Communication 6015

Flytec AG
Electronic flight instruments
made in Switzerland
Ebenaustrasse 8a, CH-6048 Horw
Telefon 041 / 340 34 24
Telefax 041 / 340 54 24

Revision History

Firmware 6015	Description
V1.2.00	• New definition for test string
V1.1.21	• New Action 0x40 for Route • New Action 0x41 for Route • New Action 0x42 for Route • New Bits in FA Parameter 0x04 (Bits 6&7)
V1.1.20	• New definition of Action 0x20
V1.1.07	• New Action 0x30 for WP • New Action 0x31 for WP • New Action 0x32 for WP • New FA Parameter 0x15, 0x16, 0x1A & 0x1C • New Bits in FA Parameter 0x03 • New Bits in FA Parameter 0x04

Overview USB port

The instrument 6015 can communicate through the USB Mini B port, when it is in the running mode. The communication is based on an internal USB to RS232 driver from PROLIFIC (Type PROLIFIC 2303X). For this communication the COM ports settings on the PC side must be as follows

Baudrate	57600 Baud
Startbit	1
Data	8
Stopbit	1
No Parity	

The following commands are possible:

- Reading settings from the FA memory (FA Free Area)
- Write certain settings to the FA memory
- Actions
- Reading settings from the PA memory (Protected area)

Attention: Use always the correct command, otherwise data and settings will be deleted or overwritten.

Read settings from the FA memory

Send data to 6015:

```
RFA_XX\r\n
```

char[0..3]	RFA_ for “read FA-memory”
char[4..5]	Parameter number in ASCII-hex
char[6]	carriage return
char[7]	line feed

Answer from 6015:

```
RFA_XX_DD…DD\r\n
```

char[0..3]	RFA_ for “read FA-memory”
char[4..5]	Parameter number in ASCII-hex
char[6]	_ (underline)
char[7…]	Data in ASCII-Hex
char[n-1]	carriage return
char[n]	line feed

```
No Par\r\n
```

char[0..5]	“No Par” there are no data defined for this Parameter number
char[6]	carriage return
char[7]	line feed

Write settings to the FA memory

For enable writing to the FA memory, it is necessary to use action $82 first (See actions)

Send data to 6015:

```
WFA_XX_DD…DD\r\n
```

char[0..3]	WFA_ for “write FA-memory”
char[4..5]	Parameter number in ASCII-hex
char[6]	_ (underline)
char[7…]	Data in ASCII-Hex
char[n-1]	carriage return
char[n]	line feed

Answer from 6015:

```
WFA_XX_DD…DD\r\n
```

char[0..3]	WFA_ for “write FA-memory”
char[4..5]	Parameter number in ASCII-hex
char[6]	_ (underline)
char[7…]	Data in ASCII-Hex
char[n-1]	carriage return
char[n]	line feed

```
No Par\r\n
```

char[0..5]	“No Par” there are no data defined for this Parameter number
char[6]	carriage return
char[7]	line feed

```
not ready\r\n
```

char[0..8]	“not ready” missing the action $82
char[9]	carriage return
char[10]	line feed

Actions

Send data to 6015:

`ACT_XX_DD\r\n`

char[0..3]	ACT_ for “Action”
char[4..5]	Action number in ASCII-hex
char[6]	_ (underline)
char[7..8]	Parameter for this Action in ASCII-Hex
char[9]	carriage return
char[10]	line feed

The following actions are available :

Action number hexadecimal	Action	Answer from 6015	Needed time [Sec]
0x10	FA-Table	FA-Table	0.1
0x11	PA-Table	PA-Table	0.1
0x20	Flight book	Flight book	0.5
0x21	Get IGC Flight x	IGC-File	x
0x30	Delete all WP	Done	1
0x31	Read all WP	WP-List	x
0x32	Write 1 WP	xxx	0.125
0x40	Delete Route	Done	1
0x41	Read Route	Route-List	x
0x42	Write 1 new Route-WP	xxx	0.125
0x82	Write Enable FA Enables writing with the WFA_ Command. This is valid as long as the instrument is in the serial communication mode.	ACT_82_XX Done	0.01
0xBD	Device Type	Flytec 6015 IQ-Basic GPS	0.01

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FA-Table (Action $10):

Send data to 6015:

```
ACT_10_00\r\n
```

Answer from 6015:

```
     0;    16\r\n
     1;    16\r\n
     2;    16\r\n
     3;     2\r\n
     .
     .
 Done\r\n
```

