

Reference Interconnect Offer

Fix and Mobile (RIO F&M)

TANGO S.A

société anonyme (public limited company)

Established and with its registered office at 177, rue de Luxembourg L-8077 BERTRANGE

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the number B-97152

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1.2	Issued and developed in accordance with the obligations imposed to Tango in the ILR regulation ILR/T17/4 dated 9 June 2017 (market 2/2014)
1.3	Version for public consultation with regulated tariffs for termination of calls originating from EEA countries and new tariffs for termination of calls originating from outside EEA countries
1.4	Version published on 22 nd of January 2018 after completion of public consultation and with effective date 1 st of February 2018.
1.5	<u>Interconnection point addresses</u> : Data Center Bissen (cf.Art. 4.a)

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1. Scope and limits of the Interconnection Offer

This Reference Interconnect Offer (RIO) deals with Interconnect Services offered to a duly authorized Public Network Operator, hereafter called “Interconnected Operator”, for termination of fix and mobile voice calls to the “network of Tango”, hereafter called “Tango”.

This Reference Interconnect Offer has been issued and developed in accordance with the obligations imposed on Tango in the ILR decision 16/208/ILR, market 1/2014 dated 28th November 2016 as well as ILR decision 15/191/ILR dated March 20th 2015.

The Interconnect Services included in this Reference Interconnect Offer encompass the following services:

- Terminating Access Services, as described in section 5;
- Interconnect Link Services, as described in section 6 ;

This Reference Interconnect Offer does not cover calls to numbers which were initially attributed to Tango but which were ported to other networks. Other interconnect services may be negotiated between Tango and the “Interconnected Operator” and included in the final Contract “Interconnect Agreement”.

As a general principle, Tango is not responsible for the content of the communications conveyed through its Interconnect Services.

2. Offer validity

This RIO is valid from 1st January 2017, unless

- a new Reference Interconnect Offer is published by Tango,
- a material change occurs in the laws or regulations, governing telecommunications in Luxembourg.

This RIO may be reviewed and amended in order to comply with applicable rules and regulations. Furthermore, the ILR reserves the right to request or impose on Tango modifications to the Offer.

The validity of the present Reference interconnect offer is determined by the decision 14/177/ILR dealing with the procedures related to the publication of a reference offer dated 28 August 2014 and 16/209/ILR, dated 28 November 2016 (market 1/2014 fixing termination tariffs (FTR), as well as ILR regulation T17/4/ILR dated 9 June 2017 fixing the mobile termination tariffs (MTR) and ILR regulation ILR/T17/3 dated 9 June 2017 (market analysis 2/2014)

Unless defined otherwise, the terms used in this Reference Interconnect Offer must be interpreted in accordance with the Law of February 27th, 2011 Networks and Electronic Communication Services (the "Law") and its implementing regulations.

3. Definitions

Term	Description
Call	The establishment of a connection through a telecommunications network and the transmission and the delivery of a signal from the terminal on which this signal was generated to the terminal to which this signal is addressed or to a network platform or any other facility giving an automatic answer in those cases where the connection cannot be established.
Calling Line Identification (CLI):	The CLI is the number of the calling user conveyed by each Operator's network for each call, it may also be provided by the network or partly by the calling user. This information is flagged either as "network - provided" or as "user provided, verified and passed". If the verification of a user provided CLI fails, the network provided CLI will be transmitted.
Calling Line Identification Presentation (CLIP)	Supplementary service provided for in ITU T Recommendation I.251.3.
Calling Line Identification Restriction (CLIR):	Supplementary service provided for in ITU T Recommendation I.251.4.
Capacity of the Interconnection Link:	The capacity defined for the Interconnection Link and the corresponding Operator access point to which the Interconnected Operator wishes to be connected
ILR	Institut Luxembourgeois de Régulation.
Interconnection Link	A Link between "The Operator's" Access Point and the "Interconnected Operator"
Operator Access point:	The physical interface within the Operator's System from which the Interconnection services can be obtained.
"Tango" or "The Operator":	The operator offering interconnect services through this offer
"Interconnected operator":	An operator wishing to be or being interconnected to "The Operator"
International Public Telecommunication Number	Defined as in ITU T Recommendation E.164.
National (significant) Number	Defined as in ITU T Recommendation E.164.
KPI	Key Performance Indicator
Link	Set of telecommunications facilities necessary to establish one or more transmission paths between two locations.
Parties	"The operator", offering interconnection services and the "Interconnected Operator" buying interconnection services under this agreement.
Point of Interconnection (POI)	The physical point on the Interconnection Link where the telecommunications network of "The Operator" and the "Interconnected Operator's" System are interconnected. The POI is the boundary between "The Operator" and the "Interconnected Operator domains of responsibility".
Reference Interconnect Offer (RIO)	The present offer for interconnection Services
System	All equipment and software which, an Operator

