ACARS CPDLC Quick Starter

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Edition 1.2.2

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1. INTRODUCTION

Welcome to the ACARS CPDLC Quick Starter Manual!

This document is about ***CPDLC (Controller Pilot Data Link Communication)*** on ***VATSIM***. CPDLC, basically a text based communication method used between pilots and air traffic controllers, is becoming more and more common in the real world.

This manual is meant to help promote the use of CPDLC on VATSIM as it will enhance the feel of realism of a growing number of flight simulation enthusiasts and will make events with a large amount of communication (e.g. Cross The Pond) more manageable and enjoyable for all participants. So far only few members are aware of what CPDLC is at all and many of those who have heard about it have a hard time getting started with the software and the basics about CPDLC.

This document will **not** discuss details about the technology itself, but rather describe the correct setup and basic handling of the software that is required. If you would like to find out more about CPDLC and the associated procedures, please jump to ***CHAPTER 5*** of this manual. You'll find a list of web resources that cover these topics.

For our purposes we make use of the ***ACARS network of "Hoppie"***. Jeroen Hoppenbrouwers from The Netherlands is the kind and talented gentleman who has created and shared this piece of software and the associated server ***free of charge***. We at VATSIM are extremely grateful for this!

The ACARS CPDLC Quick Starter Manual will describe ***two*** different ***sets*** of software ***for pilots*** and ***two programs*** for ***air traffic controllers***. As more programs will be made available in the near future, this manual is going to be amended as soon as possible.

Note: when it comes to the subject of ***Pre Departure Clearances (PDC)***, the operation described in the following pages is not 100% realistic, but rather a hybrid-function. By principle there are PDCs and ***DCLs (CPDLC Departure Clearance)***. PDCs work through ACARS as plain text messages and normally require pilots to make a readback of the assigned transponder code on voice. DCLs work strictly through CPDLC in a set format and an acknowledgement by means of CPDLC is sufficient. In our world we mix those two types of technologies: PDC requests are sent by ACARS as plain text, but the reply will come through CPDLC in a set format, but ***no logon is required***. This way ATC will accept PDCs being acknowledged by CPDLC. There may be local procedures that dictate a readback on voice. This should be communicated by ATC in their clearances or elsewhere.

There is one fundamental difference between CPDLC and PDC/ACARS that users need to be aware of: ***PDC requests and ACARS messages are sent as plain text messages (Telex)*** and you do not require a logon to an ATC channel before being able to send such messages, only the recipient's address. CPDLC, on the other hand, requires pilots to logon to an ATC-channel before being able to send or receive such a type of message, with the exception being a PDC-message from ATC.

2. HOPPIE LOGON CODE

If you would like to use CPDLC services, you have to ***request a LOGON CODE***, which is ***free of charge***. This unique code will identify you as an authorized user at Hoppie's ACARS server.

To obtain such a LOGON CODE, proceed to **Hoppie's Website** and register by entering your ***full name*** and your ***e-mail address***. Your personal code will then be e-mailed to you within seconds and it will expire after 120 days of non-usage. Should your logon code ever expire, simply register once again.

In case that you have lost your logon code, try to register again with the same e-mail address as before. If your code is still valid, it will get e-mailed to you.

3. SOFTWARE FOR PILOTS

3.1 Definitions

3.1.1 Callsign

The golden rule is that you ***always*** use ***exactly the same*** callsign that you are ***logged in with to VATSIM*** at that time.

3.1.2 Flightplan Remarks

You also want to identify yourself as a pilot that is able to communicate with CPDLC. While it would be top realistic if you used the **official ICAO-codes** (click on Radio Communication) for your equipment, it would be more straight forward if you also put your CPDLC-capability into your flightplan remarks field and used plain words to do it. So far, ATCOs are not used to CPDLC and may not be aware of all those special equipment codes. If you check out the list of available codes on the website linked in this paragraph, you will realize why.

It is therefore suggested to ***add the following to your flightplan remarks field:*** `COM/CPDLC PDC`.

3.2 Hoppie's ACARS Airborne Client

The original program for pilots was created by Hoppie; it is the **ACARS Airborne Client**. This standalone program resembles the brown MCDU (Multi-function Control and Display Unit) usually found in Boeing aircraft. It does, however, work for any type of aircraft that you fly in any flight simulator, because it is a separate program that you will only use to communicate with ATC, receive weather and ATIS and possibly chat with other pilots who are also online through Hoppie's ACARS network.

3.2.1 Download

Download the following 3 files and install them in the correct sequence.

- **ALL IN ONE INSTALLER (file size 5.4 Mb)**
- Version 1.9 of **ACARS Airborne Client (file size 1.5 Mb)**
- Version 2.31 of **MCDU (file size 2.7 Mb)**

3.2.2 Installation

If you are using Windows 7 or higher, make sure that you install all programs **"As Administrator"**, otherwise they will not be registered correctly and you may have to start over.

First install `acars-msfs-1.1-install.exe` into any directory on your computer. I suggest creating a directory called "ACARS" into which you will install all relevant programs.

The **second** program to install is `acarsair-1.9-install.exe`.
Make sure you select the directory `\prg` of your existing ACARS-MSFS folder and overwrite the previous version of acarsair: `..\ACARS-MSFS\prg\`

As **last** item run `mcdu-2.31-install.exe` and also install it into "prg": `..\ACARS-MSFS\prg\`

3.2.3 Setup

Setting up the program is pretty easy!

Previous versions of the CPDLC Quick Starter Manual suggested not running the program ***wfacars***. Actually this seemed to be wrong, since this piece of software is needed to enable pilots to properly send position reports to Air Traffic Controllers. In case that you just installed the **ACARS Airborne Client** from scratch, there's nothing that you need to do about it.

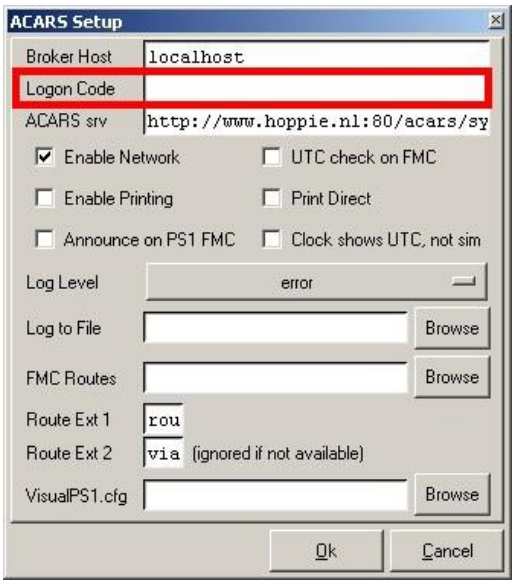
But in case that you have modified the file `start_acars.bat` previously, just edit it again through the Windows File Explorer. Proceed to the directory of `..\ACARS-MSFS\` and open the file called `start_acars.bat` with any text editor program. **Remove** the word **rem** at the beginning of the two lines as shown in the screenshot. This will make the batch file not ignore those entries anymore.

Now save the file and close it.

```
@echo off
echo Starting the ACARS system...

echo Starting Broker...
start prg\broker\bin\broker

echo Starting MCDU...
start prg\mcdu\mcdu

echo Starting ACARS Client...
start prg\acarsair\bin\acarsair

rem echo Starting MSFS interface...
rem start prg\wfacars\wfacars

echo ACARS system started.
```

Continue by starting the ***ACARS Airborne Client*** by using the ***shortcut ACARS MSFS*** (which in turn will execute **`start_acars.bat`**. When selecting it, the programs ***ACARS Airborne Client*** (connects directly to the Hoppie ACARS server), ***MCDU*** (the interface for pilots to send/receive messages to/from the Hoppie ACARS server through ACARS Airborne Client) and ***747 Broker*** (connects the MCDU and the ACARS Airborne Client) will start automatically.

Note: should you wish to ***restart*** the ***MCDU***, then make sure that you also shutdown ***ACARS Airborne Client*** and ***747 Broker*** before running the ***ACARS MSFS shortcut***. This is essential for the correct operation of these programs.



Should the ***ACARS Airborne Station*** not open up its setup dialogue automatically, open it manually through "File" menu and then "Setup".

All we need to do here is paste our personal Hoppie ACARS ***LOGON CODE*** that we have obtained in ***CHAPTER 2*** of this manual. Click OK to save it and minimize the windows of ***ACARS Airborne Station*** and ***747 Broker***.

3.2.4 Operation

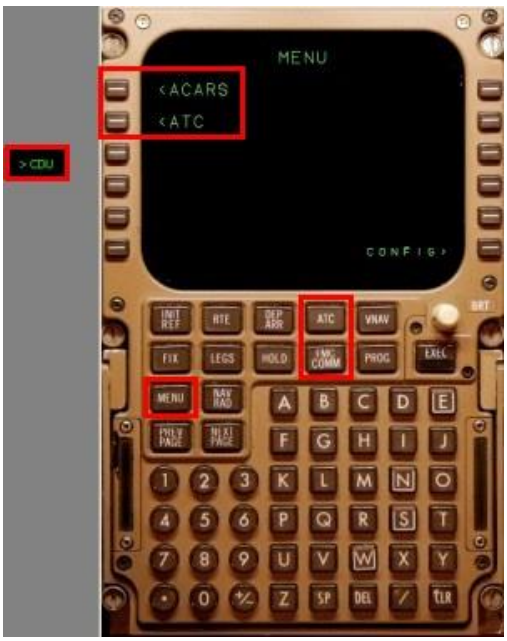
We are going to work with the MCDU from now on.

On the MCDU itself only 3 menu buttons do work: **MENU**, **ATC** and **FMC COMM**.

MENU: index page where you can choose between **ACARS** and **ATC**.

ATC serves as a shortcut to **ATC**.