In each line:

char[0..5]	FA field number “decimal”
char[6]	;
char[7..12]	Size of FA field “decimal”
char[13]	carriage return
char[14]	line feed

Last line:

char[0..6]	“ Done” Termination string

PA-Table (Action $11):

Send data to 6015:

```
ACT_11_00\r\n
```

Answer from 6015:

```
     0;     4\r\n
     1;     1\r\n
     2;     2\r\n
     3;     1\r\n
     .
     .
 Done\r\n
```

In each line:

char[0..5]	PA field number “decimal”
char[6]	;
char[7..12]	Size of PA field “decimal”
char[13]	carriage return
char[14]	line feed

Last line:

char[0..6]	“ Done” Termination string

Flight book (Action $20):

Send data to 6015:

```
ACT_20_00\r\n
```

Answer from 6015:

```
     0; 09.11.16; 12:43:03;        1; 00:08:53;     -161;      978;      452;        3.49;       -2.90;        1.38;not-set        ;not set        ;not set        r\n
     1; 09.10.09; 08:43:27;        1; 00:06:19;        0;      580;      233;        1.90;       -2.45;        0.77;not-set        ;not-set        ;not-set        r\n
       .
       .
       .
 Done\r\n
```

Firmware 1.1.20 :	No header line Speed max with a resolution of 0.01 m/s no space in the front of “Pilot name”, “Glider Type” & “Glider ID” “ Done” to highlight the end of the table

In each line:

char[0..5]	Flight number “decimal”
char[6]	;
char[7..15]	UTC date [YY.MM.DD]
char[16]	;
char[17..25]	UTC start time [HH:MM:SS]
char[26]	;
char[27..35]	UTC offset “decimal”
char[36]	;
char[37..45]	Flight time [HH:MM:SS]
char[46]	;
char[47..55]	Altitude offset “decimal” [m]
char[56]	;
char[57..65]	Altitude max “decimal” [m]
char[66]	;
char[67..75]	Altitude min “decimal” [m]
char[76]	;
char[77..88]	Vario max “decimal” 0.01[m/s]

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char[89]	;
char[90..101]	Vario min “decimal” 0.01[m/s]
char[102]	;
char[103..114]	Speed max “decimal” 0.01[m/s]
char[115]	;
char[116..131]	Pilot Name “string” [0..9, a..z, A..Z]
char[132]	;
char[133..148]	Glider Type “string” [0..9, a..z, A..Z]
char[149]	;
char[150..165]	Glider ID “string” [0..9, a..z, A..Z]
char[166]	carriage return
char[167]	line feed

Last line:

char[0..6]	“ Done” Termination string

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Flytec AG
Electronic flight instruments
Ebenaustrasse 18, CH-6048 Horw
Switzerland
fon +41 41 349 18 88
fax +41 41 349 18 99
www.flytec.ch
info@flytec.ch

Get IGC Flight (Action $21):

Send data to 6015:

```
ACT_21_0a\r\n
```

char[7..8] Flight number “hexadecimal”

Answer from 6015:

```
AFLY000A 00010\r\n
HFDTE091009\r\n
HFFXA010\r\n
HFPLTPILOT:not set          \r\n
HFGTYGLIDERTYPE: not set          \r\n
HFGIDGLIDERID: not set          \r\n
HFDTM100GPSDATUM:WGS84\r\n
HFRFWFIRMWAREVERSION: 1.1.07  Ger\r\n
HFRHWHARDWAREVERSION:1.00\r\n
HFFTYFRTYPE:Brauniger,IQ-Basic GPS\r\n
HFGPS:FASTRAX,IT321,20\r\n
HFPRSPRESSALTSENSOR:INTERSEMA,MS5401BM,12000\r\n
HFTZNUTCOFFSET:  1\r\n
HFATS1013.3\r\n
I033638FXA3940SIU4143TAS\r\n
F08320109122627\r\n
B0832014700785N00818451EA00573003300904000\r\n
F0832330912142627\r\n
E083233STA\r\n
B0832334700785N00818451EA00533003270000 5000\r\n
B0832044700785N00818451EA00328003290040 5000\r\n
B0832094700784N00818451EA00371003270040 5000\r\n
B0832004700784N00818451EA00333003270050 5000\r\n
    .
    .
B0838144700842N00818464EA00394004490010 6000\r\n
B0838194700842N00818464EA00394004490010 6000\r\n
GED0E339A2CDFC90374F664B36BA80B6DA5503AA490D896D0BE5F817012D9F997\r\n
```

IGC-File

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Delete all WP (Action $30):

Send data to 6015:

```
ACT_30_00\r\n
```

Answer from 6015:

```
 Done\r\n
```

char[0..6] " Done" all WP successful deleted
The answer needs about 1 second.

