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Ver.	Date	Summary of changes
1	2015-07-23	Initial version
1.01	2015-07-27	Minor editorial changes
1.02	2015-08-04	Added missing AUDIOOUT
1.03	2015-12-16	Changed Classic FLARM default range Added ADSBWARNINGS item Corrected track information in stealth mode Added Note to ADSBRANGE item
1.04	2017-03-08	Corrected PCASBEEP description Added TASK item Separated information items from configuration items Added BRIGHTNESS and BATTERYTYPE items
1.05	2017-08-24	Removed restriction for maximum number of characters in \$PFLAC,R,LIC THRE, ID, CAP, LIC, DEVTYPE and ADSBRANGE description and values changed HWVER and LIC deprecated Added new information item SWEXP Editorial changes

Scope and summary

The scope of this document is to provide a complete reference to the various configuration settings that can be applied to FLARM devices. It is primarily intended for developers integrating FLARM into their products (e.g. display manufacturers). It is not intended as a manual for end users. End users should instead use the configuration options offered by each manufacturer.

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1 Document Overview

The scope of this document is to provide a complete reference to the various configuration settings that can be applied to FLARM devices. It is primarily intended for developers integrating FLARM into their products. It is not intended as a manual for end users. End users should instead use the configuration options offered by each manufacturer.

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The document assumes prior knowledge of the NMEA 0183 version 2.0 protocol.

The most recent version of this document is available on www.flarm.com. You can also subscribe on our website to our newsletter in order to receive the latest news and firmware updates.

Suggestions to improve this document may be sent to info@flarm.com.

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2 Configuration Overview

All configuration settings are organized as key-value pairs where the key is a string and the value either a string, a number (integer or real), or a hexadecimal number represented as string. The key is not case-sensitive. The applicable range of valid values depends on the key and the target device. While most items can be both written and read, some are read-only (e.g. the serial number). Not all items are valid on all devices; e.g. if a transponder receiver is not present, the PCAS settings are invalid.

The canonical format to set and request configuration settings is the \$PFLAC format as described in FTD-12 FLARM Data Port Specification. In short, the format to set a configuration is:

```
> $PFLAC,S,<key>,<value>\r\n
$PFLAC,A,<key>,<value>*XX\r\n
```

Where XX is the checksum according to the NMEA 0183 standard, "\r\n" the newline sequence as used on Windows operating systems (0x0D0A) and ">" denotes the user input and is not part of the format. To request the current setting, issue:

```
> $PFLAC,R,<key>\r\n
$PFLAC,A,<key>,<current value>*XX\r\n
```

On most FLARM devices, the \$PFLAC format can be applied either on one of the serial ports or by means of a configuration file on the attached mass storage (SD card, USB) drive. Refer to the installation and operating manuals of the respective products for further details.

The value type and range for each item is specified separately. Values outside the given range should be ignored. The following naming is used:

- Integer: number which is written without a fractional component
- Fixed point: real number with a fixed number of digits after the radix point (dot)
- Decimal: number which has ten as its base (e.g. 123)
- Hexadecimal: integer number which has sixteen as its base (e.g. AF)
- String: a sequence of ASCII characters without NULL at the end
- Floating point: real number with an arbitrary number of digits (within limits as specified) after the radix point (dot)

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The following table shows all configuration items.

General Settings

ID	Sets the ICAO 24-bit aircraft address
NMEAOUT (NMEAOUT1, NMEAOUT2)	Configures which sentences are sent by FLARM on the data ports
BAUD (BAUD1, BAUD2)	Sets data port baud rate
ACFT	Sets aircraft type
RANGE	Sets maximum horizontal distance of received aircraft
VRANGE	Sets maximum vertical distance of received aircraft
PRIV	Disables/Enables stealth mode
NOTRACK	Disables/Enables opt-out option for ground tracking
THRE	Sets speed threshold below which no alarms are issued
LOGINT	Sets flight recording interval
PILOT	Sets pilot name (flight recording header information)
COPII	Sets co-pilot name (flight recording header information)
GLIDERID	Sets aircraft registration (flight recording header information)
GLIDERTYPE	Sets aircraft type (flight recording header information)
COMPID	Sets competition ID (flight recording header information)
COMPCLASS	Sets competition class (flight recording header information)
CFLAGS	Set special modes
UI	Disables/Enables integrated display and buzzer
AUDIOOUT	Disables/Enables audio output
AUDIOVOLUME	Sets volume on Audio Out connection
VOL	Sets volume on internal buzzer on PowerFLARM Portable
BATTERYTYPE	Sets the used battery chemistry/type.
BRIGHTNESS	Sets the brightness of PowerFLARM Portable display.
CLEARMEM	Removes obstacle database and IGC files from memory
CLEARLOGS	Clears all IGC files from the memory
CLEAROBST	Clears obstacle database from the memory
SAVE	Saves all setting to a file in the memory
LOAD	Loads settings from a file saved in the memory



