language Extensions	114
Predefined Globals and Constants	115
SFRs and related constants	115
Math constants	115
Predefined project level defines	115
Accessing Individual Bits	116
Accessing Individual Bits Of Variables	116
sbit type	117
bit type	117
Interrupts	118
P18 priority interrupts	118
Routine Calls from Interrupt	118
Interrupt Examples	119

Linker Directives	120
Directive absolute	120
Directive org	121
Directive orgall	121
Built-in Routines	122
Lo	123
Hi	123
Higher	123
Highest	124
Inc	124
Dec	124
SetBit	125
ClearBit	125
TestBit	125
Delay_us	126
Delay_ms	126
Clock_KHz	126
Clock_MHz	127
Reset	127
ClrWdt	127
DisableContextSaving	128
SetFuncCall	128
GetDateTime	129
GetVersion	129
Code Optimization	130
Constant folding	130
Constant propagation	130
Copy propagation	130
Value numbering	130
"Dead code" elimination	130
Stack allocation	130
Local vars optimization	130
Better code generation and local optimization	130

CHAPTER 5

Types Efficiency	132
Nested Calls Limitations	132
PIC18FxxJxx Specifics	133
Shared Address SFRs	133
PIC16 Specifics	133
Breaking Through Pages	133
Limits of Indirect Approach Through FSR	133
Memory Type Specifiers	134
code	134
data	134
rx	134
sfr	135

CHAPTER 6

Lexical Elements Overview	139
Whitespace	140
Whitespace in Strings	140
Comments	141
Nested comments	141
Tokens	142
Token Extraction Example	142
Literals	143
Integer Literals	143
Floating Point Literals	143
Character Literals	144
String Literals	144
Keywords	145
Identifiers	146
Case Sensitivity	146
Uniqueness and Scope	146
Identifier Examples	146
Punctuators	147
Brackets	147

Parentheses	147
Comma	147
Semicolon	148
Colon	148
Dot	148
Program Organization	149
Organization of Main Unit	149
Organization of Other Units	150
Scope and Visibility	152
Scope	152
Visibility	152
Units	153
Uses Clause	153
Main Unit	154
Other Units	154
Interface Section	154
Implementation Section	155
Variables	156
External Modifier	156
Variables and PIC	156
Constants	157
Labels	158
Functions and Procedures	159
Functions	159
Calling a function	159
Example	160
Procedures	160
Calling a procedure	161
Example	161
Example:	161
Forward declaration	162
Functions reentrancy	162
Types	163
Type Categories	163
Simple Types	164
Arrays	165

Array Declaration	165
Constant Arrays	165
Multi-dimensional Arrays	166
Strings	166
String Concatenating	167
Note	167
Pointers	168
Function Pointers	168
Example:	168
@ Operator	170
Records	171
Accessing Fields	172
Types Conversions	173
Implicit Conversion	173
Promotion	173
Clipping	173
Explicit Conversion	174
Conversions Examples	174
Operators	175
Operators Precedence and Associativity	175
Arithmetic Operators	176
Division by Zero	176
Unary Arithmetic Operators	176
Relational Operators	177
Relational Operators in Expressions	177
Bitwise Operators	178
Bitwise Operators Overview	178
Logical Operations on Bit Level	178
Bitwise operators and, or, and xor perform logical operation	178
Unsigned and Conversions	179
Signed and Conversions	179
Bitwise Shift Operators	180
Boolean Operators	180
Expressions	181
Statements	182
Assignment Statements	182

Compound Statements (Blocks)	183
Conditional Statements	183
If Statement	184
Nested if statements	184
Case statement	185
Nested Case statement	186
Iteration Statements	187
For Statement	187
Endless Loop	187
While Statement	188
Repeat Statement	188
Jump Statements	189
Break and Continue Statements	189
Break Statement	189
Continue Statement	190
Exit Statement	190
Goto Statement	191
asm Statement	192
Directives	192
Compiler Directives	193
Directives \$DEFINE and \$UNDEFINE	193
Directives \$IFDEF, \$IFNDEF, \$ELSE	193
Include Directive \$I	194
Predefined Flags	194
Linker Directives	195
Directive absolute	195
Directive org	195
Directive orgall	196

CHAPTER 7

Hardware PIC-specific Libraries	198
Miscellaneous Libraries	198
Library Dependencies	199
Hardware Libraries	200
ADC Library	201