Read all WP (Action $31):

Send data to 6015:

```
ACT_31_00\r\n
```

Answer from 6015:

```
WP Name 1        ;N  47'00.847;E   8'18.466;  2000;    20\r\n
WP Name 2        ;S  23'15.543;W 110'58.489;   100;   400\r\n
   .
   .
 Done\r\n
```

In each line:

char[0..15]	WP-Name "text string" (see char for text string)	
char[16]	;	
char[17]	North/South indicator [N,S]	
char[18..19]	Space	
char[20..28]	Latitude [dd'mm.mmm]	
char[29]	;	
char[30]	East/West indicator [E,W]	
char[31]	Space	
char[32..41]	Longitude [ddd'mm.mmm]	
char[42]	;	
char[43..48]	Altitude "decimal" [m]	Range: -2000 to 10000
char[49]	;	
char[50..55]	Cylinder-Radius "decimal" [m]	Range: 20 to 200000 Step: 10
char[56]	carriage return	
char[57]	line feed	

Last line:

char[0..6]	" Done" Termination string

```
No Data\r\n
```

char[0..6]	"No Data" the WP list is empty
char[7]	carriage return
char[8]	line feed

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Write 1 WP (Action $32):

Send data to 6015:

```
ACT_32_00\r\n
WP Name 1        ;N  47'00.847;E   8'18.466;  2000;    20\r\n
```

Line 1 & 2 must be send within 100[ms].
In the second line:

char[0..15]	WP-Name “text string” (see char for text string)	
char[16]	;	
char[17]	North/South indicator [N,S]	
char[18..19]	Space	
char[20..28]	Latitude [dd’mm.mmm]	
char[29]	;	
char[30]	East/West indicator [E,W]	
char[31]	Space	
char[32..41]	Longitude [ddd’mm.mmm]	
char[42]	;	
char[43..48]	Altitude “decimal” [m]	Range: -2000 to 10000
char[49]	;	
char[50..55]	Cylinder-Radius “decimal”[m]	Range: 20 to 200000
char[56]	carriage return	
char[57]	line feed	

Answer from 6015:

```
 Done\r\n
```

char[0..4]	“ Done” new WP successful stored
char[5]	carriage return
char[6]	line feed

```
full list\r\n
```

char[0..8]	“full List” no place for a new WP
char[9]	carriage return
char[10]	line feed

```
Syntax Error\r\n
```

char[0..11]	“Syntax Error” something is wrong with the data
char[12]	carriage return
char[13]	line feed

```
already exist\r\n
```

char[0..12]	“already exist” the WP with this name does already exist
char[13]	carriage return
char[14]	line feed

Delete Route (Action $40):

Send data to 6015:

```
ACT_40_00\r\n
```

Answer from 6015:

```
 Done\r\n
```

char[0..6] " Done" Route successful deleted
The answer needs about 1 second.

Read Route (Action $41):

Send data to 6015:

```
ACT_41_00\r\n
```

Answer from 6015:

```
Route Name 1    ;N  47'00.847;E   8'18.466;  2000;    20\r\n
Route Name 2    ;S  23'15.543;W 110'58.489;   100;   400\r\n
    .
    .
 Done\r\n
```

In each line:

char[0..15]	Route Name "text string" (Name of the Route-WP)	
char[16]	;	
char[17]	North/South indicator [N,S]	
char[18..19]	Space	
char[20..28]	Latitude [dd'mm.mmm]	
char[29]	;	
char[30]	East/West indicator [E,W]	
char[31]	Space	
char[32..41]	Longitude [ddd'mm.mmm]	
char[42]	;	
char[43..48]	Altitude "decimal" [m]	Range: -2000 to 10000
char[49]	;	
char[50..55]	Cylinder-Radius "decimal" [m]	Range: 20 to 200000 Step: 10
char[56]	carriage return	
char[57]	line feed	

Last line:

char[0..6]	" Done" Termination string

```
No Data\r\n
```

char[0..6]	"No Data" there are no WP in the Route
char[7]	carriage return
char[8]	line feed

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Write 1 new Route-WP (Action $42):

Send data to 6015:

```
ACT_42_00\r\n
Route Name 1     ;N  47'00.847;E   8'18.466;  2000;    20\r\n
```

