

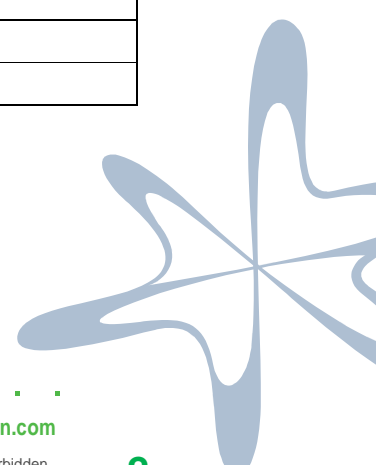


## List of distribution

Entity	Recipient

## Historical Modification Tracking

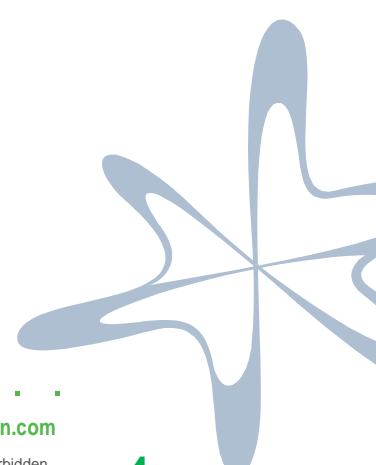
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## 1 INTRODUCTION

### 1.1 Object

The specification of the radio transmitter Linky and downstream interface is a partnership project between EDF and IGNES sponsored by Smart Lyon project accompanied by ADEME as part of the program Development of the Digital Economy - Action Smart Grid for Future Investments

#### 1.1.1 Context

Behavior in terms of power consumption change due to:

- The guidance of public authorities to more energy sobriety
- The energy policies driven by the territories
- The more fundamental changes in lifestyles.

Intelligent electrical systems, in particular through the deployment of smart meters, will provide the public with energy data easily accessible and understandable by all.

This evolution will give rise to the development of new products and services which themselves can influence consumer behaviors and allow living the energy more simply.

The market for smart grids is at the heart of the green economy with a high growth potential including the international market.

#### 1.1.2 Description

This specification is intended to be used by manufacturers of downstream equipment for the radio interface with the ERL device.

The ERL is an electronic device whose function is to broadcast to downstream equipment, under a two-way radio protocol (KNX, Zigbee), the information transmitted via the customer teleinformation (TIC) by the Linky meter.

The ERL is intended for being plugged into the Linky smart meters which will have, under their cover, a location for this insertion.

To be able to communicate properly with the ERL, the downstream equipment must have some particular specification.

This document is a reference for the common behavior that all downstream equipment should have.

## 1.2 Document organisation

This document is organised by life cycles of the product to realize: conception, nominal mode, configuration, special events. It is formulated with requirements in order to be able to follow every item between its specifications to its validation.

## 1.3 Glossary

ERL	Emetteur Radio Linly (Radio Transmitter Linky)
ZB	ZigBee
ZTC	ZigBee Trust Center
ZR	ZigBee Routeur
ZED	ZigBee End Device
LRZR	Linky Ready ZigBee Routeur
LRZED	Linky Ready ZigBee End Device
IC	Install code
TC Link Key	Key used by TC for encryption of network key
MMI	Man Machine Interface
DPT	KNX datapoint

## 1.4 References

Number	Designation	Reference
1	Sorties de télé-information client des appareils de comptage électroniques utilisés en généralisation par ERDF	ERDF-NOI-CPT_54E
2	Spécification technique EDF HN 44-S-81, 2 <sup>ième</sup> édition, mars 2007, Sortie de télé-information client des appareils de comptage électroniques utilisés par le Distributeur EDF.	EDF HN 44-S-81, 2 <sup>ième</sup> édition, mars 2007
3	KNX Handbook Vol 03 Chap 05 part 03. System Specifications; Management; Configuration procedures	KNX 03_05_03 Configuration Procedures v01.05.02 AS
4	KNX Handbook Vol 03 Chap 07 part 02. KNX System Specifications Interworking	KNX 03_07_02 Datapoint Types v01.08.03 AS

