

# Quick installation guide

## DAR

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Content: Digital ADSL Regenerator  
Quick installation guide

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v1.0	28-03-2012	System configuration at NMS

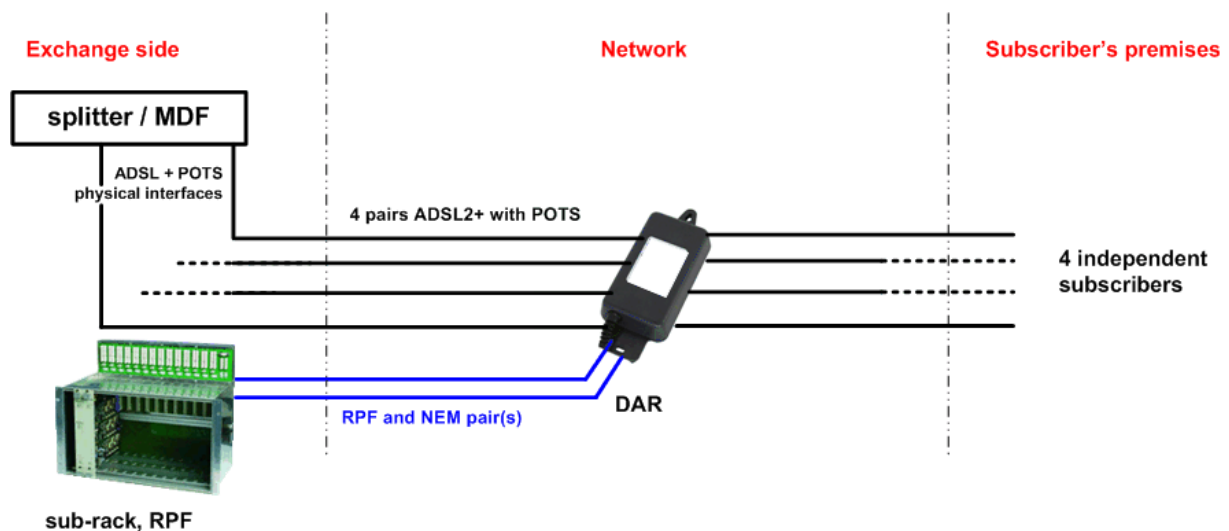
# 1 System overview

The DAR is a digital ADSL signal amplifier that provides transparent transmission between the exchange location and distant subscriber. The system can extend the signaling distance (or the bandwidth) of up to 4 individual subscribers over their existing copper pairs using the latest coding / decoding and remote power feeding solutions.

The target application of the system is to provide ADSL service for those subscribers who are:

- living too far from the exchange to get reasonable ADSL speeds – RURAL APPLICATION,
- cannot get high speed broadband for Triple Play service – IPTV APPLICATION.

The basic configuration of the system is shown below:



The system contains 2 main units:

- **RPF** – Remote Power Feeding unit, located at the Exchange which can provide the power for 4 Regenerators,
- **DAR** – Digital ADSL Regenerator, located somewhere in the middle of the link which digitally regenerates the signal for up to 4 customers.

The RPF is a rack-type version where the SBR sub-rack provides the connection facilities and the 48/60 Vdc local power to the unit. It has 4 separate power interface towards the remote areas which can feed 4 different DAR units.

The DAR is housed in a heavy protected outdoor box and regenerates the ADSL signal for 4 different customers.

## 2 System configuration

After the physical installation it is possible to modify the basic parameters of the system, to change the factory default values according to the local requirements.

The user has to connect its laptop to the installed NEM card and should run the Management Monitor program. After the first steps – written in the NMS document – the GUI of DAR can be seen on the screen.

The modification process:

1. Enable **Config ON/OFF** button at SYSTEM tab.
2. Do the necessary adjustment(s).
3. Press **Store** button at SYSTEM tab after each modifications.
4. Disable **Config ON/OFF** button.

### 2.1 RPF configuration

BEFORE STARTING ANY CONFIGURATION IT IS RECOMMENDED TO SET BACK ALL FACTORY DEFAULT BY “**Restore RPF factory defaults**” BUTTON AT RPF TAB.

The RPF card provides the necessary power to the DAR unit. If the standardized maximum level (320 Vdc) can be applied on the network one twisted pair is enough to power the DAR. In case of reduced voltage level limitation two twisted pairs are necessary.

At RPF tab the output voltage level and the current limit can be seen.

Line	#1	#2	#3	#4
Power output :	Enabled	Enabled	Enabled	Enabled
Wakeup control :	Disabled	Disabled	Disabled	Disabled

The voltage level can go up to 320 Vdc while the current limit can be set to 60 or 100 mA. All the power outputs must be in **Enabled** position. The wakeup control depends on local requirements, it is recommended to be **Enabled**, too.

## 2.2 ADSL configuration

BEFORE STARTING ANY CONFIGURATION IT IS RECOMMENDED TO SET BACK ALL FACTORY DEFAULT BY “*Restore ALL factory defaults*” BUTTON AT DAR-SYSTEM TAB.