ADC_Read	201
Library Example	202
HW Connection	202
CAN Library	203
Library Routines	203
CANSetOperationMode	204
CANGetOperationMode	204
CANInitialize	205
CANSetBaudRate	206
CANSetMask	207
CANSetFilter	208
CANRead	209
CANWrite	210
CAN Constants	210
CAN_CONFIG_FLAGS	211
CAN_TX_MSG_FLAGS	212
CAN_RX_MSG_FLAGS	212
CAN_MASK	213
CAN_FILTER	213
Library Example	213
HW Connection	216
CANSPI Library	217
External dependencies of CANSPI Library	218
Library Routines	218
CANSPISetOperationMode	219
CANSPIGetOperationMode	220
CANSPIInitialize	220
CANSPISetBaudRate	222
CANSPISetMask	223
CANSPISetFilter	224
CANSPIRead	225
CANSPIWrite	226
CANSPI Constants	226
CANSPI_OP_MODE	227
CANSPI_CONFIG_FLAGS	227
CANSPI_TX_MSG_FLAGS	228

CANSPI_RX_MSG_FLAGS	228
CANSPI_MASK	229
CANSPI_FILTER	229
Library Example	230
HW Connection	233
Compact Flash Library	234
External dependencies of Compact Flash Library	235
Library Routines	236
Cf_Init	237
Cf_Detect	238
Cf_Enable	238
Cf_Disable	238
Cf_Read_Init	239
Cf_Read_Byte	239
Cf_Write_Init	240
Cf_Write_Byte	240
Cf_Read_Sector	241
Cf_Write_Sector	241
Cf_Fat_Init	242
Cf_Fat_QuickFormat	242
Cf_Fat_Assign	243
Cf_Fat_Reset	244
Cf_Fat_Read	244
Cf_Fat_Rewrite	245
Cf_Fat_Append	245
Cf_Fat_Delete	245
Cf_Fat_Write	246
Cf_Fat_Set_File_Date	246
Cf_Fat_Get_File_Date	247
Cf_Fat_Get_File_Size	247
Cf_Fat_Get_Swap_File	248
Library Example	250
HW Connection	255
EEPROM Library	256
Library Routines	256
EEPROM_Read	256

EEPROM_Write	256
Library Example	257
Ethernet PIC18FxxJ60 Library	258
Library Routines	259
Ethernet_Init	260
Ethernet_Enable	261
Ethernet_Disable	262
Ethernet_doPacket	263
Ethernet_putByte	264
Ethernet_putBytes	264
Ethernet_putConstBytes	265
Ethernet_putString	265
Ethernet_putConstString	266
Ethernet_getByte	266
Ethernet_getBytes	267
Ethernet_UserTCP	268
Ethernet_UserUDP	269
Ethernet_getIpAddress	270
Ethernet_getGwIpAddress	270
Ethernet_getDnsIpAddress	271
Ethernet_getIpMask	271
Ethernet_confNetwork	272
Ethernet_arpResolve	273
Ethernet_sendUDP	274
Ethernet_dnsResolve	275
Ethernet_initDHCP	276
Ethernet_doDHCPLeaseTime	277
Ethernet_renewDHCP	277
Library Example	278
Flash Memory Library	286
Library Routines	286
FLASH_Read	287
FLASH_Read_N_Bytes	287
FLASH_Write	288
FLASH_Erase	289
FLASH_Erase_Write	289

Library Example	290
Graphic Lcd Library	292
External dependencies of Graphic Lcd Library	292
Library Routines	293
Glcd_Init	294
Glcd_Set_Side	295
Glcd_Set_X	295
Glcd_Set_Page	296
Glcd_Read_Data	296
Glcd_Write_Data	297
Glcd_Fill	297
Glcd_Dot	298
Glcd_Line	298
Glcd_V_Line	299
Glcd_H_Line	299
Glcd_Rectangle	300
Glcd_Box	300
Glcd_Circle	301
Glcd_Set_Font	301
Glcd_Write_Char	302
Glcd_Write_Text	303
Glcd_Image	303
Library Example	304
HW Connection	306
I ² C Library	307
Library Routines	307
I2C1_Init	307
I2C1_Start	308
I2C1_Repeated_Start	308
I2C1_Is_Idle	308
I2C1_Rd	308
I2C1_Wr	309
I2C1_Stop	309
Library Example	309
HW Connection	310
Keypad Library	311