	Data point types	
5	KNX Handbook Vol 03 Chap 02 part 05. System Specifications; Communication Media; Radio Frequency	KNX 03_02_05 Communication Medium RF v1.6.01 AS
6	KNX Handbook Vol 08 Chap 02 part 05. KNX System Conformance Testing ; Medium Dependant Layers tests; RF Physical and Data Link Layer Tests	KNX 8_2_5 RF_2_2_01AS
7	ZigBee Home Automation Public Application Profile Home Automation Public Application Profile	ZigBee Profile: 0x0104 Revision 29, Version 1.2 ZigBee Document 05-3520-29
8	ZigBee Over-the-air Upgrading cluster	Revision 18, Version 1.0, March 14, 2010
9	KNX data security	AN158 v02 KNX Data security
10	KNX RF S mode device profile	AN160 v02 RF S-Mode device Profiles
11	■ KNX Handbook Vol 07 Chap 60 part 01 Metering; Metering M-Bus Data Collector; Functional Blocks	KNX 07_60_01 Metering M-Bus Data Collector v01.04.08 AS

## 2 CONCEPTION PHASE

### 2.1 Hardware requirements

#### 2.1.1 Electronic architecture

CON-SUE-HDW-FC-001	<b>Implement following specific characteristics for CPU</b>	1.0
The downstream interface must have a wireless chip that fully supports at least one the following solutions: - ZigBee Pro 2012; ZigBee will operate in 2.4 GHz radio band. - or KNX RF Multi with Fast Link Acknowledgement (frequency band 868 MHz)		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) :	Derived	

#### 2.1.2 Man Machine Interface

CON-SUE-HDW-FC-002	<b>Allow manual equipment configuration</b>	1.0
The downstream interface must have at least a Push Button or any kind of MMI to launch creating a link with the ERL.		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) :	Derived	

#### 2.1.3 Clock

On the ERL, there is no clock to manage the periodic send of data based on real hours.

The historical TIC does not give the hour.

In order to manage this kind of data reception, it is recommended but not mandatory to implement a RTC in the downstream equipment.

#### 2.1.4 Radio frequency Input / Output

A downstream interface must **satisfy at least one of the two following requirements:**



### 2.1.4.1 ZigBee

CON-ERL-PTC-FC-001	<b>Adapt to the automation network using the ZigBee protocol.</b>	1.0
<p>The ZigBee downstream interface must be able to communicate with the ERL using the ZigBee protocol as following :</p> <p>ZigBee Pro 2012 must be used.</p> <p>ZigBee will operate in 2.4 GHz radio band.</p> <p>It must be compatible with the ZHA1.2 and later versions.</p> <p>Refer to document ref (7)</p>		
Class : Non-functional		Verif. level : verification
Upstream Requirement(s) : Derived		

### 2.1.4.2 KNX

CON-ERL-PTC-FC-002	<b>Adapt to the automation network using the KNX protocol.</b>	1.0
<p>The KNX downstream interface must be able to communicate with the ERL using the KNX protocol as following :</p> <p>The standard KNX to use is the KNX RF Multi with Fast Link Acknowledgement (frequency band 868 MHz KNX RF1.M)</p> <p>Refer to document <a href="#">ref (5)</a></p>		
Class : Non-functional		Verif. level : verification
Upstream Requirement(s) : Derived		

## 2.2 Electromagnetic compatibility requirements

In order to comply with R&TTE directives to get the CE marking, the following standards must be respected.

### 2.2.1 Radio Standards

#### 2.2.1.1 For KNX

CON-CPT-ELM-FC-001	<b>Respect radio standard for KNX emission.</b>	1.0
<p>The KNX downstream equipment must respect the radio standard for KNX emission EN 300220-1 et EN 300220-2</p>		
Class : Non-functional		Verif. level : verification
Upstream Requirement(s) : Derived		

### 2.2.1.2 For ZigBee

CON-CPT-ELM-FC-002	<b>Respect radio standard for ZigBee emission.</b>	1.0
The ZigBee downstream equipment must respect the radio standard for ZigBee emission EN 300328.		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) :	Derived	

### 2.2.2 EMC Standard

#### 2.2.2.1 For KNX

CON-CPT-ELM-FC-003	<b>Respect CEM standard for KNX.</b>	1.0
The KNX downstream equipment must respect the EMC standard for KNX EN 301 489-1 et EN 301 489-3.		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) :	Derived	