	uses to provide his telecommunications services.
SLA	Service Level Agreement

4. Interconnection Architecture

4.a - Sites

Tango offers following sites that have been designed for use as Interconnection Access Points grounds of their optimal network integration.

Interconnection point addresses:

LuxConnect DC1
4, rue A. Graham Bell
L-3235 Bettembourg

LuxConnect DC2
Z.A.C Klengbousbiérg
L-7795 Bissen / Roost

4.b – System alteration

If Tango wishes to make a system alteration, it shall give the “Interconnected Operator” and the ILR no less than 6 months written notice prior to the date of the anticipated system alteration. The notice shall specify the technical details of the system alteration and the date of the anticipated system alteration. Following such notification Tango shall supply to the connected Operators such information as the “Interconnected Operator” may reasonably request including, to the extent reasonably practicable, the potential impact on the service provided by the “Interconnected Operator” to the End Users.

4.c – Standards

Where relevant, the following standards and procedures will apply:

- Any legal requirements
- ITU-Recommandations
- ETSI standards
- Any other relevant international standards.

The signalling system will be based on the ITU-T SS7 protocols, ISUP Blue Book version. Tests for the SS7 will be performed following the pertinent ITU-T recommendations.

The transmission level of the Interconnection is based on the pertinent ITU-T recommendations for PDH and SDH interfaces.

Other Interconnection options may be provided, and Tango try to comply with any reasonable request for alternative Interconnections, if technically feasible.

5. Service description: Terminating access service

The fix and mobile terminating access service conveys a call handed over from the “Interconnected Operator’s” System, at Tango’s Access Point for termination on any national fix and mobile number of Tango’s network. Tariffs may be different for different categories of services identified by different fix or mobile number ranges.

The tariffs applied by Tango for the provision of the terminating access service are indicated in Annex 1. Only calls that have been setup successfully and answered will be charged. The charging time starts with the answering signal and ends with the first clear signal generated either by the calling or the called party.

Whenever CLI is transferred to the telecommunications network of “The Interconnected Operator”, Tango will not communicate such CLI to an end-user if such CLI is marked as CLIR unless the call is directed to an emergency number.

6. Interconnection Link Service

6.a General

The interconnection link service consists in the physical linking between Tango's Access Point and an "Interconnected Operator" Access Point. The "Interconnected Operator" must interconnect to a Point of Interconnection defined in paragraph 4.a. The relevant charges per interconnect site are defined in Annex 2.

The "Interconnected Operator" is responsible for the dimensioning and payment of the interconnection links required for the conveyance of its own traffic. The "Interconnected Operator" is responsible for the traffic conveyed through its System and handed over at Tango's Access Point in order to use Tango's terminating fix and mobile access services.

- Initial Capacity Order

The initial capacity order must be submitted at the latest 3 months before the launch date of the service. Tango will aim to keep shorter delays taking into consideration its availability and organizational constraints.

- Subsequent Capacity Orders

Any subsequent capacity order has to be submitted at the latest 2 months before the launch date of the additional traffic. Tango will aim to keep shorter delays taking into consideration its availability and organizational constraints.

6.b Co-location & Interconnection link

For Tango-sited interconnection, Tango can provide a custom offer for an Interconnection Link Service or the Operator will supply and operate an Interconnection Link in its entirety.

Tango will provide access to the "Interconnected Operator" at its site for the installation and maintenance of "The Interconnected Operator's" transmission equipment located at this site. Tango will supply a suitable location for the "Interconnected Operator's" transmission equipment used in direct relation with interconnect services, electric power and safekeeping.