External dependencies of Keypad Library	311
Library Routines	311
Keypad_Init	311
Keypad_Key_Press	312
Keypad_Key_Click	312
Library Example	312
This is a simple example of using	312
the Keypad Librar	312
HW Connection	315
Lcd Library	316
External dependencies of Lcd Library	316
Library Routines	317
Lcd_Init	317
Lcd_Out	318
Lcd_Out_CP	318
Lcd_Chr	319
Lcd_Chr_CP	319
Lcd_Cmd	320
Available Lcd Commands	320
Library Example	321
HW connection	323
Lcd HW connecti	323
Manchester Code Library	324
External dependencies of Manchester Code Library	324
Library Routines	325
Man_Receive_Init	325
Man_Receive	326
Man_Send_Init	326
Man_Send	327
Man_Synchro	327
Man_Break	328
Library Example	329
Connection Example	332
Multi Media Card Library	333
Secure Digital Card	333
External dependencies of MMC Library	334

Library Routines	334
Mmc_Init	335
Mmc_Read_Sector	336
Mmc_Write_Sector	336
Mmc_Read_Cid	337
Mmc_Read_Csd	337
Mmc_Fat_Init	338
Mmc_Fat_QuickFormat	339
Mmc_Fat_Assign	340
Mmc_Fat_Reset	341
Mmc_Fat_Read	341
Mmc_Fat_Rewrite	342
Mmc_Fat_Append	342
Mmc_Fat_Delete	342
Mmc_Fat_Write	343
Mmc_Fat_Set_File_Date	344
Mmc_Fat_Get_File_Date	345
Mmc_Fat_Get_File_Size	345
Mmc_Fat_Get_Swap_File	346
Library Example	347
The following exa	347
HW Connection	350
OneWire Library	351
Library Routines	351
Ow_Reset	352
Ow_Read	352
Ow_Write	352
Library Example	352
This example reads the tem	352
erature using DS	352
HW Connection	355
Port Expander Library	356
External dependencies of Port Expander Library	356
Library Routines	356
Expander_Init	357
Expander_Read_Byte	358

Expander_Write_Byte	358
Expander_Read_PortA	359
Expander_Read_PortB	360
Expander_Read_PortAB	361
Expander_Write_PortA	362
Expander_Write_PortB	363
Expander_Write_PortAB	364
Expander_Set_DirectionPortA	365
Expander_Set_DirectionPortB	365
Expander_Set_DirectionPortAB	366
Expander_Set_PullUpsPortA	366
Expander_Set_PullUpsPortB	367
Expander_Set_PullUpsPortAB	367
Library Example	368
HW Connection	369
PS/2 Library	370
External dependencies of PS/2 Library	370
Library Routines	370
Ps2_Config	371
Ps2_Key_Read	372
Special Function Keys	373
Library Example	374
HW Connection	375
PWM Library	376
Library Routines	376
PWM1_Init	376
PWM1_Set_Duty	377
PWM1_Start	377
PWM1_Stop	377
Library Example	377
HW Connection	379
RS-485 Library	380
External dependencies of RS-485 Library	380
Library Routines	381
RS485Master_Init	381
RS485Master_Receive	382

RS485Master_Send	383
RS485Slave_Init	384
RS485slave_Receive	385
RS485Slave_Send	386
Library Example	386
HW Connection	390
Message format and CRC calculations	391
Software I ² C Library	392
External dependencies of Software I ² C Library	392
Library Routines	392
Soft_I2C_Init	393
Soft_I2C_Start	393
Soft_I2C_Read	394
Soft_I2C_Write	394
Soft_I2C_Stop	395
Soft_I2C_Break	395
Library Example	396
Software SPI Library	399
External dependencies of Software SPI Library	399
Library Routines	399
Soft_SPI_Init	400
Soft_SPI_Read	401
Soft_SPI_Write	401
Library Example	401
Software UART Library	404
Library Routines	404
Soft_UART_Init	405
Soft_UART_Read	406
Soft_UART_Write	407
Soft_UART_Break	408
Library Example	409
Sound Library	410
Library Routines	410
Sound_Init	410
Sound_Play	411
Library Example	411

HW Connection	414
SPI Library	415
Library Routines	415
SPI1_Init	415
SPI1_Init_Advanced	416
SPI1_Read	417
SPI1_Write	417
SPI_Set_Active	417
Library Example	418
HW Connection	419
SPI Ethernet Library	420
External dependencies of SPI Ethernet Library	421
Library Routines	422
PIC16 and PIC18:	422
PIC18 Only:	422
SPI_Ethernet_Init	423
SPI_Ethernet_Enable	425
SPI_Ethernet_Disable	426
SPI_Ethernet_doPacket	427
SPI_Ethernet_putByte	428
SPI_Ethernet_putBytes	428
SPI_Ethernet_putConstBytes	429
SPI_Ethernet_putString	429
SPI_Ethernet_putConstString	430
SPI_Ethernet_getByte	430
SPI_Ethernet_getBytes	431
SPI_Ethernet_UserTCP	432
SPI_Ethernet_UserUDP	433
SPI_Ethernet_getIpAddress	434
SPI_Ethernet_getGwIpAddress	434
SPI_Ethernet_getDnsIpAddress	435
SPI_Ethernet_getIpMask	435
SPI_Ethernet_confNetwork	436
SPI_Ethernet_arpResolve	437
SPI_Ethernet_sendUDP	438
SPI_Ethernet_dnsResolve	439