#### 2.2.2.2 For ZigBee

CON-CPT-ELM-FC-004	<b>Respect CEM standard for ZigBee.</b>	1.0
The ZigBee downstream equipment must respect the EMC standard for ZigBee EN 301 489-1 et EN 301 489-17.		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) :	Derived	

## 2.3 Automation context requirements

CON-CTX-DOM-FC-001	<b>Respect the security and performance of automation equipment</b>	1.0
The downstream interface must be ZigBee or KNX RF Multi certified.		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) :	Derived	

### 3 NOMINAL USE PHASE

This is the main mode of use, installation of network done, without any addition or removal of device on the network.

NOM-TRF-INF-FP-001	<b>Retrieve information from the ERL device</b>	1.0
The downstream equipment is responsible for retrieving information from the ERL		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) :	Derived	

#### 3.1 Data processing

This paragraph gives the format for all information gathered in the TIC and sent to the downstream equipment for every RF mode.

### 3.1.1 For KNX

#### 3.1.1.1 For the historical physical layer:

TIC ERDF Labels	Information TIC	DPT	
ADCO	Meter's address	28.001	DPT_UTF-8
OPTARIF	Chosen pricing plan	28.001	DPT_UTF-8
ISOUSC	Purchased current	14.019	DPT_Value_Electric_Current
BASE	Basic option index	235.001	DPT_Tariff_ActiveEnergy
		249.001	DPT_DateTime_Tariff_ActiveEnergy
HCHC HCHP	Off-Peak Hours Full Hours	235.001	DPT_Tariff_ActiveEnergy
		249.001	DPT_DateTime_Tariff_ActiveEnergy
EJPHN EJPHM	EJP option Index Normal hours Moving Peak Hours	235.001	DPT_Tariff_ActiveEnergy
		249.001	DPT_DateTime_Tariff_ActiveEnergy
BBRHCJB BBRHPJB BBRHCJW BBRHPJW BBRHCJR BBRHPJR	Tempo option Index : Off peak hours blue days Peak hours blue days Off peak hours white days Peak hours white days Off peak hours red days Peak hours red days	235.001	DPT_Tariff_ActiveEnergy
		249.001	DPT_DateTime_Tariff_ActiveEnergy
PEJP DEMAIN	Start EJP prior notice (30 min) Tomorrow's color	225.003	DPT_TariffNext
PTEC	Current billing period	5.006	DPT_Tariff
IINST (*)	Instant current in Amperes	14.019	DPT_Value_Electric_Current
ADPS (*)	Purchased Power Exceeding Warning	14.019	DPT_Value_Electric_Current
IMAX (*)	Maximum capacity used	14.019	DPT_Value_Electric_Current
PAPP	Apparent power	14.080 Static change of value =500VA Dynamic modeactivation: DPT_start 1.010 Dynamic change of value =50VA Dynamic mode duration = 15min	DPT_Value_ApparentPower

TIC ERDF Labels	Information TIC	DPT	
HHPHC	Peak Hour Off-Peak Hour Schedule	28.001	DPT_UTF-8
MOTDETAT	Meter's status word	28.001	DPT_UTF-8
IINST1 (**)	Instant current Phase 1	244.1200	DPT_Value_Electric_Current_3
IINST2 (**)	Instant current Phase 2		
IINST3 (**)	Instant current Phase 3		
ADIR1 (**)	Alert of current exceeding subscribed value per phase	244.1200	DPT_Value_Electric_Current_3
ADIR2 (**)	Alert of current exceeding subscribed value per phase		
ADIR3 (**)	Alert of current exceeding subscribed value per phase		
IMAX1 (**)	Maximum capacity used Phase1	244.1200	DPT_Value_Electric_Current_3
IMAX2 (**)	Maximum capacity used Phase2		
IMAX3 (**)	Maximum capacity used Phase3		
PMAX (**)	Three phase maximal power reached	14.056	DPT_Value_Power
PPOT (**)	Voltage presence	6.1200	DPT_Phases_Status

