



FREQUENCY SHIFTING REPEATERS

Axell Wireless Frequency Translating repeater provides as much coverage as a macro base station does and this to a fraction of the cost! In addition, Axell Wireless cell-enhancers are truly EDGE compatible with a very low EVM value. This combination of both superior linearity and high output power ensures elevated data throughput and great signal quality. Due to the increased isolation requirement in EDGE environments, the Frequency Translating technology plays an even larger role as a cost-effective alternative to both base stations and conventional repeaters.

Operators with licenses within two bands have through the Axell Wireless Band Shifting Repeaters the possibility to use link frequencies on one band, while providing coverage on another band. Such a solution eliminates the isolation requirement altogether, resulting in shorter masts. Installation as well as site acquisition is simplified. In other words, Capital Expenditures (CAPEX) are significantly reduced.

All of Axell Wireless repeaters are monitored by an advanced and user-friendly supervision system, leading to less outage time and thereby to greater revenue.

PRODUCT BENEFITS

- › Cover large areas at a minimised cost
 Through a New Generation of GSM repeaters you will be able to cover larger areas through:
 - 20W per carrier is achieved with Axell Wireless repeater
 - Reduced cost of site deployment by employing the Frequency Translating concept
 - Quick & easy site acquisition since there is no need for line of sight between base station and repeater
- › Truly EDGE compatible with a very low EVM value
- › Effective Rollout and management of network elements
 An efficient rollout and a fully functional operations & maintenance form the basis for cost-effective planning of network extensions:
 - Central management solution with advanced Remote Control and Supervision tools
 - Short learning curve through fast repeater set-up and user-friendly commissioning tool
 - Reporting tools enabling optimised planning of network extension

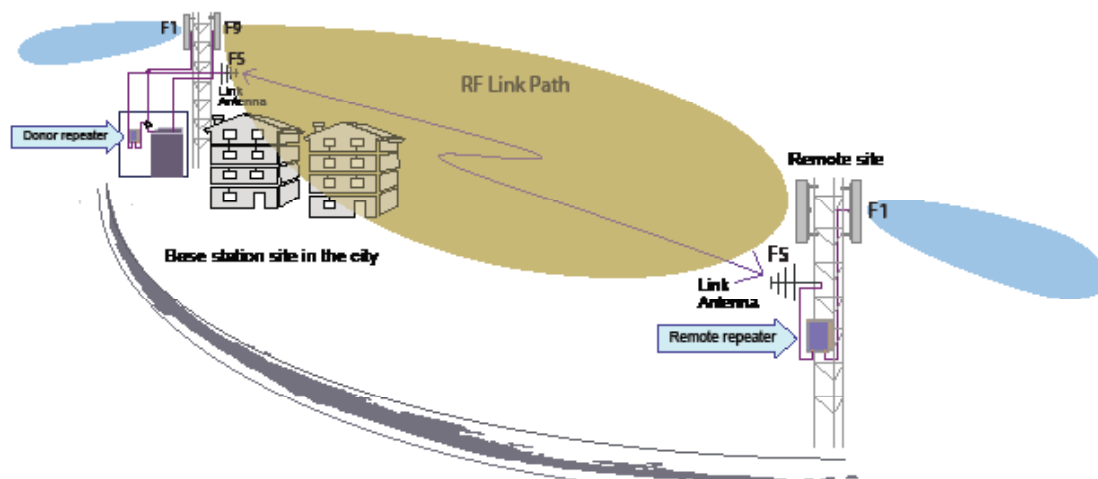
CSFT822/4	Channel Selective Frequency Translating GSM850 Repeater
CSFT922/4	Channel Selective Frequency Translating GSM900 Repeater
CSFT1822/4	Channel Selective Frequency Translating GSM1800 Repeater
CSFT1922/4	Channel Selective Frequency Translating GSM1900 Repeater
CSFT81922/4	Channel Selective Band Shifting GSM850 to 1900 Repeater
CSFT91822/4	Channel Selective Band Shifting GSM900 to 1800 Repeater
CSFT18922/4	Channel Selective Band Shifting GSM1800 to 900 Repeater
CSFT91822R	Channel Selective Band Shifting GSM-R900 to 1800 Repeater

FREQUENCY TRANSLATING

A Frequency Translating EDGE Repeater provides much larger coverage than a conventional repeater does. This is due to the higher output power that is realized through decreasing the isolation requirements. As a result, a fewer number of units need to be installed and considerable cost-savings are achieved.