In its request for Tango sited interconnection, the "Interconnected Operator" will describe his needs regarding the installation of his transmission equipment on the premises of Tango. Whenever Tango determines that Tango sited interconnection is not reasonably feasible, it will inform the "Interconnected Operator" and the ILR of the reasons of such unfeasibility within 15 days of receiving the request.

Tango will comply, should the ILR find that "The Operator"-sited interconnection is reasonably feasible. In any case, Tango will cooperate with the "Interconnected Operator" in order to find an appropriate alternative solution.

6.c Capacity

"The Interconnected operator" is solely responsible for the dimensioning of the Interconnection links.

6.d Signaling System

The signalling system between "The interconnected Operator" and Tango is specified below.

Other interconnection options. Other Interconnection options may be provided and Tango will try to comply with any reasonable request for alternative Interconnection, if technically feasible.

7. QoS for interconnection services

As far as the terminating access service is concerned, Tango undertakes to ensure for its own System a network failure rate, which does not exceed 1, 5% as a national 3 months average, for failures which are exclusively due to its System. Network failure rate is the ratio between the number of calls handed over by an “Interconnected Operator” to be terminated on Tango’s Network and failed due to insufficiencies in Tango’s Network and the total amount of calls handed over by “The Interconnected Operator” to be terminated on Tango’s network (excluding, in particular, failures due to end-user behaviour and failure of terminal equipment).

In the event of disturbance of the conveyance of traffic within its System, Tango may be constrained to implement the classical measures of traffic regulation (limiting channels, etc.) in order to limit its effect on the quality of the service provided to its customers as well as to the “Interconnected Operator”.

The target figures given above for network failure rate do not include failures that are caused by the mentioned Measures of traffic regulation.

“The Interconnected Operator” and the ILR shall be informed if the above-mentioned measures for traffic regulation have to be applied and how long they may last.

Tango shall respect the quality conditions as they are defined in the applicable legal regulation and in accordance with the quality Tango provides for its retail clients.

8. Procedures for reaching an interconnection agreement

Interconnection agreements shall be negotiated according to the procedures and regulations determined by ILR.

On first demand by the “Interconnected operator”, Tango may request bank guarantees of 10.000€ (of a bank based in Luxembourg) for the provisioning of the interconnect service.

Other “reasonable” guarantees, as payment in advance, may be requested before provisioning of the interconnection service.

Agreement requests shall be addressed to:

Tango S.A.
177, rue Luxembourg
L-8077 BERTRANGE
e-mail : samuel.grosdemange@tangoservices.lu

9. Annexes

All prices mentioned here after are given exclusive of VAT or any other legal taxes, which will be added where applicable.

Annex A – Regulated Tariffs applicable to the Termination Access Service of calls originating within EEA

The tariffs for the terminating Access Service are defined in accordance with ILR regulation.

a) Terminating access service to Tango’s geographic Fix numbers of Calls Originating within the EEA

The following tariffs only apply to the termination of voice calls originating within the EEA (European Economic Area) only if the calling number (the so-called A-Number) is identified as belonging to the numbering plan of one of these countries.

Charge per minute (in €ct excl. VAT)

0.131 eurocent/min for 1st January 2017 – 31 December 2017
 0.135 eurocent/min for 1st January 2018 – 31 December 2018
 0.138 eurocent/min for 1st January 2019 – 31 December 2019

These rates are only applicable to calls originating within the EEA.

b) Terminating access service to Tango’s Mobile numbers of Calls Originating within the EEA

The following tariffs only apply to the termination of voice calls originating within the EEA (European Economic Area) only if the calling number (the so-called A-Number) is identified as belonging to the numbering plan of one of these countries.

Charge per minute (in €ct excl. VAT)

0.89 eurocent/min for 1^{er} July 2017 - 31 December 2019

These rates are only applicable to calls originating within the EEA.

c) List of countries within the EEA where Regulated Tariffs is applied

List of EEA (European Economic Area) countries and territories:

EEA countries : Regulated Rate		
ISO Code	Country Name	Country Code
AUT	Austria	43
BEL	Belgium	32
BGR	Bulgaria	359
HRV	Croatia	385
CYP	Cyprus	357
CZE	Czech Republic	420
DNK	Denmark	45
EST	Estonia	372
FIN	Finland	358