(\*): only single phase

(\*\*): only three-phase

### 3.1.1.2 For the standard physical layer:

TIC ERDF Labels	Information TIC	DPT	
ADSC	Meter's Secondary address	28.001	DPT_UTF-8
VTIC	Version of the TIC	28.001	DPT_UTF-8
DATE	Current date and time	19.001	DPT_DateTime
NGTF	Name of the supplier pricing grid	28.001	DPT_UTF-8
LTARTF	Current supplier pricing label	28.001	DPT_UTF-8

TIC ERDF Labels	Information TIC	DPT	
Bits 10 to 13 STGE	Current tariff on supply contract	5.006	DPT_Tariff
Bits 14 & 15 STGE	Current tariff on the network contract.	5.006	DPT_Tariff
EAST	Total active power drawn	13.010	DPT_ActiveEnergy
EASF01 EASF02 EASF03 EASF04 EASF05 EASF06 EASF07 EASF08 EASF09 EASF10	Supplier active power drawn index01 index 02 index 03 index 04 index 05 index 06 index 07 index 08 index 09 index 10	235.001	DPT_Tariff_ActiveEnergy
		249.001	DPT_DateTime_Tariff_ActiveEnergy
EASD01 EASD02 EASD03 EASD04	Distributor active power drawn index01 index 02 index 03 index 04	235.001	DPT_Tariff_ActiveEnergy
		249.001	DPT_DateTime_Tariff_ActiveEnergy
IRMS1	Effective current phase 1	14.019	DPT_Value_Electric_Current
IRMS1(**)	Effective current phase 1		
IRMS2 (**)	Effective current phase 2	244.1200	DPT_Value_Electric_Current_3
IRMS3 (**)	Effective current phase 3		
URMS1	Effective voltage phase 1	14.027	DPT_Value_Electric_Potential
URMS1(**) URMS2 (**) URMS3 (**)	Effective voltage phase 1 Effective voltage phase 2 Effective voltage phase 3	244.1201	DPT_Value_Electric_Potential_3
PREF	Apparent ref. power	14.080	DPT_Value_ApparentPower
		246.080	DPT_DateTime_Value_ApparentPower
Bit 7 STGE	Reference power exceeded	1.005	DPT_Alarm
		245.005	DPT_DateTime_Alarm
PCOUP	Apparent cutoff power	14.080	DPT_Value_ApparentPower
		246.080	DPT_DateTime_Value_ApparentPower
	Apparent cutoff power exceeded (SINIST>PCOUP or SINSTS1>PCOUP/3 or SINSTS2>PCOUP/3 or SINSTS3>PCOUP/3)	1.005	DPT_Alarm
		245.005	DPT_DateTime_Alarm

TIC ERDF Labels	Information TIC	DPT	
SINSTS (*)	Apparent instant drawn power	14.080 Static change of value =500VA Dynamic mode activation: DPT_start 1.010 Dynamic change of value =50VA Dynamic mode duration = 15min	DPT_Value_ApparentPower
SINSTS1 (**) SINSTS2 (**) SINSTS3 (**)	Apparent instant drawn power phase 1 Apparent instant drawn power phase 2 Apparent instant drawn power phase 3	244.1202 Static change of value =500VA Dynamic mode activation: DPT_start 1.010 Dynamic change of value =50VA Dynamic mode duration = 15min	DPT_Value_ApparentPower_3
SMAXSXN	Maximal apparent power drawn	14.080	DPT_Value_ApparentPower
		246.080	DPT_DateTime_Value_ApparentPower
SMAXSXN-1	Max apparent power drawn n-1	14.080	DPT_Value_ApparentPower
		246.080	DPT_DateTime_Value_ApparentPower
SMAXSXN1(**) SMAXSXN2(**) SMAXSXN3(**)	Max apparent power drawn n phase 1 Max apparent power drawn n phase 2 Max apparent power drawn n phase 3	244.1202	DPT_Value_ApparentPower_3
		250.1202	DPT_DateTime_Value_ApparentPower_3
SMAXSXN1-1(**) SMAXSXN2-1(**) SMAXSXN3-1(**)	Max apparent power drawn n-1 phase 1 Max apparent power drawn n-1 phase 2 Max apparent power drawn n-1 phase 3	246.080	DPT_Value_ApparentPower_3
		250.1202	DPT_DateTime_Value_ApparentPower_3
CCASN	Point n on the active load drawn curve	246.056	DPT_DateTime_Value_Power
CCASN-1	Point n-1 on the active load drawn curve	246.056	DPT_DateTime_Value_Power
UMOY1(*)	Mean phase 1	14.027	DPT_Value_Electric_Potential
		246.027	DPT_DateTime_Value_Electric_Potential
UMOY1(**)	Mean phase 1	244.1201	DPT_Value_Electric_Potential_3