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RM	Removes setting file from memory
DEF	Resets all settings to factory default

Transponder & SSR/ADS-B Receiver Settings

XPDR	Configures whether a transponder is installed and active on board
PCASPFLAU (PCASPFLAU1 , PCASPFLAU2)	Disables/Enables output of PCAS (non-directional) targets as PFLAU
PCASCALIBRATION	Sets PCAS antenna calibration value
PCASBEEP	Disables/Enables alarms and buzzer for non-directional targets
MODEC	Enables/Disables processing of Mode-C targets
OWNMODEC	Selects method for suppressing own Mode-C XPDR
MODESALT	Enables/Disables use of the barometric altitude received from the own Mode-S transponder
PCASRANGE	Sets PCAS horizontal range
PCASVRANGE	Sets PCAS vertical range
ADSBRANGE	Sets ADS-B horizontal range
ADSBVRANGE	Sets ADS-B vertical range
ADSBWARNINGS	Enables/Disables ADS-B warnings

IGC Approved Device Settings

NEWTASK	New task declaration (flight recoding header information)
ADDWP	Add to task declaration (flight recoding header information)
IGCSER	Sets IGC serial number



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Information Items (read only)

HWVER	Returns hardware version of device
DEVTYPE	Returns hardware version of device. More information than HWVER .
SWVER	Returns firmware version
SWEXP	Returns firmware expiration date
FLARMVER	Returns device type
BUILD	Returns software build number
SER	Returns the serial number of the device
REGION	Returns the region for which the device was made
RADIOID	Returns the ID type and ID used in the FLARM radio broadcast
CAP	Returns a list of features for the device
OBSTDB	Returns obstacle subsystem status
OBSTEXP	Returns obstacle database expiry date
LIC	Returns a list of installed and not installed licenses
LS	Returns a list of configuration files saved in memory
TASK	Returns information about the declared task

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3 Configuration Items

3.1 General Settings

3.1.1 ID

Description:

Read or set the ICAO 24-bit aircraft address which uniquely identifies the device. The ID cannot be changed when airborne, i.e. when moving. This is part of the radio broadcast data. It can also be set to FFFFFFF for automatic mode or to 0 for random mode.

The ICAO 24-bit address is available in the aircraft registration documents, and/or on the website of the local aircraft registration authority. If you are not sure what your ICAO 24-bit address is and do not have a Mode-S transponder, set it to FFFFFFF for automatic mode.

In automatic mode, the ID is related to the serial number of the device. This 24-bit number is built up similarly to the ICAO aircraft address system described in chapter 9 of ICAO Annex 10 Volume III.

In case of random mode, the ID will change at each startup. Note that this setting diminishes or disables tracking and search-and-rescue (SAR) capabilities. Should be used only with caution and when all the consequences are understood.

Devices:

All

Values:

One of the below values is possible:

Value	Description
Hexadecimal value	6 hexadecimal characters for official ICAO 24-bit aircraft address. Never set a value if not certain. Value must correspond to the aircraft in which FLARM is installed.
FFFFFF	Constant and unique FLARM-ID.

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0	Random ID; new after each startup. Not available when DEVTYPE = Flarm04.
----------	---

Default value:

FFFFFF

3.1.2 NMEAOUT (NMEAOUT1, NMEAOUT2)

Description:

Configure which sentences are sent by FLARM on the data ports. Do not change this setting unless really required, as multiple devices may be connected to the same port.

As specified in the table, adding 40, 60 or 70 to <value> selects the protocol version.

NMEAOUT configures the data port on which the command is received.

Additionally, on PowerFLARM-based devices with two data ports, items NMEAOUT1 and NMEAOUT2 work like NMEAOUT but configure a specific data port (No. 1 or No. 2).

Devices:

All

Values:

One of the below values:

Value	Description
0	no output
1	GPRMC, GPGGA, GPGSA plus FLARM proprietary sentences (incl. PGRMZ)
2	Only GPRMC, GPGGA, GPGSA but no FLARM proprietary sentences (incl. PGRMZ)
3	Only FLARM-proprietary sentence (incl. PGRMZ), but no GPRMC, GPGGA, GPGSA

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4	Garmin TIS (binary data at 9600 Baud; no other sentences). TIS license is required.
40-44	Like 0-4, but selects version 4/5 of the protocol.
60-64	Like 0-4, but selects version 6 of the protocol.
70-74	Like 0-4, but selects version 7 of the protocol.

Default value:

1

3.1.3 BAUD (BAUD1, BAUD2)

Description:

Sets the baud rate of the data¹ port. FLARM will first send the acknowledge sentence, and then switch immediately to the new rate. Note that when this sentence is used on an SD card or USB stick, the baud rate is changed only after restart.