FRA	France	33
GUF	French Guiana	594
DEU	Germany	49
GRC	Greece	30
GLP	Guadeloupe	590
HUN	Hungary	36
ISL	Iceland	354
IRL	Ireland	353
ITA	Italy	39
LVA	Latvia	371
LIE	Liechtenstein	423
LTU	Lithuania	370
LUX	Luxembourg	352
MLT	Malta	356
MTQ	Martinique	596
MYT	Mayotte	262
NLD	Netherlands	31
NOR	Norway	47
POL	Poland	48
PRT	Portugal	351
REU	Reunion	262
ROU	Romania	40
SVK	Slovakia	421
SVN	Slovenia	386
ESP	Spain	34
SWE	Sweden	46
GBR	United Kingdom	44

Annex B – Tariffs applicable to the Termination Access Service of calls originating outside of EEA

With effective date 1st of February 2018, TANGO will apply a surcharge for the termination on both its **Mobile** and **Fixed** networks based on the country of origin of the call when it is originating outside of EEA. The surcharge applied in addition of the regulated tariff (see Annex A) is dependent of 3 Origin of Calls Categories (0, 1, 2 with respective surcharge: **none**, **5€cts/min**, **12€cts/min**):

Origin of Calls Category 0: No surcharge will apply for calls originating from these countries:

Origin Category 0 : Regulated Rate without Surcharge		
ISO Code	Country Name	Country Code
AUS	Australia	61
CAN	Canada	1
CHN	China	86
IND	India	91
PRI	Puerto Rico	1787, 1939
USA	United States Alaska	1907
USA	United States Hawaii	1808
USA	United States of America	1

Origin of Calls Category 1: A surcharge of 5 €cts/min in addition of the regulated rate will apply for calls originating from these countries:

Origin Category 1 : Regulated Rate + Surcharge of 5 €cts/min		
ISO Code	Country Name	Country Code
BGD	Bangladesh	880
BMU	Bermuda	1441
BRA	Brazil	55
BRN	Brunei	673
COL	Colombia	57
CRI	Costa Rica	506
DOM	Dominican Republic	1809, 1829, 1849
EGY	Egypt	20
GIB	Gibraltar	350
HKG	Hong Kong	852
IDN	Indonesia	62
JPN	Japan	81
KWT	Kuwait	965
MYS	Malaysia	60
NZL	New Zealand	64
PAK	Pakistan	92
SGP	Singapore	65
ZAF	South Africa	27
KOR	South Korea	82

CHE	Switzerland	41
TWN	Taiwan	886
THA	Thailand	66
VIR	United States Virgin Islands	1340
VNM	Viet Nam	84

Origin of Calls Category 2: A surcharge of 12 €cts/min in addition of the regulated rate will apply for calls originating from rest of the world including these countries below. This surcharge will apply to any country that is not listed in Categories 0 and 1 and will also apply if A-Number (CLI) is missing or format, content is incorrect, modified or manipulated.

Origin Category 2 : Regulated Rate + Surcharge of 12 €cts/min		
ISO Code	Country Name	Country Code
AFG	Afghanistan	93
ALB	Albania	355
DZA	Algeria	213
ASM	American Samoa	1684
AND	Andorra	376
AGO	Angola	244
AIA	Anguilla	1264
ATA	Antarctica	672
ATG	Antigua and Barbuda	1268
ARG	Argentina	54
ARM	Armenia	374
ABW	Aruba	297
ASC	Ascension	247
AZE	Azerbaijan	994
BHS	Bahamas	1242
BHR	Bahrain	973
BRB	Barbados	1246
BLR	Belarus	375
BLZ	Belize	501
BEN	Benin	229
BTN	Bhutan	975
BOL	Bolivia	591
BIH	Bosnia and Herzegovina	387
BWA	Botswana	267
VGB	British Virgin Islands	1284
BFA	Burkina Faso	226
BDI	Burundi	257
KHM	Cambodia	855
CMR	Cameroon	237
CPV	Cape Verde	238
CYM	Cayman Islands	1
CAF	Central African Republic	236
TCD	Chad	235
CHL	Chile	56
COM	Comoros	269
COG	Congo	242