SPI_Ethernet_initDHCP	440
SPI_Ethernet_doDHCPLeaseTime	441
SPI_Ethernet_renewDHCP	441
Library Example	442
HW Connection	449
SPI Graphic Lcd Library	450
External dependencies of SPI Graphic Lcd Library	450
Library Routines	450
SPI_Glcd_Init	451
SPI_Glcd_Set_Side	452
SPI_Glcd_Set_Page	452
SPI_Glcd_Set_X	453
SPI_Glcd_Read_Data	453
SPI_Glcd_Write_Data	454
SPI_Glcd_Fill	454
SPI_Glcd_Dot	455
SPI_Glcd_Line	455
SPI_Glcd_V_Line	456
SPI_Glcd_H_Line	456
SPI_Glcd_Rectangle	457
SPI_Glcd_Box	458
SPI_Glcd_Circle	458
SPI_Glcd_Set_Font	459
SPI_Glcd_Write_Char	460
SPI_Glcd_Write_Text	461
SPI_Glcd_Image	462
Library Example	462
HW Connection	465
SPI Lcd Library	466
External dependencies of SPI Lcd Library	466
Library Routines	466
SPI_Lcd_Config	467
SPI_Lcd_Out	468
SPI_Lcd_Out_CP	468
SPI_Lcd_Chr	469
SPI_Lcd_Chr_CP	469

SPI_Lcd_Cmd	470
Available SPI Lcd Commands	470
Library Example	471
HW Connection	472
SPI Lcd8 (8-bit interface) Library	473
External dependencies of SPI Lcd Library	473
Library Routines	473
SPI_Lcd8_Config	474
SPI_Lcd8_Out	475
SPI_Lcd8_Out_CP	475
SPI_Lcd8_Chr	476
SPI_Lcd8_Chr_CP	476
SPI_Lcd8_Cmd	477
Available SPI Lcd8 Commands	477
Library Example	478
HW Connection	479
SPI T6963C Graphic Lcd Library	480
External dependencies of SPI T6963C Graphic Lcd Library	480
Library Routines	481
SPI_T6963C_Config	482
SPI_T6963C_WriteData	483
SPI_T6963C_WriteCommand	484
SPI_T6963C_SetPtr	484
SPI_T6963C_WaitReady	484
SPI_T6963C_Fill	485
SPI_T6963C_Dot	485
SPI_T6963C_Write_Char	486
SPI_T6963C_Write_Text	487
SPI_T6963C_Line	488
SPI_T6963C_Rectangle	488
SPI_T6963C_Box	489
SPI_T6963C_Circle	489
SPI_T6963C_Image	490
SPI_T6963C_Sprite	490
SPI_T6963C_Set_Cursor	491
SPI_T6963C_ClearBit	491

SPI_T6963C_SetBit	491
SPI_T6963C_NegBit	492
SPI_T6963C_DisplayGrPanel	492
SPI_T6963C_DisplayTxtPanel	493
SPI_T6963C_SetGrPanel	493
SPI_T6963C_SetTxtPanel	494
SPI_T6963C_PanelFill	494
SPI_T6963C_GrFill	494
SPI_T6963C_TxtFill	495
SPI_T6963C_Cursor_Height	495
SPI_T6963C_Graphics	495
SPI_T6963C_Text	496
SPI_T6963C_Cursor	496
SPI_T6963C_Cursor_Blink	496
Library Example	497
HW Connection	502
T6963C Graphic Lcd Library	503
External dependencies of T6963C Graphic Lcd Library	504
Library Routines	505
T6963C_Init	506
T6963C_WriteData	507
T6963C_WriteCommand	507
T6963C_SetPtr	508
T6963C_WaitReady	508
T6963C_Fill	508
T6963C_Dot	509
T6963C_Write_Char	509
T6963C_Write_Text	510
T6963C_Line	511
T6963C_Rectangle	511
T6963C_Box	512
T6963C_Circle	512
T6963C_Image	513
T6963C_Sprite	513
T6963C_Set_Cursor	514
T6963C_DisplayGrPanel	514