BAUD configures the data port on which the command is received.

Additionally, on PowerFLARM-based devices with two data ports, items BAUD1 and BAUD2 work like BAUD but configure a specific data port (No. 1 or No. 2).

Devices:

All

Values:

One of the below values:

¹ Note that the standard NMEA 0183 baud rate is only 4.8 kBaud. Nevertheless, a lot of NMEA-compatible devices can properly work with higher transmission speeds, especially at 9.6 and 19.2 kBaud. As any sentence can consist of 82 characters maximum with 10 bit each (including start and stop bit), any sentence might take up to 171 ms (at 4.8k Baud), 85 ms (at 9.6 kBaud) or 43 ms (at 19.2 kBaud). This limits the overall channel capacity to 5 sentences per second (at 4.8k Baud), 11 msg/s (at 9.6 kBaud) or 23 msg/s (at 19.2 kBaud). If too many sentences are produced with regard to the available transmission speed, some sentences might be lost or truncated.



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Value	Description
0	4.8 kBaud
1	9.6 kBaud
2	19.2 kBaud
3	28.8 kBaud
4	38.4 kBaud
5	57.6 kBaud

Default value:

Default value is 2 (19.2kBaud), except when `DEVTYPE = Flarm04`, where default is 0 (4.8kBaud).

3.1.4 ACFT

Description:

Configures the aircraft type used by FLARM. This setting will affect the internal algorithms, as FLARM's motion prediction is aircraft type specific. This is also part of the broadcast data. The aircraft type configuration in FLARM must be set appropriately for tug / tow planes. The setting "tow / tug plane" results in a different warning behavior for gliders as long as a glider being towed is detected.

Warning: Contrary to the hexadecimal convention in `PFLAA`, the aircraft type is given as a decimal value here.

Devices:

All

Values:

One of the below values:

Value	Description
0	<i>reserved, do not use</i>
1	glider / motor glider



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2	tow / tug plane
3	helicopter / rotorcraft
4	skydiver
5	drop plane for skydivers
6	hang glider (hard)
7	paraglider (soft)
8	aircraft with reciprocating engine(s)
9	aircraft with jet/turboprop engine(s)
10	<i>reserved, do not use</i>
11	balloon
12	airship
13	unmanned aerial vehicle (UAV)
14	<i>reserved, do not use</i>
15	static object

Default value:

In PowerFLARM-based devices, the default value is 8 (aircraft with reciprocating engines). In Classic FLARM-based devices, the default value is 1 (glider/motor glider).

3.1.5 RANGE

Description:

Maximum horizontal distance of aircraft to be shown, in meters. This affects aircraft shown on displays, as well as PFLAU / PFLAA messages over the data port.

Devices:

All

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Values:

For PowerFLARM-based devices, unsigned decimal values between 2000 and 65535 (unlimited) are allowed. For Classic FLARM-based devices, unsigned decimal values between 2000 and 25500 are allowed.

Default value:

For PowerFLARM-based devices, the default value is 65535. For Classic FLARM-based devices, the default value is 25500.

3.1.6 VRANGE

Description:

Sets FLARM's receive vertical range in meters.

Devices:

PowerFLARM-based devices

Values:

Values between 500 and 2000 are possible.

Default value:

500

3.1.7 PRIV

Description:

Stealth mode. Instructs all receiving FLARM devices that the received data must not be made accessible in real-time full precision, except for the purpose of collision warning. Real-time is understood to be within less than 10 minutes. With the option set, not all information is forwarded to connected displays to prevent abuse in competitions. An activated stealth mode results in PFLAA sentences not carrying specific climb and cruise data while some random noise is applied to altitude data. It is recommended NOT to activate stealth mode! To apply full reciprocity, a pilot who enables stealth mode will only get information as if all other aircraft had enabled stealth mode, independent of their actual setting.

The status and changes to the stealth mode are recorded in the IGC file. Consequently, a competition authority can easily enforce the use (or non-use) if desirable. The table below presents the limitations in PFLAA sentences when stealth mode is enabled.

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Stealth mode cannot be changed during flight.

PFLAA parameter	Target when more than 2 km horizontal or 300 m vertical away	Target when closer than 2 km horizontal and 300 m vertical away	Target is very close or collision warning active
Target ID	Not available	Anonymous ID	Anonymous ID
Relative	Not available	Available	Available
Relative	Not available	Available with noise	Available
Climb rate	Not available	Not available	Available
Track	Not available	Available	Available
Speed	Not available	Not available	Available

Devices:

All

Values:

One of the below values:

Value	Description
0	Normal mode
1	Stealth mode activated Not recommended to use during normal flight!