FMC COMM takes you directly to **ACARS**.



The position of the MCDU can be changed by placing the mouse icon over it, holding down the **RIGHT** mouse button and then moving it.

The icon **> CDU** is your shortcut to the MCDU.
Double-clicking hides/restores the MCDU and with a ***right-click*** you will see an option to close the MCDU for good.
You can move this icon to anywhere on your screen(s), it will always stay on top for quick access to the MCDU.

3.2.4.1 Setting callsign and logging on to an ATC channel

The first thing that you ***need to do*** ***before each and every flight*** is ***enter your correct Flight ID. This is your callsign!*** Obviously it has to ***match*** ***exactly*** the callsign that you are using when **logging in to VATSIM**.

To do so, select the LSK next to **ATC** to access the page **ATC LOGON/STATUS**.

Boeing calls the Flight ID **FLT NO** (flight number).

In this example you are DLH1234. Type it into the scratchpad of the MCDU (you can also use your keyboard) and then select the LSK next to **FLT NO**. Once this is done, you can observe the status indicator at the right-hand bottom corner of the ***ACARS Airborne Station*** turn **GREEN**, you are connected to Hoppie's ACARS server and ready to communicate!

Caution: please ***be aware*** of the ***difference between CPDLC and ACARS/PDC***. Essentially CPDLC communication between controllers and pilots is limited to a pre-defined set of phrases, while ACARS and PDC request messages are sent as plain text messages, called Telex. A number of different PDC-programs are in use by ATCOs and at least one of them, ***vSMR (a pure PDC-client)***, is ***NOT*** able to process logon requests. As a consequence you won't be able to communicate correctly should you request to logon to an ATCO using vSMR.

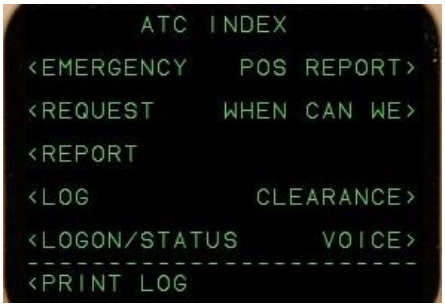
Again: To send a ***PDC request or a free text message*** to an ATCO, you ***SHOULD NOT*** logon to his channel!

To connect to an ATC-station you simply have to enter its ***four letter*** ***CPDLC identifier*** into the field **LOGON TO**.

To connect to the station Langen Radar, use its code **EDGG**. ATCOs distribute CPDLC identifiers through their **controller information**.
Once you have entered **EDGG** below **LOGON TO**, you will be presented with the option **SEND**. Press the LSK to the right of it and observe the text changing to **SENDING** and then to **SENT**.

Once the ATCO has received your request to logon to his channel, he will accept it and you are going to receive an ***UPLINK*** message in your scratchpad, telling you **ATC COMM ESTABLISHED** and the field **ACT CTR** (actual center) will indicate the station that you are currently connected to.
If you would like to leave this channel, simply use the LSK next to **ATC COMM SELECT OFF**.

3.2.4.2 ATC Request Options



Select **INDEX** to see all your communication options, I suggest you explore them all. Some good information about these functions can also be found under **THIS LINK**.

3.2.4.3 PDC and ACARS

Let's have a look at our ACARS pages and use **MENU** or **FMC COMM** to access them.
On the first page you can ***enter your flight data***. It is also possible to set/change your callsign on this page – the information will be transferred to the ATC LOGON page automatically. Mainly we have two further pages of interest: **RECEIVED MESSAGES** and **REQUESTS**.

Selecting **REQUESTS** takes us to some more options. Relevant for us are **PDC**, **WEATHER** and **ATIS**.

PDC stands for Pre-Departure Clearance.
If *clearance delivery* is available via ACARS, you can use this function to request your clearance instead of calling ATC on voice and for it to work you have to fill in a couple of fields to make it work. Please note that you do ***NOT*** need to logon to an ATCO channel ***before*** requesting your ***PDC***. It actually may cause the function to stop working for you.

Follow **THIS LINK** to read a pictorial beginners guide for this function. On top of it there is a video demonstrating the interaction between Hoppie's MCDU and the vSMR-Plugin in EuroScope: **YouTube Video**.

WEATHER gives us access to METARs and TAFs and is pretty self-explanatory.

Note: if you complete the fields for airport of departure, arrival and your alternate on **ACARS PREFLIGHT** then they will be available as quick-links on this page.

If you wish to request the METAR/TAF of any other airport, insert it into the scratchpad and use the LSK next to **AIRPORT - - - - >**.

ATIS holds a nice surprise: it is possible to request ***VATSIM ATIS*** stations that are active at the time of request!

In this example **EGKK** was inserted into the field **AIRPORT** and then the LSK next to **REQUEST VATSIM ATIS** was pressed. If the requested airport has a VATSIM ATIS available then you are going to receive a message. You can access it through **RECEIVED MESSAGES**.

Note: if you complete the fields for airport of departure, arrival and your alternate on **ACARS PREFLIGHT** then they will be available as quick-links on this page.

RECEIVED MESSAGES now lists a message from **EGKK**, titled **ATIS**. To read it, press on the LSK on the left side of that line.

Finally we can read the VATSIM ATIS for EGKK London Gatwick!

There are many more functions available and you should take your time to explore them, it won't take you more than a couple of minutes. If you would like to play with the MCDU functions before using it during an online flight, jump to ***CHAPTER 4*** of this manual and run ***Hoppie's ATC Client*** that is described there. You can take the roles of ATC and pilot at the same time and test the interaction of both programs.

Note: should you get annoyed by a ***growing number of historic messages*** that are listed in **RECEIVED MESSAGES** then there is an easy fix!
On the page **ACARS PREFLIGHT** simply press the Line Select Key (LSK) on the top left, next to the empty line. You should then see a new option **CONFIRM** and by pressing on the same LSK again, you will erase all entries on that page and all historic messages, too.

3.3 Project A330 CPDLC AOC Client

Born from Christoph Paulus' **Project A330**, an Airbus A330 home cockpit simulator in Germany, we have the pleasure of using his CPDLC client that comes in the looks of Airbus avionics.

3.3.1 Download

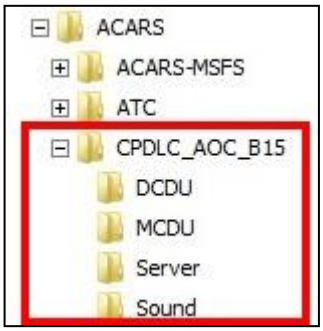
Go to **CPDLC AOC-Client** and click on **`Aktuelle Version (Beta 16) herunterladen`** (file size 0.9 Mb). Should you have installed ***B15*** already, you actually do ***not*** need to install B16.

Additionally, the website contains links to ***3 tutorial videos*** that Christoph has made. He goes into detail about his program and if you need more help than what is covered in this manual, it is recommended to check out those tutorials.

3.3.2 Installation

If you are updating from Beta 14 to Beta 16, then you will only have to install the files **`CPDLC AOC Server.exe`** and **`CPDLC AOC Server.exe.config`** into the subdirectory **`..\Server`**.
Now jump to ***CHAPTER 3.3.3*** and add the entry **`CompanyMsgMemoOnScratchpad=True`** .

If this is your first installation of this program, simply **unZIP** the contents of **`CPDLC_AOC_B16.zip`** into a directory of your choice. In case that you have already created a folder called ACARS, why not install the program into it.



As a result you will see the program folder itself and 4 subfolders.

It is **highly recommended** to get your hands on a set of more or less up to date navigation data files for ***Level-D B767***. Suppliers are Navigraph and Aerosoft.
Place the files **`AIRPORTS.dat`**, **`FMC_Ident.txt`**, **`WPNAVAID.txt`** and **`WPNAVFIX.txt`** into the directory **`..\CPDLC_AOC_B16\Server`** .

As a last step install the ***3 fonts*** that CPDLC AOC Server comes with. You'll find them in the folder **`..\CPDLC_AOC_B16\Server`** and they are called **`CockpitDCDU.ttf`**, **`CockpitMCDU.ttf`** and **`CockpitPrinter.ttf`**. To install them, right-click on each of them and select **`Install`**.

3.3.3 Setup

Remain in the folder **`..\CPDLC_AOC_B16\Server`** and open the file **`Server.ini`** in any text editor.

We need to enter our personal Hoppie ACARS ***LOGON CODE*** into the line **`LogonCode=`** . See ***CHAPTER 2*** of this manual if you need to request it yet.

```
[Config]
LogonCode=
ServerIP=192.168.1.40
CompanyMsgMemoOnScratchpad=True

ACRegistr=D-TEST
ALIdent2=LH
ALIdent3=DLH
;0=VATSIM 1=IVAO
ATISSource=0
```

For **`ACRegistr=`** you can insert the registration mark of your virtual aircraft. *D-TEST* was used in this example.
`ALIdent2=` is the 2-letter ***IATA-code*** of your airline/operator. Enter something meaningful here, you can still change it from within the CPDLC user interface. In this example Lufthansa's code **LH** was used.

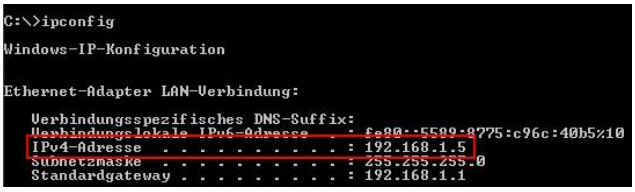
`ALIdent3=` is the 3-letter ***ICAO-code*** of your airline/operator. Enter the ICAO-code of the airline/operator that you used in the variable **`ALIdent2=`** , in this case it is **DLH**.

Note: if you are not sure about those codes, visit **rzjets** and search for the codes of your airline/operator.