Each new WP will be added to the end of the route. Line 1 & 2 must be send within 100[ms].
In the second line:

char[0..15]	Route Name “text string” (Name of the Route-WP)	
char[16]	;	
char[17]	North/South indicator [N,S]	
char[18..19]	Space	
char[20..28]	Latitude [dd’mm.mmm]	
char[29]	;	
char[30]	East/West indicator [E,W]	
char[31]	Space	
char[32..41]	Longitude [ddd’mm.mmm]	
char[42]	;	
char[43..48]	Altitude “decimal” [m]	Range: -2000 to 10000
char[49]	;	
char[50..55]	Cylinder-Radius “decimal”[m]	Range: 20 to 200000
char[56]	carriage return	
char[57]	line feed	

Answer from 6015:

```
 Done\r\n
```

char[0..4]	“ Done” new WP successful stored
char[5]	carriage return
char[6]	line feed

```
full list\r\n
```

char[0..8]	“full List” no place for a new WP
char[9]	carriage return
char[10]	line feed

```
Syntax Error\r\n
```

char[0..11]	“Syntax Error” something is wrong with the data
char[12]	carriage return
char[13]	line feed

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Read settings from the PA memory

Send data to 6015:

```
RPA_XX\r\n
```

char[0..3]	RPA_ for “read PA-memory”
char[4..5]	Parameter number in ASCII-hex
char[6]	carriage return
char[7]	line feed

Answer from 6015:

```
RPA_XX_DD…DD\r\n
```

char[0..3]	RPA_ for “read PA-memory”
char[4..5]	Parameter number in ASCII-hex
char[6]	_ (underline)
char[7…]	Data in ASCII-Hex
char[n-1]	carriage return
char[n]	line feed

```
No Par\r\n
```

char[0..5]	“No Par” there are no data defined for this Parameter number
char[6]	carriage return
char[7]	line feed

Char for text string

0x20 SPACE	0x30 0	0x40 @	0x50 P	0x60 `	0x70 p
0x21 !	0x31 1	0x41 A	0x51 Q	0x61 a	0x71 q
0x22 “	0x32 2	0x42 B	0x52 R	0x62 b	0x72 r
0x23 #	0x33 3	0x43 C	0x53 S	0x63 c	0x73 s
0x24 $	0x34 4	0x44 D	0x54 T	0x64 d	0x74 t
0x25 %	0x35 5	0x45 E	0x55 U	0x65 e	0x75 u
0x26 &	0x36 6	0x46 F	0x56 V	0x66 f	0x76 v
0x27 ’	0x37 7	0x47 G	0x57 W	0x67 g	0x77 w
0x28 (	0x38 8	0x48 H	0x58 X	0x68 h	0x78 x
0x29)	0x39 9	0x49 I	0x59 Y	0x69 i	0x79 y
0x2A *	0x3A :	0x4A J	0x5A Z	0x6A j	0x7A z
0x2B +	0x3B ;	0x4B K	0x5B [	0x6B k	0x7B {
0x2C ,	0x3C <	0x4C L	0x5C \	0x6C l	0x7C |
0x2D -	0x3D =	0x4D M	0x5D]	0x6D m	0x7D }
0x2E .	0x3E >	0x4E N	0x5E ^	0x6E n	0x7E ~
0x2F /	0x3F ?	0x4F O	0x5F _	0x6F o	0x7F DEL

	Valid characters in a text string
	Not valid characters limited from 6015
	Not valid characters limited from IGC

Characters from 0x00 to 0x1f are not valid
Characters higher than 0x7f are not valid

FA-Table

FA-Nummer	Name	Description	Typ
0x00	Owner	Owner or Pilot name String [0..9, a..z, A..Z]	char[16]
0x01	AC_Type	Instrument type String [0..9, a..z, A..Z]	char[16]
0x02	AC_ID	Licence number or glider number String [0..9, a..z, A..Z]	char[16]
0x03	Units	Bit0 0=m 1=ft Bit1-2 Reserve Bit3 0=°C 1=°F Bit4 0=hPa 1=InHg Bit5 0=m/s 1=ft/min*100 Bit6-7 0=km/h 1=kts 2=mph Bit8 0=24h 1=12h Bit9-10 0=dd'mm.mmm 1=dd.dddd 2=dd'mm'ss Bit11 0=km 1=miles Bit12-15 Reserved	unsigned int bitfield