Default value:

0

3.1.8 NOTRACK

Description:

Instructs third party receiving stations that (regardless of stealth mode setting) the received ID and position data must neither be stored nor made accessible in any time dimension (real-time, delayed, or archived) for any purpose. It is recommended NOT to enable this option! If enabled, it will impair logging service functionality and make Search and Rescue (SAR) impossible.

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Devices:

All

Values:

One of the below values:

Value	Description
0	Option is disabled
1	Option is enabled

Default value:

0

3.1.9 THRE

Description:

Sets speed threshold in m/sec below which the aircraft is treated as "on ground". In this mode, no warnings are given and other aircraft are not warned about own aircraft.



This setting is automatically changed to the ACFT-specific default, every time the ACFT setting is changed. If THRE is set manually, it must thus be set after setting ACFT, e.g. in the configuration file. Normally there is no reason to set THRE manually, unless e.g. operations are conducted where the aircraft is hovering for extended periods.

Devices:

All

Values:

Decimal integer values from 0 to 20 are allowed.

Default value:

The following are the ACFT-specific default values for THRE.



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ACFT value	Description	THRE default [m/s]
1	glider / motor glider	2
2	tow / tug plane	10
3	helicopter / rotorcraft	2
4	skydiver	5
5	drop plane for skydivers	10
6	hang glider (hard)	2
7	paraglider (soft)	2
8	aircraft with reciprocating engine(s)	10
9	aircraft with jet/turboprop engine(s)	10
11	balloon	0
12	airship	0
13	unmanned aerial vehicle (UAV)	2
15	static object	0

3.1.10 LOGINT

Description:

The value indicates the time interval in seconds between two data points in the flight recording. The longer the time interval is between two data points, the lower is the resolution of the recorded flight. For gliders and when a high resolution is required, do not use settings higher than 4s. FLARM should not be switched off immediately after landing to ensure that the whole flight is recorded.

The interval between two data points affects the recording capacity in terms of flight duration. The memory in FLARM devices is shared between the obstacle database and the flight recorder.

Devices:

All

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Values:

Decimal integer values from 1 to 8 are possible.

Default value:

On PowerFLARM-based devices, the default is 4. On Classic FLARM-based devices, the default is 2.

3.1.11 PILOT

Description:

The case-sensitive string defines header information (pilot name) for the flight recording.

Devices:

All

Values:

Maximum 48 ASCII characters.

Default value:

Empty on Classic FLARM-based devices and the string "undefined" on PowerFLARM-based devices.

3.1.12 COPIL

Description:

The case-sensitive string defines header information (co-pilot name) for the flight recording.

Devices:

All

Values:

Maximum 48 ASCII characters.

Default value:

Empty on Classic FLARM-based devices and the string "undefined" on PowerFLARM-based devices.

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3.1.13 GLIDERID

Description:

The case-sensitive string defines header information (aircraft registration) for the flight recording.

Devices:

All

Values:

Maximum 16 ASCII characters.

Default value:

Empty on Classic FLARM-based devices and the string "undefined" on PowerFLARM-based devices.

3.1.14 GLIDERTYPE

Description:

The case-sensitive string defines header information (aircraft type) for the flight recording.

Devices:

All

Values:

Maximum 32 ASCII characters.

Default value:

Empty on Classic FLARM-based devices and the string "undefined" on PowerFLARM-based devices.

3.1.15 COMPID

Description:

The case-sensitive string defines header information (competition ID) for the flight recording.

Devices:

All

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Values:

Maximum 16 ASCII characters.

Default value:

Empty on Classic FLARM-based devices and the string "undefined" on PowerFLARM-based devices.

3.1.16 COMPCLASS

Description:

The case-sensitive string defines header information (competition class) for the flight recording.

Devices:

All

Values:

Maximum 16 ASCII characters.

Default value:

Empty on Classic FLARM-based devices and the string "undefined" on PowerFLARM-based devices.

3.1.17 CFLAGS

Description:

Configures special modes. Make sure to read this setting before modifying it, as otherwise previously set configuration flags could be overwritten. If you do not understand the concept of bit flags, do not use this command!

Devices:

All

Values:

The sum of one or several of the below values:

Value	Description
0	No flags set

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1	Disable "INFO Alerts" on some Classic FLARM-based devices only. Not on data port.
2	Enable competition mode (reduced alarm distances and times)
4...255	Reserved. Do not use.

Default value:

0

3.1.18 UI

Description:

Deactivation of visual and/or aural output. Use only when a connected device handles the deactivated functionality. This value is not saved, i.e. it is lost after each restart. Note that no mode information is communicated from FLARM to connected devices (e.g. warning vs. nearest mode, sound volume, suppression modes), i.e. connected devices must maintain an own user dialogue for these settings.

Devices:

Classic FLARM devices with integrated user interface.

Values:

One of the below values:

Value	Description
0	Normal
1	FLARM to switch off LEDs and buzzer
2	FLARM to switch off only LEDs
3	FLARM to switch off only buzzer

Default value:

0

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3.1.19 AUDIOOUT

Description:

Enables/Disables audio output.