If you are updating from version B14 to B16, you may need to insert the option **`CompanyMsgMemoOnScratchpad=True`**. If you receive a new ACARS message, you will now receive a notification on the scratchpad of your FMGC.

Finally and ***most importantly*** you need to fill in **`ServerIP=`** with the ***IP-address*** of the computer on which the server is installed. You ***must not*** use **`127.0.0.1`** or **`localhost`**, but the ***full LAN-IP-address*** of this computer, for example **`192.168.1.5`**.

If you do not know how to find your computer's IP-address, follow these instructions: select ***Windows START menu***, type in ***"cmd"*** and start the ***command line box***. In it type "***ipconfig"*** to receive the required information.



Once you have entered the IP-address as **`ServerIP=`** into **`Server.ini`**, ***save and close*** the file.

In the last two steps of preparing CPDLC AOC Client for use you have to enter the directory **`..\CPDLC_AOC_B16\DCDU`** and open the file **`DCDU1.ini`**. For the variable **`ServerIP=`** enter the IP-address of the computer that ***hosts/runs*** the CPDLC AOC ***Server***. Save and close the file.
Finally browse into **`..\CPDLC_AOC_B16\MCDU`**, open the file **`MCDU1.ini`** and do the same as for the DCDU: enter the server's IP-address at **`ServerIP=`** before saving and closing the file.

Optionally you can ***create a batch-file*** to automatically start those three programs in the correct sequence. If you would like to do so, follow these steps:

- start any text editor
- copy and paste the following text into it, replacing <<DRIVE>> and <<PATH>> with the location of the program on your own computer:

```
@echo off
start "CPDLC AOC Server"
"<<DRIVE>>:\<<PATH>>\CPDLC_AOC_B16\Server\CPDLC AOC Server.exe"
start "MCDU" <<DRIVE>>:\<<PATH>>\CPDLC_AOC_B16\MCDU\MCDU1.exe
start "DCDU" <<DRIVE>>:\<<PATH>>\CPDLC_AOC_B16\DCDU\DCDU1.exe
exit
```

- save the file as **`CPDLC AOC.bat`** and close it. Make sure that it is placed ***inside*** the directory of the ***Server***: **`..\CPDLC_AOC_B16\Server`**

From now on you simply select **`CPDLC AOC.bat`** to start the **CPDLC AOC Client**, all three programs – the CPDLC AOC Server, MCDU1 and DCDU1 – will open automatically.

3.3.4 Operation

With the programs running, check that the **CPDLC AOC Server** gives you at least two **green indicators**:

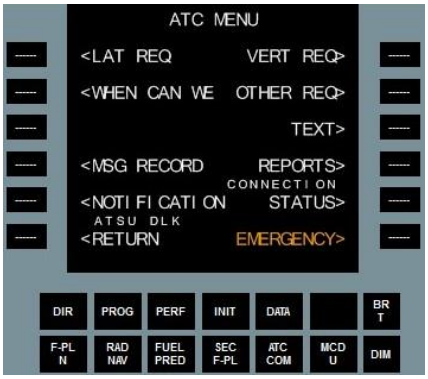
MCDU1:	Connected
DCDU1:	Connected

If so, you may ***minimize*** the CPDLC AOC Server application. You can find it in your ***system tray*** and it can be restored or closed from there.

3.3.4.1 Setting callsign and logging on to an ATC channel

Now let's check out the other two windows. We will start with ***MCDU 1***.

Select menu button ATC COM and on the following screen activate ATC MENU with the top left LSK.



We can now see all request options on this menu. You should explore and make yourself familiar with all the available request options on ATC MENU and try them out.

For normal operation we need to start at NOTIFICATION where we will set our Flight ID/callsign. It has to ***match your active VATSIM callsign***!

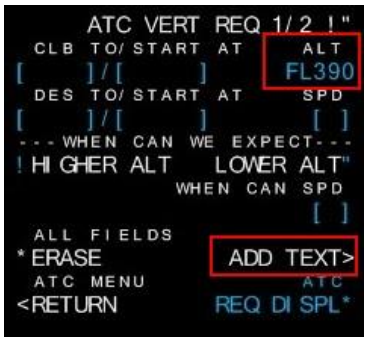
For example DLH1234.
Note: you can only change your ATC FLT NBR when you are not logged on to any ATC channel.

To ***logon*** to the channel of an ATCO offering CPDLC services, we have to insert its ***four letter CPDLC-identifier*** into the field ATC CENTER |||| and then click on the LSK next to NOTIFY.
Once the logon request has been received by ATC, its CPDLC-identifier appears in the list below ATC NOTIFIED: EDGG.
Should the requested ATC channel not be available you'll receive the following reply: NOTIF FAILED (notification failed)

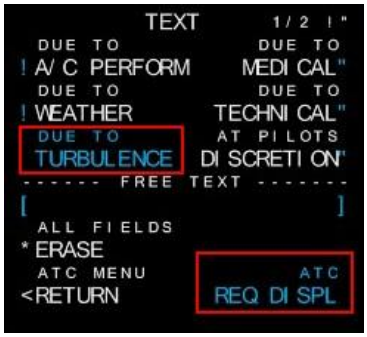
Once the notified ATC-station has accepted our logon-request, we will receive an announcement on ***DCDU 1***, stating ACTIVE ATC: EDGG CTL.

We can also verify the logon through our MCDU: on the pages ATC MENU and NOTIFICATION select the option CONNECTION STATUS. ACTIVE ATC will indicate the ATC-station that we are logged in with, in this case EDGG.
If you press the LSK next to DISCONNECT* you will logoff the channel.

3.3.4.2 ATC Request Options



For demonstration purposes let's **request FL390**. First select VERT REQ (vertical requests) and then enter the desired flightlevel into the field ALT [ ]. You can either request this level by clicking on the LSK next to ATC REQ DISPL* or you may add some explanatory text through ADD TEXT.



In this example we selected DUE TO TURBULENCE before pressing on the LSK at ATC REQ DISPL* (ATC request display).

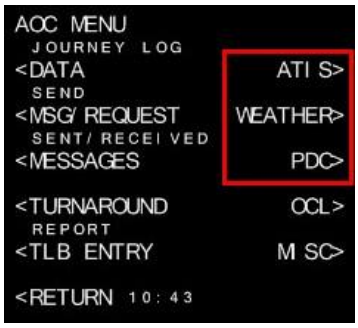
On our ***DCDU 1*** we can see the request being displayed. If we are happy with, we send it to ATC by clicking on the LSK next to SEND*. When doing this, the text will change from blue to green, indicating that it has been sent.

At some point ATC will process our request and instruct us to climb to the requested level. Please observe the ***requirement to confirm the message*** before initiating your level change. Click on the LSK next to WILCO and thereafter SEND* to acknowledge the receipt of the ATC instruction. Only then the loop will be closed for ATC.

3.3.4.3 PDC and ACARS

The CPDLC AOC Client offers you **ACARS** and **PDC (Pre-Departure Clearance)** functionalities.

Select menu button ATC COM and on the following screen activate AOC MENU with the LSK on its right side.



We can see a number of options on this AOC MENU. Basically you can ignore most of them except for ATIS, WEATHER and PDC.

Note: with this version on future version you do ***not*** have to be logged on to an ***active ATC channel*** anymore! With Beta 15 and higher, the CPDLC server ***will use the ICAO code of the airfield of departure as address to send the PDC request to***.

Select PDC to access the AOC DEPART REQUEST page.

If *clearance delivery* is available via ACARS at your airport of departure, you can use this function to request your clearance instead of calling ATC on voice. You first have to fill in a couple of fields to make it work.

For a fictional flight of DLH1234, an A320 from EDDF to EDDM, departing from gate A36, ATIS Delta received, we will request our PDC.

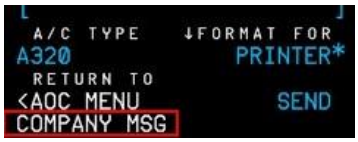
We type the ***ICAO-codes*** of our departure (origin) and destination into the MCDU scratchpad and insert it into the field below ORIG/DEST: EDDF/EDDM. Remember that the entry in the field of ORIG will be used as address to send the PDC request to. Should the controller of the departure airfield not use the airport code as address, it will not work and you'll have to revert to conventional communication methods.

FLT NO is our callsign, insert DLH1234.

Complete the information with GATE NUMBER and ATIS ID (a single letter is sufficient – in our example we just type "D").

Finally we enter our A/C TYPE as ***ICAO-code*** before we can press the LSK next to SEND*.

After a few seconds we should receive the notification COMPANY MSG on the scratchpad of our MCDU. In case that you do not get this notification, you need to add the relevant option in the file `server.ini` . ***CHAPTER 3.3.3*** will tell you how to set it up.



To access such messages, you need to return to the main AOC MENU and select the option SENT/RECEIVED MESSAGES.

On the following page you'll find the option RECEIVED MSG and by clicking the LSK next to it you will open a list of all received messages during the current session of the AOC Client.

The first message that we will receive is usually the confirmation that our message has been sent and received by ATC.

ATC will now work on our clearance and send it to us. Once we receive it we will see the notification COMPANY MSG once again.

The same as we did just a couple of moments ago, we access our received messages and read our Pre Departure Clearance

Should you be happy with it, click on the LSK next to ACCEPT*. A few seconds later it will transform to ACCEPT* in a much smaller font: your reply of acceptance has been sent.

To confirm it, yet another confirmation will be created and you will be notified of its receipt by the now well known COMPANY MSG.

To download and view a VATSIM ATIS, you need to select ATIS from AOC MENU.
You will now land on a page called ATIS REVIEW. This is the page that should be blank until you have successfully downloaded your first ATIS message of the current session.
To make such a download, simply press on the LSK next to REQ> and on the following ATIS RQ page enter an ICAO-code and press the LSK next to SEND*.