The ADSL channels can be configured at: ADSL and PERF ADSL tabs.

### 2.2.1 Basic parameters

The global ADSL environment can be set at ADSL tab. E-side is the first section: DSLAM-DAR, R-side is the second section: DAR-CPE.

Global settings

E-side mode : Annex A

R-side mode : Annex A

R-side PSD mask mode : Normal

R-side CAL mode/value : HW defined 26

The user can set here the Annex A or B mode or optional Annex M, J, I. The factory default is Annex A. After selection, the **Store** button should be used at SYSTEM tab.

The adjustable PSD masks are factory options. Selecting NORMAL mode the system doesn't use any frequency spectrum mask. Additionally, there are 2 built-in options: BT ANFP mode (UK standard) and FT ANFP mode (French standard). Further options are possible according to variable national requirements. After selection, the **Store** button should be used at SYSTEM tab.

The PSD mask is defined by the CAL value of the DAR location. It is possible to set it by hardware (HW defined) or manually by NMS (NMS configure).

The HW defined CAL can be set by the combination of 4 wires of DAR (see DAR manual).

The NMS configure settings require the knowledge of electrical length of the ADSL cable between Exchange and DAR. To get this information there are several ways:

- The user aware of the physical length of the cable and the electrical length can be calculated. Theoretically, 1 km PE0.4 cable has around 14 dB attenuation. The total attenuation can be used as CAL.
- The user is able to measure the line with line tester displaying the attenuation of the section. This value can be used as CAL.
- The system automatically measures the attenuation. The LATN (line attenuation) value shows the attenuation of the cable. This measured value can be used as CAL.

E-side ADSL interface															
Ch	State	Speed	Latency	SNR	LATN	CRC	FEC	D.Rate	ATM cells	ATTNDR	ACTATP	SATN	INP	FMAX	
#1	IDLE	ds	13992	8	20	3	186	347	0	28	24396	6	3	1.1	2208.0000
		us	508	13	23	0	0	0	0	0	588	0	0	1.7	

After the roll window the user can type the required CAL value. Writing the number Enter must be pressed then **Store** button at SYSTEM tab.

Lower, it is possible to set the operating mode of ADSL channels.

Operating modes of channels

Operating modes : #1 TEST #2 TEST #3 TEST #4 TEST

Restart all channels

The system can handle the channels in test mode where the profiles of the 2 sections are not strictly the same. This mode is recommended during tests because the synchronization processes are much faster however it **MUST BE** checked whether the DAR doesn't introduce any bottleneck to any data direction.

Example: E-side ds: 13992 Kbps – R-side ds cannot be less than E-side ds  
R-side us: 508 Kbps – E-side us cannot be less than R-side us.

Using NORMAL mode the system harmonize the profiles at E and R sides. Please note that it may take longer time.

**IMPORTANT:** The user can check the fmax which is the upper limit of the used frequency range at E-side. The system will use the band at R-side over this value.

## 2.2.2 Profiles

The ADSL performance can be limited and regulated by using pre-defined ADSL profiles. This profile can be set channel by channel separately for E and R sides at the PERF ADSL tab.

**NOTE:** The profile and related parameters are defined at DSLAM management, DAR can do only limitations!

DAR contains factory default profiles for both links: Default #0.

E-side profile settings

Select profile number : 0

Profile name : Default #0

Modes :  T1.413  ADSL  ADSL2  ADSL+  AnnL

Rate range, ds/us [kbps] : min 128 max 14000 min 32 max 512

Max. delay, ds/us [ms] : 63 63

Favor INP over data rate : OFF

ADSL Restart setup : SES count limit 14 Error check interval [s] 15 Restart Delay [min] 10

Copy settings from profile :

Validate profile

The user can create its own profile by

1. giving new profile number (1, 2, 3, ...) and press Enter,
2. add 0 to "Copy settings from profile" – this way all the parameters will be copied from default and only the necessary could be changed,
3. give new profile name (any text),
4. do the necessary modifications in profile (the most common are the speed ranges, delays or INP),
5. press "**Validate profile**" button.

In order to take new profile into effect the user should go back to ADSL tab where the required profiles can be selected.

E-side			R-side		
Ch	Profile number	Profile name	Ch	Profile number	Profile name
#1	<input type="text" value="0"/>	<input type="text" value="Default #0"/>	#1	<input type="text" value="0"/>	<input type="text" value="Default #0"/>
#2	<input type="text" value="0"/>	<input type="text" value="Default #0"/>	#2	<input type="text" value="0"/>	<input type="text" value="Default #0"/>
#3	<input type="text" value="0"/>	<input type="text" value="Default #0"/>	#3	<input type="text" value="0"/>	<input type="text" value="Default #0"/>
#4	<input type="text" value="0"/>	<input type="text" value="Default #0"/>	#4	<input type="text" value="0"/>	<input type="text" value="Default #0"/>

Here typing the new profile number (then pressing Enter) at the selected channel and section will follow the definitions of the new profile. The ADSL channel must be restarted after setting new profile.