Devices:

All devices with Audio output.

Values:

Value	Description
0	Disable audio output
1	Enable audio output

Default value:

0

3.1.20 AUDIOVOLUME

Description:

Set volume on Audio output to the given percentage. Does not apply to the built-in buzzer in PowerFLARM Portable (use VOL instead). In addition, AUDIOOUT has to be set to 1 for AUDIOVOLUME to be valid.

Devices:

All devices with Audio output.

Values:

Decimal integer values from 0 to 100.

Default value:

100

3.1.21 VOL

Description:

Set volume on internal buzzer in PowerFLARM Portable. 0 turns off the buzzer.



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Devices:

PowerFLARM Portable

Values:

Decimal integer values from 0 to 3.

Default value:

3

3.1.22 BATTERYTYPE

Description:

Set the used battery chemistry/type. The device should not be operated with conjunction with any type of battery not listed here; other types may damage the device. If non-rechargeable batteries are used, do not connect the device to the charger.

Devices:

PowerFLARM Portable

Values:

Value	Description
0	Alkaline
1	Rechargeable

Default value:

0

3.1.23 BRIGHTNESS

Description:

Set the brightness of the display.

Devices:

PowerFLARM Portable

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Values:

Decimal integer values from 0 to 100.

Default value:

100

3.1.24 CLEARMEM

Description:

Removes the obstacles database and IGC files from memory

Devices:

Classic FLARM-based devices

Values:

No values

Example:

```
> $PFLAC , S , CLEARMEM
$PFLAC , A , CLEARMEM , 0
$PFLAC , A , CLEARMEM , 1
$PFLAC , A , CLEARMEM , 4
```

...

FLARM is asked to clear memory and it confirms that by sending response sentences with progress in percent and reboots at the end.

3.1.25 CLEARLOGS

Description:

Clears all IGC flight logs on the device and restarts the device.

Devices:

All PowerFLARM-based devices

Values:

No values

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3.1.26 CLEAROBST

Description:

Clears the obstacle database (if installed) and restarts the device.

Devices:

All PowerFLARM-based devices

Values:

No values

3.1.27 SAVE

Description:

Saves all settings to a file under <name>. A maximum of 40 settings files are supported.

Devices:

All PowerFLARM-based devices

Values:

Name of the file. The <name> may have a maximum of 10 ASCII characters. Allowed characters: Upper case letters A-Z, numbers, blank, hyphen and underscore.

Example:

```
> $PFLAC,S,SAVE,Settings01
```

```
$FILE,A,SAVE,OK*
```

FLARM device is asked to save settings to file and does so.

3.1.28 LOAD

Description:

Loads all settings from the file <name>.

Devices:

All PowerFLARM-based devices

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Values:

Name of the file. The <name> may have a maximum of 10 characters. Allowed characters: Upper case letters A-Z, numbers, blank, hyphen and underscore.

Example:

```
> $PFLAC,S,LOAD,Settings01
```

```
$PFLAC,A,LOAD,OK*
```

FLARM device is asked to load settings from the file and does so.

3.1.29 RM

Description:

Removes settings file <name>.

Devices:

All PowerFLARM-based devices

Values:

Name of the file. The <name> may have a maximum of 10 characters. Allowed characters: Upper case letters A-Z, numbers, blank, hyphen and underscore.

Example:

```
> $PFLAC,RM,Settings01
```

```
$PFLAC,A,RM,OK*
```

FLARM device is asked to remove file and does so.

3.1.30 DEF

Description:

Resets all device settings to default and restarts the device. Do not use data from the output.

Devices:

All

Values:

None

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3.2 ADS-B Device Settings

3.2.1 XPDR

Description:

Configures type of transponder that is installed.

If a Mode-S transponder is correctly configured (`$PFLAC`, `,XPDR`, `$PFLAC`, `,MODESALT`, and `$PFLAC`, `,ID`), PowerFLARM uses the altitude received from this transponder (external static) as a reference for vertical differences.

If disabled or no altitude has been received for more than 5 seconds, PowerFLARM uses the internal barometric sensor (cabin static).

A correctly configured Mode-S transponder must be used in aircraft with pressure cabins, and in case there is a significant difference between cabin and external static pressure.

Devices:

All devices with SSR/ADS-B module

Values:

One of the below values:

Value	Description
0	No transponder is installed
1	Mode-C
2	Mode-S

Default value:

0

3.2.2 PCASPFLAU (PCASPFLAU1, PCASPFLAU2)

Description:

Disables/Enables output of PCAS (non-directional) targets as `PFLAU`. See `PFLAU` message description in Data Port Specification for more information.

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PCASPFLAU configures the data port on which the command is received.