You will be taken back to AOC MENU automatically and you should notice a message saying VHF IN PROG that will disappear after a few seconds. As soon as it is gone the ATIS-request has finished being processed, access ATIS again to read the ATIS message.

Should no VATSIM ATIS be available for the airport that you requested it for, the page ATIS REVIEW will be blank.

Note: should the requested VATSIM ATIS not come through although you are sure that it is actually available, try again. Sometimes the ATIS is not synchronized on all servers of VATSIM and by trying one more time the CPDCL AOC Client will talk to another server that may contain the ATIS in its data stream.

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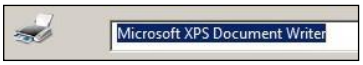
We will now have a brief look at the client's WEATHER menu, because there is a little catch to it.

Unlike ATIS reports, you are ***not*** able to display METAR and TAF results on your MCDU or DCDU, but CPDLC AOC Server will rather ***print them automatically*** on whatever device that is defined in **Server.ini** (located in **..\CPDLC_AOC_B16\Server**).

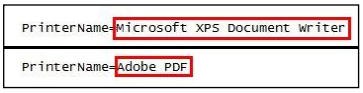
If you do not wish to have these weather reports printed on paper all the time, you can define a virtual printer that will create an XPS-file or a PDF on your computer.
By default Windows systems are equipped with the ***Microsoft XPS Document Writer***.

Make sure you are using ***the exact name*** of the ***printer device*** that you wish to use for these operations! To find your available printers, open ***Windows start menu*** and look for ***Devices and Printers***. In there you will find the Microsoft XPS Document Writer.
Best practice is to right click on its icon and select ***Printer properties***.

Copy its name and paste it into CPDLC AOC Server's **Server.ini** in the line **PrinterName=** and save the file.



You may enter any available printer device, for example **Adobe PDF** if you have Adobe Acrobat installed.



A ***network printer*** can be defined this way: **PrinterName=\\NAME_OF_COMPUTER\PRINTER_NAME**

If you now request weather reports through the MCDU the program will prompt you for a name at the end of process, before saving the file.

The resulting file holds your ACARS WEATHER printout.

```
ATSU D-AFOX 301115 12:56:12
COCKPIT PRINTER MESSAGE - LABEL C1
 SINGMXS 301256
AGM
AN D-AFOX/GL AOC2
- /
EDDF 301250Z 21018KT 5000 -RADZ FEW003 SCT007 BKN017 10/09 Q1019 NOSIG
LOWW 301250Z 28030G47KT 9999 FEW040 FEW045TCU SCT060 BKN210 13/05 Q1017 TEMPO
 FM1325 29040G55KT SHRA
LZIB 301230Z 31013KT 9999 -RA FEW016 BKN033 09/07 Q1018 NOSIG
```

There are more functions available and you should take your time to explore them, it won't take you more than a couple of minutes. If you would like to play with the MCDU functions before using it during an online flight, jump to ***CHAPTER 4*** of this manual and run ***Hoppie's ATC Client*** that is described there. You can take the roles of ATC and pilot at the same time and test the interaction of both programs.

4. SOFTWARE FOR AIR TRAFFIC CONTROLLERS

4.1 Definitions

4.1.1 Logon Code

An important topic is how you define your ***CPDLC Logon Code***.

The following basic rules shall apply worldwide:

- An ***ATC CPDLC Logon Code*** will always have a length of ***4 characters*** and may only contain letters from the Latin alphabet ***from A to Z***

  For example: EDDF, KLAX, EGLL, EDYY, LSAZ, EDGG, BIRD, EGTT, EKDK etc.…

- ***Make sure that nobody else is currently connected to the ACARS server with the same ATC ID!*** You can check all stations that are currently connected to Hoppie's ACARS server on **Message Log**.

- If you control a position that ***is specific to an airport***, such as ***Clearance Delivery (DEL), Apron or Ground (GND), Tower (TWR), Departure (DEP) or Approach/Arrival (APP)***, then ***use the ICAO code of that airport***.

  The reason is that ***in these positions you are going to issue PDCs only***.
  If, for instance, an ATC is using **`FTWR`** as code for EDDF_N_TWR, some pilots may have to use **`FTWR`** in their PDC-page as their airport of departure, because not all pilot CPDLC/PDC clients offer a separate address field and use the field of the airport of departure instead. As a consequence ***some pilots won't be able to enter it at all*** as it is not a valid airport code.

- If you control a position that ***is not specific to an airport***, such as ***Center/Enroute Radar (CTR)*** or a ***Flight Service Station (FSS)***, then ***you may use any meaningful code***.

  If there are several CTR-sectors with the same prefix but different suffixes, then make use of the suffix. For instance in Germany there are EDGG_E_CTR and EDGG_P_CTR. E_CTR will probably use **`EDGE`** and P_CTR will choose **`EDGP`**.
  If your ATC callsign contains only 2 or 3 characters, then you will need to come up with something meaningful.

4.1.2 Announcing your CPDLC Logon Code

Make sure that you let all other users know about your CPDLC capabilities and add a remark to your Controller Information, before logging in to VATSIM.

- Should you offer PDC only then annonce **`PDC address <logon code>`**
  e.g. **`PDC address EDDF`**.
- In case that you are offering CPDLC services, write **`CPDLC logon <logon code>`**
  e.g. **`CPDLC logon EDGG`**
- For CPDLC and PDC services, why not point it out: **`CPDLC PDC logon <logon code>`**.
  You will still use your area control code, for example **`EDGG`**, but it may be a good idea to list some of the fields that you control top-down and where you offer PDC: **`CPDLC PDC logon EDGG – EDDF EDDS EDFH EDSB`**.

4.2 Hoppie's ATC Client

Alongside the Airborne ACARS Client and its MCDU, Hoppie also created a custom made ***ATC Client***. It is a standalone program that is used by air traffic controllers to perform CPDLC communication with pilots who are logged in to Hoppie's ACARS server.

4.2.1 Download

On Hoppie's website you can **DOWNLOAD** **(2.2 Mb)** the program and find some more information about it.

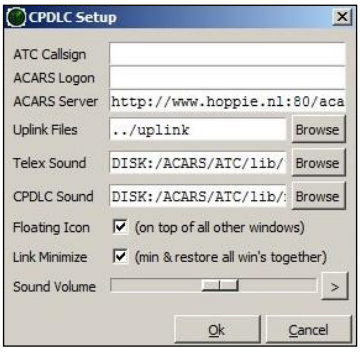
4.2.2 Installation

Run the downloaded file `acarsatc-1.5.1-install.exe` and install the program into a directory of your choice. In case that you have already created a folder called ACARS, why not install the program into it.

You should now ***update the CPDLC phraseology*** of the ATC Client. For details see the ***Appendix*** in ***CHAPTER 6.1*** of this manual, it's a quick fix.

4.2.3 Setup

Start the ***ATC Client*** and via `File` menu open `Setup`.



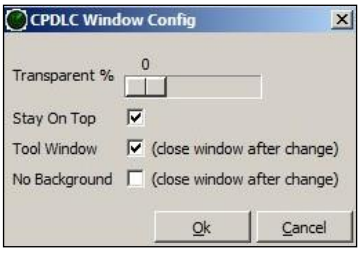
ATC Callsign: enter your ***4-letter ATC ID***. ***Make sure that nobody else is currently connected with the same ATC ID!*** You can check all stations connected to Hoppie's ACARS server on **Message Log**.

ACARAS Logon: here you have to enter your ***personal Hoppie ACARS logon code***. See ***CHAPTER 2*** to obtain it.

Floating Icon: I recommend activating it. You will see a small CPDLC icon on your screen. ***Double-clicking*** it will hide/show all active windows of the ATC Client, while the floating icon will always be available.

Link Minimize: it is self-explanatory, I suggest activating it, too.

You can now save your changes by clicking on Ok.



Right-click on the title bar of the ATC Client, select the last option called `Window Config`. If you are using one screen only and would like to keep the ATC Client on top of your radar screen (as long as the ATC Client is not minimized), check the option `Stay On Top`.

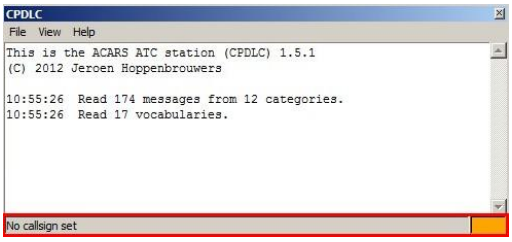
For the other setting options I suggest you consult **Hoppie's website**.

4.2.4 Operation

4.2.4.1 ATC Client

As soon as you have set an ATC callsign and a valid ACARS logon code the ***bottom right corner*** of the ATC Client is supposed to ***turn green***. You are now connected to Hoppie's ACARS server.

Should it remain grey or even turn amber or red then something is wrong and the program will tell you what the problem may be:



`No callsign set` amber

`illegal logon code` red

Note: You can ***force a manual server connection update*** by clicking on the ***status bar (bottom)*** of the ATC Client.

Through **`View`** menu you can control the following windows: **`Current Msgs`**, **`Planes Online`** and **`Telex`**. It is also possible to activate those windows by ***right clicking*** on the ***floating*** CPDLC ***icon***, this action will ***open a context menu***.

4.2.4.2 Current Messages Window

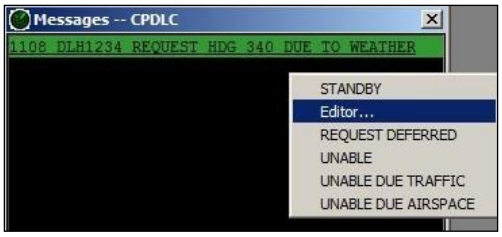
The window **`Current Messages`** shows you ***incoming (downlinked)*** and ***outgoing (uplinked)*** CPDLC messages.