0x04	DiverseFlag	Bit0 AutoPower Down 0=Off 1=On Bit1 RisePitch 0=Lin 1=Exp Bit2 SinkAlarm 0=Off 1=On Bit3 Reserve Bit4 Alti display 0=Alti1 1=Alti2 Bit5 Line 4 display 0=Alti3 1=Time Bit6-7 Alti2 Mode 0=GPS 1=Flight Level 2=Alti1 other unit 3=Alti2 relative Bit8 Rise acoustic 0=Off 1=On Bit9 A3-Mode 0=Alti3 1=QNH Bit10 Flight end detection 0=Off 1=On Bit11 StallAlarm 0=off 1=On Bit12-15 Reserved	unsigned int bitfield
0x05	FiltTyp	Filter response delay Range 0 to 3 0=fast filter settings	unsigned char
0x06	Alt1Diff	Altitude difference to standard atmosphere for Alt1 Range -90000 to 90000[cm]	long
0x07	VarioDigFk	Filter setting for the digital filter Range 1 to 30[sec]	unsigned char
0x08	BFreqRise	Base frequency for lift audio Range 600 bis 1400[Hz]	unsigned int
0x09	BFreqSink	Base frequency for sink audio Range 300 to 1400[Hz]	unsigned int
0x0a	AudioRise	Threshold for lift audio Range 0 to 20[cm/s]	int
0x0b	AudioSink	Threshold for sink audio Range -10 to -2000[cm/s]	int
0x0c	SinkAlarm	Threshold for sink alarm Range -10 to -9990[cm/s]	int
0x0d	FreqGain	Frequency rise or gain for the audio Range 0 to 4 0=slow	unsigned char
0x0e	PitchGain	Pitch rise or gain for the audio Range 1 to 5 0=slow	unsigned char

0x0f	MaxRiseRejection	Time to reject the Min/Max calculation after flight recognition. (For towing) Range 0 to 3600[sec]	unsigned int
0x10	VarioMinMaxFk	Filter setting for the Min/Max calulation of the variometer Range 1 to 30[sec]	unsigned char
0x11	RecIntervall	Recording intervall Range 1 to 60[sec]	unsigned char
0x12	AudioVolume	Volume Range 0 to 4 0=Off 1=low	unsigned char
0x13	UTC_Offset	time zone offset Range -13 to 13[std]	char
0x14	PressOffset	Offset pressure sensor Range -1'000'000 to 1'000'000[mPa]	long
0x15	ThermThreshold	Threshold for last thermal detection Range 10 to 300 [cm/s]	int
0x16	PowerOffTime	Time until the instrument do power off itself Range 10 to 240 [min]	unsigned char
0x1a	StallSpeed	Stall speed Range 417 to 2778[cm/s]	unsigned int
0x1c	WindWheelGain	Gain for the wind wheel Range 50 to 150 [%]	unsigned char

PA-Table

PA-Nummer	Name	Description	Typ
0x00	DeviceNr	Serialnumber instrument	unsigned int
0x01	DeviceTyp	0=Flytec 6015 1=IQ Basic GPS	unsigned char
0x02	SoftVers	Software Version ilustartion x.x.xx	unsigned int
0x03	KalibType	0=Use default calibration 1=Use factory calibration	unsigned char
0x04	Filt1_K	Filter setting filter1 Number of measurements (x) for the avarager	unsigned char[4]
0x05	Filt2_K	Filter setting Filter2 Delay of the low pass filter tau=x/31	unsigned char[4]
0x06	Filt4_K	Filter setting Filter4 Delay of the low pass filter tau=x/7	unsigned char[4]
0x07	AudioHyst	Hysterese audio [cm/s]	unsigned char[4]
0x08	AudioRsThrFaktor	Threshold factor for the pre switch off of the audio	unsigned char[4]
0x09	BattLevel1	Batterie Level for Alcaline Batteries 1LSB = 16[mV]	unsigned char[10]
0x0a	BattLevel2	Reserved	unsigned char[10]
0x0b	BattLevel3	Reserved	unsigned char[10]
0x0c	AltiDiff_FLA	Altitude difference for flight recognition [cm]	long
0x0d	Vario_FLA	Vario threshold for flight recognition [cm/s]	int
0x0e	Speed_FLA	Speed threshold flight recognition [cm/s]	unsigned int
0x0f	MemoStartDelay	Reserved	unsigned char
0x10	Vario_FLE	Reserved	int
0x11	Speed_FLE	Reserved	unsigned int