PCASPFLAU1 and PCASPFLAU2 work like PCASPFLAU but configure a specific data port (No. 1 or No. 2).

Devices:

All devices with SSR/ADS-B module

Values:

One of the below values:

Value	Description
0	Output of PCAS (non-directional) targets is disabled
1	Output of PCAS (non-directional) targets is enabled

Default value:

0

3.2.3 PCASCALIBRATION

Description:

Sets PCAS antenna calibration value. A higher value makes PCAS targets appear closer, in other words compensates for low antenna gain and/or a long cable.

Devices:

All devices with SSR/ADS-B module

Values:

Decimal integer values from 0 to 100.

Default value:

30



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3.2.4 PCASBEEP

Description:

Disables/Enables alarms and buzzer if non-directional (Mode-C/S) targets cross certain danger thresholds. Applies to the PowerFLARM Portable internal buzzer, and PowerFLARM Portable and PowerFLARM Core Audio Out.

Devices:

All devices with SSR/ADS-B module

Values:

One of the below values:

Value	Description
0	Disable alarms and buzzer on non-directional targets
1	Enable alarms and buzzer on non-directional targets

Default value:

1

3.2.5 MODEC

Description:

Enables or disables processing of Mode-C targets.

Devices:

All devices with SSR/ADS-B module

Values:

One of the below values:

Value	Description
0	Disable processing of Mode-C targets
1	Enable processing of Mode-C targets

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Default value:

1

3.2.6 OWNMODEC

Description:

Selects method for suppressing own Mode-C XPDR.

Devices:

All devices with SSR/ADS-B module

Values:

One of the below values:

Value	Description
0	Aggressive. May suppress other Mode-C targets on same altitude.
1	Less aggressive. May cause warnings from own Mode-C XPDR in case of e.g. reflected signals.

Default value:

0

3.2.7 MODESALT

Description:

Enables or disables use of the barometric altitude received from the own Mode-S transponder.

If enabled and a Mode-S transponder is correctly configured (\$PFLAC, ,XPDR and \$PFLAC, ,ID), PowerFLARM uses the altitude received from this transponder (external static) as a reference for vertical differences.

If disabled or no altitude has been received for more than 5 seconds, PowerFLARM uses the internal barometric sensor (cabin static).

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A correctly configured Mode-S transponder must be used in aircraft with pressure cabins, and in case there is a significant difference between cabin and external static pressure.

Devices:

All devices with SSR/ADS-B module

Values:

One of the below values:

Value	Description
0	Disables use of Mode-S altitude
1	Enables use of Modes-S altitude

Default value:

1

3.2.8 PCASRANGE

Description:

Sets the horizontal range of transponder-only equipped targets in meters.

Note: A PCASRANGE value of 0 will disable outputting transponder-only traffic as PFLAA sentences. To switch off transponder-only warnings, use PCASPFLAU setting.

Devices:

All devices with SSR/ADS-B module

Values:

Decimal integer values from 0 to 9260.

Default value:

7408 meters.

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3.2.9 PCASVRANGE

Description:

Sets the PCAS vertical range in meters.

Devices:

All devices with SSR/ADS-B module

Values:

Decimal integer values from 100 to 65535 (unlimited).

Default value:

610 meters

3.2.10 ADSBRANGE

Description:

Sets the ADS-B horizontal range in meters.

Note: An ADSBRANGE value of zero will disable outputting ADS-B traffic as PFLAA sentences. To switch off ADS-B warnings, use ADSBWARNINGS setting.

Devices:

All devices with SSR/ADS-B module

Values:

Decimal integer values from 0 to 65535 (unlimited).

Default value:

65535 (unlimited)

3.2.11 ADSBVRANGE

Description:

Sets the ADS-B vertical range in meters.

Devices:

All devices with SSR/ADS-B module

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Values:

Decimal integer values from 100 to 65535 (unlimited).

Default value:

65535 (unlimited)

3.2.12 ADSBWARNINGS

Description:

Enables or disables ADS-B warnings. When disabled, ADS-B targets will still be received and output on the data port, depending on the ADSBRANGE setting.

Devices:

All devices with SSR/ADS-B module

Values:

One of the below values:

Value	Description
0	ADS-B warnings are disabled.
1	ADS-B warnings are enabled.

Default value:

1

3.3 IGC Device Settings

3.3.1 NEWTASK (IGC approved devices only)

Description:

Starts a new task declaration. Any old task declaration will be cleared by this command. Take-off location, waypoints and landing location have to be added by consequently issuing "ADDWP" commands. To activate a new task declaration, the device must be power-cycled.

Note: For easy task declaration, use the free online-tool **FlarmCfg** (www.segelflug-software.de/flarmcfg/), the corresponding offline-version

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(www.segelflug-software.de/prod_flarmcfgtool.html), the free PDA software tools **SeeYou** and **ConnectMe** (<http://www.naviter.com/products/>) or **pocket*StrePla-Connect** (www.strepla.de/StrePla4/english/pS_connect/), and many of the other products on the market. Note that task declaration only works on IGC-enabled devices.