The following colour codes apply:

GREEN	Downlinked message from a pilot that has not been processed by ATC yet
ORANGE	Message that fulfills the ***closed loop*** requirement, such as a pilot downlink request that has been answered by ATC or an uplinked instruction from an ATC to a pilot has been acknowledged by the pilot
BLUE	Uplinked message to a pilot, still pending for acknowledgement by pilot
WHITE	Downlinked acknowledgment from a pilot

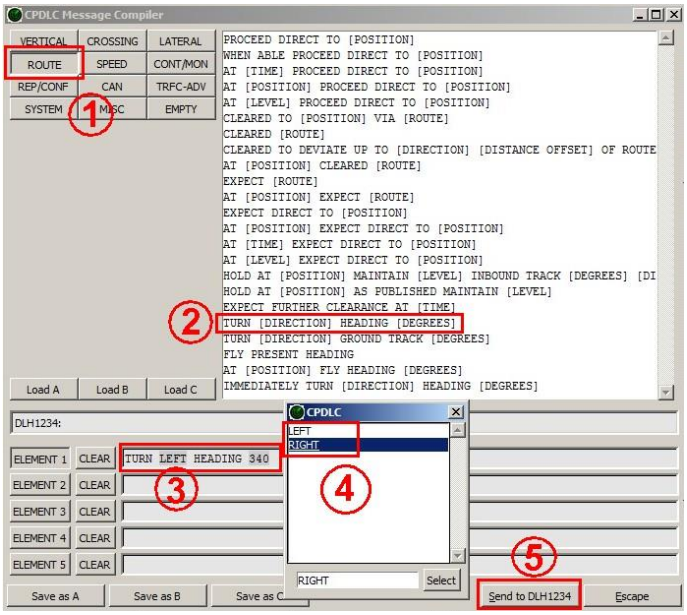
Let's take a look at a few examples:

DLH1234 requested to ***LOGON*** to our channel: DLH1234 REQUEST LOGON. By clicking on the window a context menu will open where we select ***ACCEPT LOGON***. As soon as this is done, the message will turn orange DLH1234 REQUEST LOGON, because we have closed the loop by accepting the request.



Now DLH1234 requests a heading to avoid weather:
DLH1234 REQUEST HDG 340 DUE TO WEATHER
Click onto the message to open the context menu and select **`Editor...`**

This selection will open the ***CPDLC Message Compiler***.



It holds an extensive set of ***pre-defined CPDLC-messages*** that are ***grouped in categories***. Its contents can be found in the file **`uplink.txt`**. As mentioned before, there is a ***more current version*** of this phraseology available in the ***Appendix*** of this manual.

A CPDLC message may consist of up to ***5 elements*** that need to be selected from the listed items. Some hold variables that are to be filled in.

To continue our sample-request from DLH1234, we will instruct the pilot to fly heading 340:

(1) select category **`ROUTE`**

(2) select item **`TURN [DIRECTION] HEADING [DEGREES]`**

(3) click on the first item that is shaded slightly darker

(4) change its value from **`LEFT`** to **`RIGHT`**

(5) when you are done, send it to the pilot. Check that the you are addressing the correct callsign

As soon as the message has been delivered to the ACARS server, you will see it appear in BLUE colour while the original request message by the pilot has changed to ORANGE.

As this instruction includes a change of heading, the ***closed loop requirement*** applies and we are expecting the pilot to send us an acknowledgment. This is shown as WILCO. Upon receiving the pilot's acknowledgment the status of our instruction changes from BLUE to ORANGE, the loop is closed.

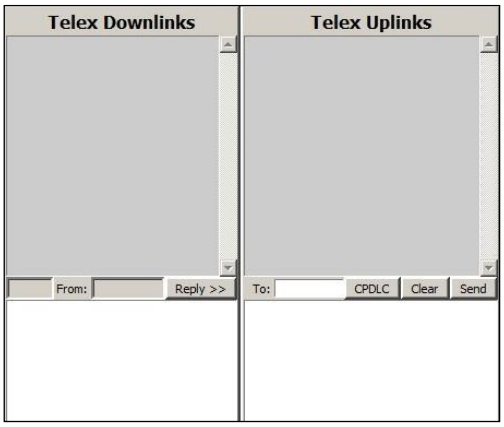
Messages that are not needed anymore can be closed and deleted by clicking on them, though certain restrictions exist:

- ORANGE messages will disappear when clicking on them.
- BLACK messages turn ORANGE when you click on them, so one more click will be required to hide them.
- GREEN and BLUE messages cannot be deleted by definition since they require interaction from us or from the pilot, respectively.

I invite you to explore all the different expressions that can be found in this set of phraseology. Some may seem to be a bit hidden, so get used to finding them.

4.2.4.3 TELEX window

Besides all those CPDLC-functions, you can also send and receive ***plain text*** messages through ***TELEX***. Pilots will receive, read, create and send messages of this category through their ***ACARS interfaces***.



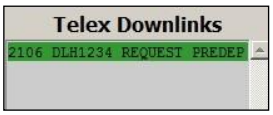
Received messages are listed in the column **`Telex Downlinks`** while sent messages are shown in the other column named **`Telex Uplinks`**.

New, unread downlinked Telex' are marked GREEN. When we click on one, its content will be displayed in the blank box below. A reply to such a message is initiated by clicking on the button **`Reply >>`**. This will cause the callsign to be transferred to the white address field **`To:`** . You may now either start typing a Telex message in the blank box below the address field, then send it by selecting the **`Send`** button, or you reply to a pilot's Telex by means of a CPDLC message: click on **`CPDLC`**. This action will open the ***CPDLC Message Compiler*** window where you can create a CPDLC message as described in the previous chapter.

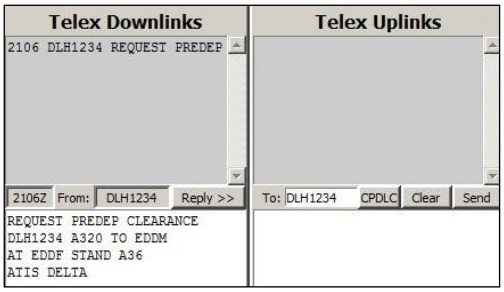
4.2.4.4 PDC – Pre Departure Clearance

The author of Hoppie's ATC Client decided to use the TELEX function for issuing PDCs. To make the message format look more like a DCL (CPDLC Departure Clearance) in the clients our pilots, ***a set of PDC-phraseology has been created*** and made its way into the updated set of phrases that you can obtain in ***CHAPTER 6.1*** (Appendix) of this manual.

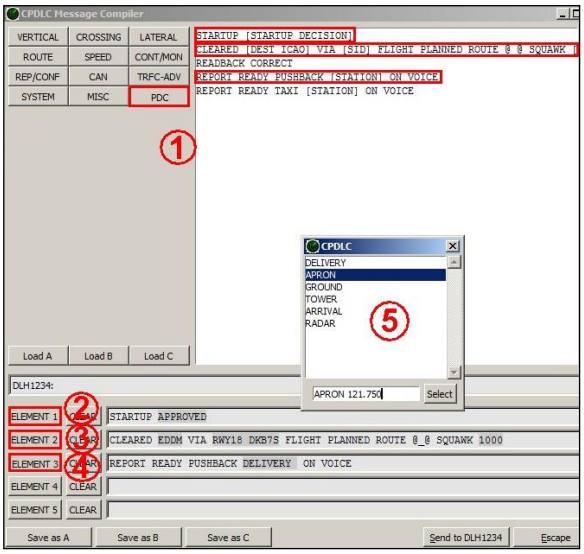
The message category **`EMPTY`** has been renamend **`PDC`** and here follows an example of how it will look like working with this function.



DLH1234 sends us a PDC-request for a flight from EDDF to EDDM. At our end the pilot's PDC-request will ***arrive as a Telex*** and we need to select it from the list of ***Downlinked Telex messages***.



Once we are ready to reply and issue the PDC, we initiate the process by clicking on the button **`Reply >>`** and then selecting **`CPDLC`** to open the ***CPDLC Message Compiler*** window.



(1) select category **PDC**

(2) select item **STARTUP [STARTUP DECISION].** Continue in the text line of **ELEMENT 1** where you may modify the variable **[STARTUP DECISION]**. If you click on the slightly darker shaded word you can choose between **APPROVED** and **NOT APPROVED**. Finish the action by clicking on **Select**.

(3) Before you can continue with the next element of the Pre Departure Clearance you need to select **ELEMENT 2** . Otherwise you will overwrite whatever you have entered in **ELEMENT 1** . Select again category **PDC** and item **CLEARED [DEST_ICAO] VIA [SID]...**
Here you will have to consequently click on all slightly darker shaded parts of the phrase and fill in the ***ICAO code*** of the destination, the ***assigned SID or departure procedure/instructions*** and finally the ***transponder code***.

(4) Technically the PDC is now complete. You may want to add optional information, e.g. whom to contact next. For this just create a new element, in this case **ELEMENT 3** , then select **PDC** where you look for the phrase **REPORT READY PUSHBACK [STATION] ON VOICE**.

(5) Down in the line of **ELEMENT 3** click on DELIVERY to open the list of pre-defined variables. In our example we choose **APRON** and we also add its frequency 121.750 manually.

Once done, we can send the message to DLH1234 and as confirmation for successful delivery to the ACARS server we can check for the BLUE coloured message in the **Current Messages** window.

After the pilot has read his PDC, he has to accept or reject it. If **ACCEPT** is selected by the pilot, the term WILCO is going to be downlinked and displayed in our client.

Once it is received by the ATCO's CPDLC Client it will cause the PDC-message to change from BLUE status to ORANGE, the loop is closed.