Frequency translation technology allows the use of an omni directional antenna at the repeater site. By shifting the frequency, the isolation requirements are reduced and lower masts can therefore be used. This also enables high output powers, in other words, large areas can be covered at a minimised cost.

1. The donor unit is installed next to the base station where the signal is coupled off via a directional coupler.
2. Following frequency translation, the signals are transmitted on a link antenna and received at the remote site where signals are converted back to the original frequencies.
3. Finally, the signals are amplified in the remote unit and then transmitted on a server antenna.



The donor unit is available in two types:

The Single Donor (SD) unit has one input connector. The input signal from the BTS is split up within the repeater unit. In the opposite direction – in the uplink – the signals are combined within the repeater before being sent to the BTS.

The Double Donor (DD) unit has dual inputs. This can be used in combination with a BTS that uses air combining, and hence has a separate antenna for each TRU. A double donor unit can alternatively handle two signals from two separate BTS.

The remote unit is available in two types:

In an Internal combining Remote (IR) unit output from the power amplifiers in the downlink is combined and filtered before being passed on to the server antenna. In the uplink the signal is separated within the remote unit.

An External combining Remote (ER) unit has two server antenna ports and the signal is combined in the air. Since the ER model needs no combiner the output signal and gain is 3dB higher than in the IR model.

SPECIFICATIONS

Frequency range	850 MHz	900 MHz E-GSM	900 MHz P-GSM	900 MHz GSM-R	1800 MHz DCS	1900 MHz PCS
Uplink UL	824 - 849	880 - 915	890 - 915	876 - 880	1710 - 1785	1850 - 1910
Downlink DL	869 - 894	925 - 960	935 - 960	921 - 925	1805 - 1880	1930 - 1990

Number of channels 1-4

Output power

Output power/carrier	GSM/GMSK	EDGE/8-PSK average power
Donor unit (SD) DL	+37 dBm	+34 dBm
Donor unit (SD) UL	-10 dBm	-13 dBm
Donor unit (DD) DL	+37 dBm	+34 dBm
Donor unit (DD) UL	-7 dBm	-10 dBm
Remote unit (IR) DL	+40 dBm	+37 dBm
Remote unit (IR) UL	+37 dBm	+34 dBm
Remote unit (ER) DL	+43 dBm	+40 dBm
Remote unit (ER) UL	+37 dBm	+34 dBm

Output power for 4-channel repeater 3 dB lower than specified above.

Gain

Donor Unit (SD)	max 42 dB, adjustable, in 1 dB steps
Donor Unit (DD)	max 45 dB, adjustable, in 1 dB steps
Remote Unit (IR) DL/UL	75 - 105 dB, adjustable, in 1 dB steps
Remote Unit (ER) DL/UL	78 - 108 dB, adjustable, in 1 dB steps
Antenna connectors	DIN 7/16 Female
Base Station connector (Donor unit only)	N-type
Electrical ratings	110/230 V AC, 50/60 Hz (alt. - 48 VDC)

Power Consumption, typical

Frequency	Donor 2 channels	Donor 4 channels	Remote 2 channels	Remote 4 channels
850 & 900 MHz	110 W	240 W	200 W	240 W
1800 & 1900 MHz	150 W	240 W	240 W	270 W
Bandshifter	150 W	240 W	220 W	270 W

Mechanical

Dimensions (2 channels)	540 x 350 x 150 mm (per unit)
Dimensions (4 channels)	540 x 350 x 220 mm (per unit)
Weight (2 channels)	22 kg (per unit)
Weight (4 channels)	33 kg
Enclosure	Aluminium (IP 65)

Environmental

EMC	See compliance below
Operating Temperature	- 25 to + 55 °C
Storage	- 30 to + 70 °C
Humidity	ETSI EN 300 019-2-4 (see compliance below)
MTBF	> 100 000 hrs
Complies with	R & TTE Directive including: ETS EN 301 502 (ETS EN 300 609-4/GSM 11.26) ETS EN 301 498-8 EN 60 950

All data is subject to change without prior notice.

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