Devices:

All devices with an IGC Approved Recorder

Values:

Text description of task, e.g. "500km triangle". Can be the empty string. Maximum 50 ASCII characters.

Example:

```
> $PFLAC,S,NEWTASK,My Task
```

```
$PFLAC,A,NEWTASK,My Task*
```

New task "My task" was declared.

3.3.2 ADDWP (IGC approved devices only)

Description:

Adds a waypoint to the current task declaration. The first and the last waypoint added will be treated as takeoff and landing location, respectively. If no takeoff or landing location is to be given, zero coordinates should be entered (0000000N, 00000000E). The format closely follows the IGC file specification².

The total data size entered through this command may not surpass 192 bytes when calculated as follows:

$$7 + (\text{Number of Waypoints} * 9) + (\text{sum of length of all task and waypoint descriptions})$$

Devices:

All devices with an IGC Approved Recorder

² www.ukiws.demon.co.uk/GFAC/documents/tech_spec_gnss.pdf

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Parameters:

Below parameters must be set:

Parameter	Value	Description
Latitude	7-digit decimal integer ending with N (north) or S (south)	Latitude of waypoint. Must be given the format "DDMMmmmN", where DD designates degrees, MM minutes and mmm 1/1000 minutes. All digits are required and have to be filled with zeros, if applicable. The last character is either "N" for north or "S" for south.
Longitude	8-digit decimal integer ending with E (east) or W (west)	Longitude of waypoint. Must be given the format "DDDMMmmmE", where DDD designates degrees, MM minutes and mmm 1/1000 minutes. All digits are required and have to be filled with zeros, if applicable. The last character is either "E" for east or "W" for west.
Description	Waypoint Description	Arbitrary text description of waypoint. Max 50 characters.

Example:

```
> $PFLAC,S,ADDWP,5024200N,00631440E,Some Airport
$PFLAC,A,ADDWP,5024200N,00631440E,Some Airport*
> $PFLAC,S,ADDWP,495900N,00631440E,My Start Line
$PFLAC,ERROR*
```

The second request causes FLARM to issue an error, since the number format is invalid.

3.3.3 IGCSER (IGC approved devices only)

Description:

IGC serial number. The IGC serial can be set on Classic FLARM-based devices only, and only once.

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Devices:

All devices with an IGC Approved Recorder

Values:

IGC serial number. Max. 3 characters.

Example:

```
> $PFLAC , S , IGC SER , 27
```

```
$PFLAC , A , ERROR*
```

FLARM is asked to set IGS serial but FLARM cannot do it because it was already programmed.

Example:

```
> $PFLAC , R , IGC SER
```

```
$PFLAC , A , IGC SER , ADY*
```

FLARM is asked to give IGS serial number.

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4 Information Items (read only)

4.1.1 HWVER

Description:

Deprecated

Returns the hardware type of the device. Gives less information than DEVTYPE (doesn't distinguish between various PowerFLARM-based devices).

Devices:

All

Values:

String. Maximum 18 ASCII characters.

4.1.2 DEVTYPE

Description:

Returns the hardware type of the device. In comparison to HWVER, DEVTYPE distinguishes between different PowerFLARM-based devices.

Devices:

All

Values:

String. Maximum 30 ASCII characters.

The following table shows which device types are currently available, and to which device category they belong.

Device Category	Device Type (DEVTYPE)
PowerFLARM-based	PowerFLARM-Core
	PowerFLARM-Portable
	PowerFLARM-AM
Classic FLARM-based	Flarm04
	Flarm05
	Flarm06
	Flarm-IGC05



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	Flarm-IGC06
	FLYTEC
	LX_IGC08
	LX06
	LX06_FR
	LXV
	LXV_FM
	LXV_FM_IGC
	OZ06
	OZ_IGC
	TRXFLM
	SOMAX

4.1.3 SWVER

Description:

Returns the firmware version of the device.

Devices:

All

Values:

Decimal floating-point value. Maximum two digits before radix point (dot) and maximum 4 digits after.

4.1.4 SWEXP

Description:

Returns the firmware expiration date.

Devices:

All except when DEVTYPE = Flarm04

Values:

String. Format: d.m.yyyy

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4.1.5 FLARMVER

Description:

Returns the bootloader version.

Devices:

All

Values:

Decimal floating-point value. Maximum one digit before radix point (dot) and maximum 2 digits after.

4.1.6 BUILD

Description:

Returns the build number of the firmware.

Devices:

All

Values:

Maximum 20-digit decimal integer.

4.1.7 SER

Description:

Returns the serial number of the device.