You may hide the message by clicking on it once.

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4.3 vSMR Plugin for EuroScope

vSMR is a plugin for EuroScope, a complex and popular air traffic control software. The author of vSMR is Pierre Ferran from VATFrance. For the time being its CPDLC-capabilities are relatively simple and until the next big update will be released, only PDC/DCL-functions are available. For ATCOs who prefer a plugin for EuroScope rather than a standalone program, it is recommended to start using vSMR. It will eventually offer full CPDLC functionality.

Note: there is one limitation: in the current version of vSMR (**`v1.2.0-beta.1`**) users of vSMR are not able to receive or accept logon requests from pilots. Pilots working with software that requires them to logon to the channel of an ATCO before requesting PDC (at this time CPDLC AOC Client), ***won't be able to communicate with you!*** Either fall back to voice communication or use Hoppie's ATC Client.

4.3.1 Download

Proceed to the **download section of vSMR** and get the latest version. At the time that this manual was written version **`1.2.0-beta1`** was current.

4.3.2 Installation

UnZIP the file **`vSMR_v1.2.0-beta.1-re.zip`** and place the 3 files

`vSMR.dll`	the plugin
`vSMR_Profiles.json`	settings file for the plugin
`ICAO_Airlines.txt`	database of airline codes and names

into any directory, but they all need to be in the ***same directory***. Normally this would be some sub directory of EuroScope's file path **`(<User Name>\Documents\EuroScope\Plugins)`**, a place where you collect all plugins.

4.3.3 Setup

There is an **official Wiki for this plugin**, consult it for more detailed setup instructions.

The CPDLC Quick Starter Manual will only touch the basics to get you started.

You now need to load the plugin within EuroScope.. To accomplish this start EuroScope and enter menu OTHER SET , select Plug-ins… Click on Load , browse the directories for your EuroScope plugin path and choose **`vSMR.dll`**. That's all, you can now close the plugin window.

You now have the ***option*** to continue using your regular EuroScope Radar Display or activate and use the ***special Ground Radar Display*** that came with the ***vSMR Plugin***. The PDC function of vSMR will work without activating and/or using the special Ground Radar Display of vSMR. Have a look at the screenshots on the vSMR's Wiki and take a decision. I suggest giving it a try. Should you ***decide against using it, jump to the paragraph*** where you are asked to type **`.smr`** to setup your CPDLC.

To activate vSMR's special Ground Radar Display it is possible to continue using your favourite ASR-file (EuroScope Radar Screen Setup) with an existing ground display. Find the file with your File Explorer, make a copy of it and then open the duplicated file with any text editor.

Look for the entry **`DisplayTypeName:Standard ES radar screen`** and change it to read **`DisplayTypeName:SMR radar display`**.

Then search for **`DisplayTypeNeedRadarContent:1`** and make the value 1 read 0: **`DisplayTypeNeedRadarContent:0`**.

```
DisplayTypeName:SMR radar display
DisplayTypeNeedRadarContent:0
```

Save the ASR-file, return to EuroScope and open the ASR-file through OPEN SCT.

You can now observe a grey bar at the top of your radar display, this is your ***vSMR menu***. Click on where it says **EGKK** and type the ICAO code of your airport.

Continue here whether you have activated the Special Ground Radar Display or not: In EuroScope's text line type **.smr** and hit Enter. This will open the CPDLC Settings dialogue where you have to enter your ***4-letter ATC ID*** as ***Logon Callsign***, for example **EDDF**.

Your Logon Password is your ***personal Hoppie ACARS logon code***. See ***CHAPTER 2*** to obtain it. ***Make sure that nobody else is currently connected with the same ATC ID!*** You can check all stations connected to Hoppie's ACARS server on **Message Log**.

Finish the setup by clicking on the OK-button.

Your next task is adding the ***vSMR Datalink Tag Item*** to your EuroScope Departure List. If the list is not displayed yet, open QUICK SET and select Show Departure List. Then on the left side of its title bar you click on S (**Departure List Columns Setup**).

Click on the button **Add Item** and open the drop-down list of **Tag Item Type**. Scroll to the very end of that list and choose **vSMR / Datalink clearance**.

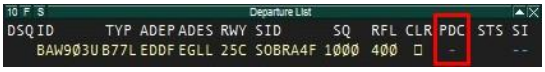
The Wiki of vSMR suggests using a Width of 1, but if you would like to have **PDC** as **Header name** in your Departure List a width of 4 has to be used. If you are happy to have only one letter as header, then use a width of 1 and whatever header you prefer, e.g. **P**.

As **Left button action** you should choose **vSMR / Datalink menu** and you are free to do whatever you prefer for the **Right button**: nothing at all or anything convenient to you. In this example it is being used to control the **clearance received flag**.

Now place the new item in the position you would like to have it among the others in the Departure List. Finish the process by clicking on OK.

Should the vSMR-item not be displayed in your Departure List, click on F and activate it.

Your Departure List will now feature the Datalink clearance item, in this system tagged as **PDC**.



Important: Save your Settings!

Please ***explore the functions of vSMR***. ***At least*** have a look at the plugin's **Wiki** about the following topics: **Approach window**, **RIMCAS** and **Tags and Symbology**. Almost every aspect of this plugin can be modified, check out the chapter **Editing the Plugin Settings (.json file)**.

4.3.4 Operation

When you login as ATCO, make sure that you ***announce the availability of PDC in your Controller INFO***. Otherwise most pilots will not know that you are offering PDC services!

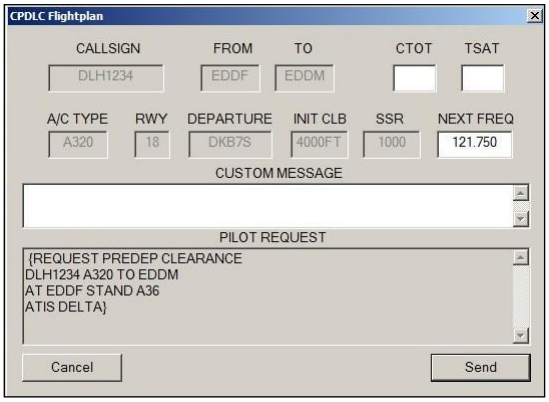
Once you are connected to VATSIM and have your vSMR Radar Display active, you need to ***logon to Hoppie's ACARS server***. Type `.smr connect` into the command line of EuroScope. A few moments later you will see a new chat window open, letting you know about your connection status. To disconnect just type `.smr connect` again.

If a pilot sends you a PDC request, you will receive an ***aural alert*** and the ***PDC Tag Item*** will now show a ***yellow letter*** R that is ***flashing***, signifying Request for clearance.

If you have not processed his flightplan, departure runway, SID/DP/departure instructions and transponder code yet, now is the time. Due to formatting of the PDC on cockpit devices, it is advisable to ***assign a temporary altitude for departing aircraft***, even if the SID contains a cleared initial altitude. This is a workaround for the message that will be sent to pilots and would otherwise mess up the display of the PDC on their cockpit devices. If local standard operating procedures dictate not to enter temporary altitudes in data tags, then delete it after issuing a PDC. To facilitate this, you could add the Tag Item Type `Temporary Altitude` to your Departure List, otherwise use EuroScope's function key F8 to assign/delete a temporary altitude.

vSMR automatically fetches the departure information set by ATC through the Departure List.

When you are done preparing the departure information for this pilot, ***click on the flashing*** letter R to open the Datalink menu. Select Confirm to ***accept the request for PDC***, this is going to open a new window, the ***CPDLC Flightplan***.



In the bottom part you can see the PDC request from the pilot. You can also see that most fields pre-filled and cannot be modified here. If you made a mistake, return to the Departure List and change details there and then check again whether they have been fetched correctly by the Plugin.
ATCOs can manually enter a **CTOT**, a **TSAT**, the next frequency to contact on voice (in this case 121.750 for startup and pushback) and you may add a custom message with additional information.

If everything is correct, click on `Send`, the PDC will now be transmitted to the pilot.

As a confirmation to you that the PDC has indeed been sent, the letter R changes to V until acknowledgement/acceptance by the pilot concerned is received by the vSMR plugin.

V will then turn green: V The communication loop is closed.

Note: should you hear ***vSMR's aural alert*** for a PDC request, but ***cannot*** observe any R flashing, then you might be in the situation that a pilot is using a ***callsign in his ACARS that is different from his current VATSIM callsign***. You may want to search the list for this pilot and ask him to change his ACARS callsign.

5. COLLECTION OF USEFUL WEBSITES

5.1 Information about ACARS, CPDLC & Co.

General information about ACARS
https://en.wikipedia.org/wiki/Aircraft_Communications_Addressing_and_Reporting_System

General information about CPDLC
https://en.wikipedia.org/wiki/Controller%E2%80%93pilot_data_link_communications

CPDLC crash course
http://members.optusnet.com.au/~cjr/CPDLC.htm

Beginners Guide to PDC
http://community.vatsim-uk.co.uk/topic/31560-pdc-pictoral-beginners-guide/

PDC Demonstration Video (YouTube)
https://www.youtube.com/watch?v=JMAFFmoD6f0&app=desktop

DCL CPDLC Departure Clearance Guide
https://www.nbaa.org/ops/cns/datalink/DCIT-TDLS-Flight-Deck-User-Guide.pdf

Global Operational Datalink Manual (GOLD)
http://www.ispacg-cra.com/GOLD_26_04_13.pdf

5.2 Software for pilots and air traffic controllers

Hoppie's ACARS main website
http://www.hoppie.nl/acars/

Register for your personal ACARS LOGON CODE
http://www.hoppie.nl/acars/system/register.html

Hoppie's ACARS Airborne Client for pilots
http://www.hoppie.nl/acars/prg/air/

Project A330 CPDLC AOC Client
http://www.dalpi.de/joomla/index.php?option=com_content&view=article&id=61&Itemid=82

Hoppie's ACARS ATC Client for air traffic controllers
http://www.hoppie.nl/acars/prg/atc/

vSMR PDC CPDLC Plugin for EuroScope DOWNLOAD
https://github.com/pierr3/vSMR/releases

vSMR PDC CPDLC Plugin for EuroScope WIKI
https://github.com/pierr3/vSMR/wiki

6. APPENDIX

6.1 Updated phraseology for ACARS ATC Client

To ***bring your CPDLC-phraseology up to current standards and VATSIM needs***, save **THIS LINK** (**`uplink.txt`**) and place it into the subfolder **`\etc`** of your Hoppie ACARS ATC Client. Before you do this, make a backup copy of the original file **`uplink.txt`** that is already in place.