COK	Cook Islands	682
CUB	Cuba	53
COD	Democratic Republic of the Congo	243
DGA	Diego Garcia	246
DJI	Djibouti	253
DMA	Dominica	1767
TLS	East Timor	670
ECU	Ecuador	593
SLV	El Salvador	503
GNQ	Equatorial Guinea	240
ERI	Eritrea	291
ETH	Ethiopia	251
FLK	Falkland Islands	500
FRO	Faroe Islands	298
FJI	Fiji	679
PYF	French Polynesia	689
GAB	Gabon	241
GMB	Gambia	220
GEO	Georgia	995
GHA	Ghana	233
GRL	Greenland	299
GRD	Grenada	1473
GUM	Guam	1671
GTM	Guatemala	502
GIN	Guinea	224
GNB	Guinea-Bissau	245
GUY	Guyana	592
HTI	Haiti	509
HND	Honduras	504
IRN	Iran	98
IRQ	Iraq	964
ISR	Israel	972
CIV	Ivory Coast	225
JAM	Jamaica	1876
JOR	Jordan	962
KAZ	Kazakhstan	7
KEN	Kenya	254
KIR	Kiribati	686
KOS	Kosovo	383
KGZ	Kyrgyzstan	996
LAO	Laos	856
LBN	Lebanon	961
LSO	Lesotho	266
LBR	Liberia	231
LBY	Libya	218
MAC	Macao	853
MKD	Macedonia	389
MDG	Madagascar	261
MWI	Malawi	265
MDV	Maldives	960
MLI	Mali	223
MHL	Marshall Islands	692

MRT	Mauritania	222
MUS	Mauritius	230
MEX	Mexico	52
FSM	Micronesia	691
MDA	Moldova	373
MCO	Monaco	377
MNG	Mongolia	976
MNE	Montenegro	382
MSR	Montserrat	1664
MAR	Morocco	212
MOZ	Mozambique	258
MMR	Myanmar	95
NAM	Namibia	264
NRU	Nauru	674
NPL	Nepal	977
ANT	Netherlands Antilles	599
SXM	Netherlands Antilles Sint Maarten	1721
NCL	New Caledonia	687
NIC	Nicaragua	505
NER	Niger	227
NGA	Nigeria	234
NIU	Niue	683
NFK	Norfolk Island	672
PRK	North Korea	850
MNP	Northern Mariana Islands	1670
OMN	Oman	968
PLW	Palau	680
PSE	Palestine	970
PAN	Panama	507
PNG	Papua New Guinea	675
PRY	Paraguay	595
PER	Peru	51
PHL	Philippines	63
QAT	Qatar	974
RUS	Russia	7
RWA	Rwanda	250
SHN	Saint Helena	290
KNA	Saint Kitts and Nevis	1869
LCA	Saint Lucia	1758
SPM	Saint Pierre and Miquelon	508
VCT	Saint Vincent and the Grenadines	1784
SMR	San Marino	378
STP	Sao Tome and Principe	239
SAU	Saudi Arabia	966
SEN	Senegal	221
SRB	Serbia	381
SYC	Seychelles	248
SLE	Sierra Leone	232
SLB	Solomon Islands	677
SLB	Solomon Islands	677
SOM	Somalia	252
SSD	South Sudan	211

LKA	Sri Lanka	94
SDN	Sudan	249
SUR	Suriname	597
SWZ	Swaziland	268
SYR	Syria	963
TJK	Tajikistan	992
TZA	Tanzania	255
TGO	Togo	228
TKL	Tokelau	690
TON	Tonga	676
TTO	Trinidad and Tobago	1868
TUN	Tunisia	216
TUR	Turkey	90
TKM	Turkmenistan	993
TCA	Turks And Caicos Islands	1649
TUV	Tuvalu	688
UGA	Uganda	256
UKR	Ukraine	380
ARE	United Arab Emirates	971
URY	Uruguay	598
UZB	Uzbekistan	998
VUT	Vanuatu	678
VEN	Venezuela	58
WLF	Wallis and Futuna	681
WSM	Western Samoa	685
YEM	Yemen	967
ZMB	Zambia	260
ZWE	Zimbabwe	263

In the case Tango is needing to review this Annexe B, updated price list will be communicated to Operators and Regulation Authorities if relevant with a minimum of one month notice.

Annex C – Fees for Interconnection link service

Annual fee per 2Mbit's link covering equipment and maintenance	1.713,-€
One-Off charge per Operator Covering installation and testing	8.149,-€