Devices:

All

Values:

On PowerFLARM-based devices, maximum 6 digit decimal integer. On Classic FLARM-based devices, maximum 10-digit decimal integer.

4.1.8 REGION

Description:

Returns the region in which the device can be used.

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Devices:

All except when DEVTYPE = Flarm04

Values:

String. The following values are currently possible:

Value	Description
ALL	The device will work everywhere
EUR	SRD860 version. Will operate in Europe, Asia (except Israel), Africa, and New Zealand
USA	ISM version. Will operate in North America, South America, Israel, and Australia.

4.1.9 RADIOID

Description:

Returns the ID type and ID used in the FLARM radio broadcast. The ID type is defined as in PFLAA.

Devices:

All

Parameters:

Below parameters are returned:

Parameter	Value	Description
ID Type	1	ID type: ICAO 24-bit aircraft address
	2	ID type: FLARM ID
ID	6 hexadecimal characters	ID used for radio communication

Example:

```
> $PFLAC,R,RADIOID
```


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\$PFLAC , A , RADIOID , 1 , A832ED*

FLARM is asked about ID which is used for communication and it answers that the type is 1 and ID is A832ED.

4.1.10 CAP

Description:

Returns a list of features for the device. Some features are optional and require a license. New features may be defined at any time. Feature capability codes are separated by a semicolon (;).

Devices:

All except DEVTYPE = Flarm04

Values:

String with ASCII characters. Individual capability strings are limited to 4 characters and separated by semicolon. Currently possible features are:

Value	Description
AUD	Audio output connection
AZN	Alert Zone Generator
BARO	Barometric sensor
BAT	Battery compartment or built in batteries
DP2	Second Data Port
ENL	Engine noise level sensor
IGC	Device can be IGC approved
OBST	Device can give obstacle warnings if database is installed and license is valid
TIS	Interface for Garmin TIS
SD	Slot for SD cards
UI	Built-in UI (display, possibly button/knob)
USB	Slot for USB sticks
XPDR	SSR/ADS-B receiver
RFB	Second radio channel for antenna diversity
GND	Device can operate as receive-only ground station



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Example:

```
> $PFLAC , R , CAP
```

```
$PFLAC , A , CAP , OBST ; IGC ; SD ; BARO *
```

FLARM device has an obstacle database installed IGC approved recorder, SD card slot and barometric sensor.

4.1.11 OBSTDB

Description:

Returns obstacle subsystem status

Devices:

All

Parameters:

Below parameters are returned:

Parameter	Value	Description
Version	1	Currently always set to 1.
Status of the obstacle subsystem	0	Disabled
	1	Normal operation
	2	Failure
	3	No database installed
	4	Internal database inconsistency
	8	No license
	9	Invalid license
	16	Wrong database version
Name	Max. 32 characters	Obstacle database name
Date	Max. 32 characters	Obstacle database creation date

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Example:

```
> $PFLAC,R,OBSTDB
```

```
$PFLAC,A,OBSTDB,1,1,alps20110919_,28.09.2011*
```

FLARM is asked about obstacle database information and responds with obstacle database name and creation date.

4.1.12 OBSTEXP

Description:

Returns the obstacle database expiry date if database is available. Otherwise it returns error.

Devices:

All except when DEVTYPE = Flarm04

Values:

Expiration date in the following format: YYYY-MM-DD

Example:

```
> $PFLAC,R,OBSTEXP
```

```
$PFLAC,A,ERROR *
```

FLARM is asked about expiration date of obstacle database but the database is not installed on this device.

Example:

```
> $PFLAC,R,OBSTEXP
```

```
$PFLAC,A,2014-03-31*
```

FLARM is asked about expiration date of obstacle database and answers with the expiration date.

4.1.13 LIC

Description:

Deprecated

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Returns list of all possible licenses. Licenses which are already installed are indicated by number 1 following the name of the license. Not installed licenses are followed by 0. New licenses may be defined at any time.

Devices:

All PowerFLARM-based devices

Parameters:

The following parameters are returned for each license, separated by semicolon. The license type and license status are separated by colon.

Parameter	Value	Description
License type	AUD	External Audio connection
	ENL	Engine noise level sensing
	AZN	Alert Zone Ground Station
	IGC	IGC approved flight recording
	RFB	Activation of second antenna
	TIS	Garmin TIS protocol output
	GND	Receive-only Ground Station
	SD	Activation of SD card functionality
	USBH	Activation of USB functionality
	PRE	Activation of pressure sensor functionality
	L6S	Activation of LEA-6S GPS module
	EXG	Activation of external GPS connection
License status	0	License not installed
	1	License installed

Example:

```
> $PFLAC,R,LIC
```


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\$PFLAC , A , TASK , C5024200N00631440EZug*

\$PFLAC , A , TASK , C5014200N00631540EAirport*

FLARM is asked to output the declared task information and does so.