For your reference the updated CPDLC-phraseology can be reviewed here below:

```
[VERTICAL]
EXPECT [LEVEL]:R
EXPECT CLIMB AT [TIME]:R
EXPECT CLIMB AT [POSITION]:R
EXPECT DESCENT AT [TIME]:R
EXPECT DESCENT AT [POSITION]:R
EXPECT CRUISE CLIMB AT [TIME]:R
EXPECT CRUISE CLIMB AT [POSITION]:R
AT [TIME] EXPECT CLIMB TO [LEVEL]:R
AT [POSITION] EXPECT CLIMB TO [LEVEL]:R
AT [TIME] EXPECT DESCENT TO [LEVEL]:R
AT [POSITION] EXPECT DESCENT TO [LEVEL]:R
AT [TIME] EXPECT CRUISE CLIMB TO [LEVEL]:R
AT [POSITION] EXPECT CRUISE CLIMB TO [LEVEL]:R
MAINTAIN [LEVEL]:WU
CLIMB TO AND MAINTAIN [LEVEL]:WU
AT [TIME] CLIMB TO AND MAINTAIN [LEVEL]:WU
AT [POSITION] CLIMB TO AND MAINTAIN [LEVEL]:WU
DESCEND TO AND MAINTAIN [LEVEL]:WU
AT [TIME] DESCEND TO AND MAINTAIN [LEVEL]:WU
AT [POSITION] DESCEND TO AND MAINTAIN [LEVEL]:WU
CLIMB TO REACH [LEVEL] BY [TIME]:WU
CLIMB TO REACH [LEVEL] BY [POSITION]:WU
DESCEND TO REACH [LEVEL] BY [TIME]:WU
DESCEND TO REACH [LEVEL] BY [POSITION]:WU
MAINTAIN BLOCK [LEVEL] TO [LEVEL]:WU
CLIMB TO AND MAINTAIN BLOCK [LEVEL] TO [LEVEL]:WU
DESCEND TO AND MAINTAIN BLOCK [LEVEL] TO [LEVEL]:WU
CRUISE CLIMB TO [LEVEL]:WU
CRUISE CLIMB ABOVE [LEVEL]:WU
EXPEDITE CLIMB TO [LEVEL]:WU
EXPEDITE DESCENT TO [LEVEL]:WU
IMMEDIATELY CLIMB TO [LEVEL]:WU
IMMEDIATELY DESCEND TO [LEVEL]:WU
IMMEDIATELY STOP CLIMB AT [LEVEL]:WU
IMMEDIATELY STOP DESCENT AT [LEVEL]:WU
CLIMB AT [VERTICAL RATE] MINIMUM:WU
CLIMB AT [VERTICAL RATE] MAXIMUM:WU
DESCEND AT [VERTICAL RATE] MINIMUM:WU
DESCEND AT [VERTICAL RATE] MAXIMUM:WU

[CROSSING]
EXPECT TO CROSS [POSITION] AT [LEVEL]:R
EXPECT TO CROSS [POSITION] AT OR ABOVE [LEVEL]:R
EXPECT TO CROSS [POSITION] AT OR BELOW [LEVEL]:R
EXPECT TO CROSS [POSITION] AT AND MAINTAIN [LEVEL]:R
CROSS [POSITION] AT [LEVEL]:WU
CROSS [POSITION] AT OR ABOVE [LEVEL]:WU
CROSS [POSITION] AT OR BELOW [LEVEL]:WU
CROSS [POSITION] AT AND MAINTAIN [LEVEL]:WU
CROSS [POSITION] BETWEEN [LEVEL] AND [LEVEL]:WU
CROSS [POSITION] AT [TIME]:WU
CROSS [POSITION] AT OR BEFORE [TIME]:WU
CROSS [POSITION] AT OR AFTER [TIME]:WU
CROSS [POSITION] BETWEEN [TIME] AND [TIME]:WU
CROSS [POSITION] AT [SPEED]:WU
CROSS [POSITION] AT OR LESS THAN [SPEED]:WU
CROSS [POSITION] AT OR GREATER THAN [SPEED]:WU
CROSS [POSITION] AT [TIME] AT [LEVEL]:WU
CROSS [POSITION] AT OR BEFORE [TIME] AT [LEVEL]:WU
CROSS [POSITION] AT OR AFTER [TIME] AT [LEVEL]:WU
CROSS [POSITION] AT AND MAINTAIN [LEVEL] AT [SPEED]:WU
AT [TIME] CROSS [POSITION] AT AND MAINTAIN [LEVEL]:WU
AT [TIME] CROSS [POSITION] AT AND MAINTAIN [LEVEL] AT [SPEED]:WU

[LATERAL]
OFFSET [DIRECTION] [DISTANCE OFFSET] OF ROUTE:WU
AT [POSITION] OFFSET [DIRECTION] [DISTANCE OFFSET] OF ROUTE:WU
AT [TIME] OFFSET [DIRECTION] [DISTANCE OFFSET] OF ROUTE:WU
PROCEED BACK ON ROUTE:WU
REJOIN ROUTE BY [POSITION]:WU
```

```
REJOIN ROUTE BY [TIME]:WU
EXPECT BACK ON ROUTE BY [POSITION]:R
EXPECT BACK ON ROUTE BY [TIME]:R
RESUME OWN NAVIGATION:WU

[ROUTE]
PROCEED DIRECT TO [POSITION]:WU
WHEN ABLE PROCEED DIRECT TO [POSITION]:WU
AT [TIME] PROCEED DIRECT TO [POSITION]:WU
AT [POSITION] PROCEED DIRECT TO [POSITION]:WU
AT [LEVEL] PROCEED DIRECT TO [POSITION]:WU
CLEARED TO [POSITION] VIA [ROUTE]:WU
CLEARED [ROUTE]:WU
CLEARED TO DEVIATE UP TO [DIRECTION] [DISTANCE OFFSET] OF ROUTE:WU
AT [POSITION] CLEARED [ROUTE]:WU
EXPECT [ROUTE]:R
AT [POSITION] EXPECT [ROUTE]:R
EXPECT DIRECT TO [POSITION]:R
AT [POSITION] EXPECT DIRECT TO [POSITION]:R
AT [TIME] EXPECT DIRECT TO [POSITION]:R
AT [LEVEL] EXPECT DIRECT TO [POSITION]:R
HOLD AT [POSITION] MAINTAIN [LEVEL] INBOUND TRACK [DEGREES] [DIRECTION] TURN LEG TIME [LEG TYPE]:WU
HOLD AT [POSITION] AS PUBLISHED MAINTAIN [LEVEL]:WU
EXPECT FURTHER CLEARANCE AT [TIME]:R
TURN [DIRECTION] HEADING [DEGREES]:WU
TURN [DIRECTION] GROUND TRACK [DEGREES]:WU
FLY PRESENT HEADING:WU
AT [POSITION] FLY HEADING [DEGREES]:WU
IMMEDIATELY TURN [DIRECTION] HEADING [DEGREES]:WU

[SPEED]
AT [TIME] EXPECT [SPEED]:R
AT [POSITION] EXPECT [SPEED]:R
AT [LEVEL] EXPECT [SPEED]:R
AT [TIME] EXPECT [SPEED] TO [SPEED]:R
AT [POSITION] EXPECT [SPEED] TO [SPEED]:R
AT [LEVEL] EXPECT [SPEED] TO [SPEED]:R
MAINTAIN [SPEED]:WU
MAINTAIN PRESENT SPEED:WU
MAINTAIN [SPEED] OR GREATER:WU
MAINTAIN [SPEED] OR LESS:WU
MAINTAIN [SPEED] TO [SPEED]:WU
INCREASE SPEED TO [SPEED]:WU
INCREASE SPD TO [SPEED]:WU
INCREASE SPEED TO [SPEED] OR GREATER:WU
REDUCE SPEED TO [SPEED]:WU
REDUCE SPEED TO [SPEED] OR LESS:WU
DO NOT EXCEED [SPEED]:WU
RESUME NORMAL SPEED:WU

[CONT/MON]
CONTACT [UNIT NAME] [FREQUENCY]:WU
AT [POSITION] CONTACT [UNIT NAME] [FREQUENCY]:WU
AT [TIME] CONTACT [UNIT NAME] [FREQUENCY]:WU
MONITOR [UNIT NAME] [FREQUENCY]:WU
AT [POSITION] MONITOR [UNIT NAME] [FREQUENCY]:WU
AT [TIME] MONITOR [UNIT NAME] [FREQUENCY]:WU
SQUAWK [CODE]:WU
STOP SQUAWK:WU
SQUAWK ALTITUDE:WU
STOP ALTITUDE SQUAWK:WU
SQUAWK IDENT:WU

[REP/CONF]
REPORT BACK ON ROUTE:R
REPORT LEAVING [LEVEL]:R
REPORT LEVEL [LEVEL]:R
REPORT REACHING [LEVEL]:R
REPORT REACHING BLOCK [LEVEL] TO [LEVEL]:R
REPORT PASSING [POSITION]:R
REPORT DISTANCE [TO/FROM] [POSITION]:NE
REPORT REMAINING FUEL AND SOULS ON BOARD:NE
CONFIRM POSITION:NE
CONFIRM ALTITUDE:NE
CONFIRM SPEED:NE
CONFIRM ASSIGNED ALTITUDE:NE
CONFIRM ASSIGNED SPEED:NE
CONFIRM ASSIGNED ROUTE:NE
CONFIRM TIME OVER REPORTED WAYPOINT:NE
CONFIRM REPORTED WAYPOINT:NE
CONFIRM NEXT WAYPOINT:NE
CONFIRM NEXT WAYPOINT ETA:NE
CONFIRM ENSUING WAYPOINT:NE
CONFIRM REQUEST:NE
CONFIRM SQUAWK:NE
CONFIRM HEADING:NE
CONFIRM GROUND TRACK:NE
CONFIRM ATIS CODE:NE
REQUEST POSITION REPORT:NE
```

```
[CAN]
WHEN CAN YOU ACCEPT [LEVEL]:NE
CAN YOU ACCEPT [LEVEL] AT [POSITION]:AN
CAN YOU ACCEPT [LEVEL] AT [TIME]:AN
WHEN CAN YOU ACCEPT [SPEED]:NE
WHEN CAN YOU ACCEPT [DIRECTION] [DISTANCE OFFSET] OFFSET:NE

[TRFC-ADV]
ALTIMETER [ALTIMETER]:R
RADAR SERVICES TERMINATED:R
RADAR CONTACT [POSITION]:R
RADAR CONTACT LOST:R
CHECK STUCK MICROPHONE [FREQUENCY]:R
ATIS [CODE]:R

[SYSTEM]
ERROR [CODE]:NE
NEXT DATA AUTHORITY [UNIT ICAO]:NE
END SERVICE:NE
SERVICE TERMINATED:NE
SERVICE UNAVAILABLE:NE
VOICE READ BACK REQUIRED:NE
CURRENT ATC UNIT [UNIT ICAO] [UNIT NAME]:NE
THIS IS AN AUTOMATED MESSAGE TO CONFIRM CPDLC CONTACT WITH [UNIT NAME]:R
SET MAX UPLINK DELAY VALUE TO [UPLINKDELAY] SEC:R

[MISC]
WHEN READY:NE
THEN:NE
DUE TO TRAFFIC:NE
DUE TO AIRSPACE RESTRICTION:NE
DISREGARD:R
MAINTAIN OWN SEPARATION AND VMC:WU
AT PILOTS DISCRETION:NE

[PDC]
STARTUP [STARTUP_DECISION]:WU
CLEARED [DEST_ICAO] VIA [SID] FLIGHT PLANNED ROUTE @_@ SQUAWK [CODE]:WU
READBACK CORRECT:R
REPORT READY PUSHBACK [STATION] ON VOICE:R
REPORT READY TAXI [STATION] ON VOICE:R

[VOCABULARIES]
LEVEL:FL240:FL250:FL260:FL270:FL280:FL290:FL300:FL310:FL320:FL330:FL340:FL350:FL360:FL370:FL380:FL390:FL400
:FL410
TIME:TEXT
POSITION:TEXT
ROUTE:TEXT
CODE:TEXT
SPEED:300K:320K:350K:M75:M78:M80:M82:M84:M86:M88
UNIT NAME:RADAR:CONTROL:MAASTRICHT CENTER:SHANWICK CENTER:GANDER OCEANIC
UNIT ICAO:EDYY:EGGX:CZQX
FREQUENCY:TEXT
DIRECTION:LEFT:RIGHT
DEGREES:010:020:030:040:050:060:070:080:090:100:110:120:130:140:150:160:170:180:190:200:210:220:230:240:250
:260:270:280:290:300:310:320:330:340:350:360
ALTIMETER:TEXT
LEG TYPE:TEXT
DISTANCE OFFSET:5NM:10NM:15NM:20NM
TO/FROM:TO:FROM
UPLINKDELAY:30:60:90:120
VERTICAL RATE:4000FTMIN:3000FTMIN:2000FTMIN:1000FTMIN:0FTMIN:-1000FTMIN:-2000FTMIN:-3000FTMIN:-4000FTMIN
DEST_ICAO:TEXT
SID:TEXT
STARTUP_DECISION:APPROVED:NOT APPROVED
STATION:DELIVERY :APRON :GROUND :TOWER :ARRIVAL :RADAR
```

6.2 FAQ – Frequently Asked Questions

6.2.1 Hoppie CPDLC Airborne Client

Question: The ***MCDU does not offer*** any ***VATSIM ATIS***! It keeps telling me that this function has not been implemented yet! What's going on?

Answer: After starting the Airborne Client, 747 Broker and MCDU, confirm on the ***Airborne Client*** that ***version 1.9*** is installed and running. Other users had either ***forgotten*** to install the updated version of MCDU and Airborne Client or they installed the updates into a ***wrong directory***.
When installing the updated Airborne Client, make sure you select the **`prg`**-directory of ACARS-MSFS and ***not*** the main directory! Select **`..\ACARS-MSFS\prg\`** as target or it will not work. Make sure that the installation routine asks you to overwrite existing data. If it does not ask you for that, something went wrong in the selection of the target directory.

6.2.2 vSMR CPDLC Plugin

Question: I keep on receiving pilot ***requests to logon*** to my CPDLC/PDC-channel. I have told those pilots that my software cannot process logon requests and that they should send me their PDC request only. Still they are ***not able to receive the PDC messages*** that I have sent them!

Answer: This is a known problem. Should this occur then ***those pilots need to restart their CPDLC clients*** and request their PDC again ***without*** attempting to logon to your CPDLC/PDC-channel. Otherwise CPDLC pilot clients get confused and keep on waiting for a reply to their request to logon and ignore any other CPDLC messages until their request to logon gets either rejected or accepted. Only a restart of the CPDLC pilot client will clear this issue.

6.2.3 Hoppie CPDLC ATC Client

Question: As ATCO I prefer not using CPDLC, because with the CPDLC ATC Client ***I am afraid to miss incoming messages***. Having to keep an eye on the standalone application ***will distract me*** too much from my duties as ATCO, so I rather wait for a future Plugin to EuroScope.

Answer: Don't worry. You will ***NOT*** need to constantly/regularly monitor the Hoppie CPDLC ATC Client for incoming messages (Telex or CPDLC)!
Once the Client receives a new incoming message, ***it will automatically notify you with an aural alert*** and at the same time the respective ***window with the message*** (Telex or CPDLC) itself ***will pop up***. You can always ***minimize Hoppie's CPDLC ATC Client*** and ***disregard it*** until you receive a message.

6.2.4 Project A330 CPDLC AOC Client

Question: I am having trouble with PDCs. I am ***unable to send PDC*** requests ***without logging on*** to an ATCO's channel. With some ATCOs it works, with others it just does not work.

Answer: You may be using an ***outdated version*** of the Project A330 CPDLC AOC Client. If your ***air traffic controller is using*** the ***vSMR***-plugin for EuroScope, he will ***NOT*** be able to ***process logon-requests*** and to solve this problem a ***new version*** of the Project A330 CPDLC AOC Client has been made available. It won't require pilots to logon to ATC channels before sending PDC requests.

Download the new version of the Project A330 CPDLC AOC Client here: **LINK**

6.3 List of revisions of this document

Record of changes

Edition 1.0	04 DEC 2015	First issue of CPDLC Quick Starter Manual
Edition 1.1	13 DEC 2015	⇒ Formatting, typing errors, missing words corrected ⇒ **Chapter 1:** note about CPDLC, PDC and DCL edited and new paragraph about differences between CPDLC and ACARS/PDC added ⇒ **Chapter 3:** new subchapter 3.1 “Definitions” added, following subchapters renumbered ⇒ **Chapter 3.2.3:** added a note regarding restarting MCDU ⇒ **Chapter 3.2.4.1:** clarficiation to NOT logon to an ATCO before requesting PDC as it may cause problems, depending on the software used by ATC ⇒ **Chapter 3.2.4.3:** re-iterated the fact that pilots do not need to logon to ATC before requesting PDC. Link to a YouTube PDC-demonstration video added. Explanation added on how to delete historic ACARS messages ⇒ **Chapter 4:** new subchapter 4.1.2 “Announcing your CPDLC Logon Code” added ⇒ **Chapter 4.3.3:** added option to use or not use vSMR’s Special Ground Radar Display ⇒ **Chapter 4.3.4:** emphasized importance of announcing availability of PDC services. Added instructions to use temporary altitudes due to formatting issues in cockpit devices ⇒ **Chapter 5:** 2 new links added ⇒ **Chapter 6.1:** to avoid formatting errors, `uplink.txt` was made available as direct download
Edition 1.2	25 FEB 2016	⇒ **Chapter 1:** Note about CPDLC/PDC slightly rephrased ⇒ **Chapter 3.3:** New version of A330 CPDLC AOC Client featured and explained ⇒ **Chapter 6.2:** FAQ updated and inserted ⇒ **Chapter 6.3:** chapter containing record of changes renumbered to 6.3
Edition 1.2.1	26 FEB 2016	⇒ **Chapter 3.3.4.3:** Explanation of PDC procedure had not been updated entirely, done now.
Edition 1.2.2	**25 NOV 2016**	⇒ **Chapter 3.2.3:** Leave “wfacars” active for Hoppie’s ACARS ATC Client ⇒ **Chapter 3.2.4.3:** Proper method to erase historic ACARS messages ⇒ **Chapter 3.3:** Beta 16 of Project A330 CPDLC AOC Client released. References change from B15 to B16. If you have B15 installed, you don’t need to do anything.

END OF DOCUMENT

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