TIC ERDF Labels	Information TIC	DPT	
UMOY2(**) UMOY3(**)	Mean phase 2 Mean phase 3	250.1201	DPT_DateTime_Value_Electric_Potential_3
Bits 28 & 29 STGE	Moving peak prior notices	20.1206	DPT_Moving_Peak_Warning
		248.1207	DPT_DateTime_Moving_Peak_Warning
Bits 30 & 31 STGE	Moving peak (PM)	20.1207	DPT_Moving_Peak
DPM1 FPM1	Start of Moving Peak 1 End of Moving Peak 1	242.001	DPT_DateTime_Period
DPM2 FPM2	Start of Moving Peak 2 End of Moving Peak 2	242.001	DPT_DateTime_Period
DPM3 FPM3	Start of Moving Peak 3 End of Moving Peak 3	242.001	DPT_DateTime_Period
MSG1	Short message	247.001	DPT_DateTime_UTF-8
MSG2	Ultrashort message	247.001	DPT_DateTime_UTF-8
PRM	Point of measurement report	28.001	DPT_UTF-8
Bits 0 STGE	State of dry contact	Included in the next DPT	
RELAIS	State of 8 relays	21.1200	DPT_VirtualDryContact
NJOURF	Number of the current day in the calendar	5.010	DPT_Value_1_Ucount
NJOURF+1	Number of the next day in the calendar	5.010	DPT_Value_1_Ucount
PJOURF+1	Next day profile	251.1200	DPT_TariffDayProfile
PPOINTE	Next high day profile	251.1200	DPT_TariffDayProfile
Bits 1 to 3 STGE	Breaker state/kill switch	20.1203	DPT_Breaker_Status
		248.1203	DPT_DateTime_Breaker_Status
Bit 4 STGE	State of the DNO (Distribution Network Operator) cover terminal	1.009	DPT_OpenClose
		245.009	DPT_DateTime_OpenClose
Bit 6 STGE	Excess voltage on one of the phases	1.005	DPT_Alarm
		245.005	DPT_DateTime_Alarm
Bit 8 STGE	Producer/consumer operation	1.1200	DPT_ConsumerProducer
Bit 9 STGE	Active power direction	1.1201	DPT_EnergyDirection
		245.1201	DPT_DateTime_EnergyDirection
Bit 16 STGE	Downgraded clock mode (loss of the internal clock's timestamp)	1.005	DPT_Alarm
		245.005	DPT_DateTime_Alarm



TIC ERDF Labels	Information TIC	DPT	
Bit 17 STGE	State of the remote-information output	20.1208	DPT_TIC_Type (EDF provider)
Bits 19 & 20 STGE	State of output of communication Euridis	20.1204	DPT_Euridis_Communication_Output_Status
Bits 21 & 22 STGE	Status of the PLC link	20.1205	DPT_PLC_Status
Bit 23 STGE	CPL synchronization	1.011	DPT_State
		245.011	DPT_DateTime_State
Bits 24 & 25 STGE	Colour of the day for the time history contract TEMPO	5.006	DPT_Tariff
Bits 26 & 27 STGE	Colour of the following day for the historical contract TEMPO	5.006	DPT_Tariff
EAIT(***)	Total active power injected	13.010	DPT_ActiveEnergy
ERQ1(***)	Total reactive power Q1	13.012	DPT_ReactiveEnergy
ERQ2(***)	Total reactive power Q2	13.012	DPT_ReactiveEnergy
ERQ3(***)	Total reactive power Q3	13.012	DPT_ReactiveEnergy
ERQ4(***)	Total reactive power Q4	13.012	DPT_ReactiveEnergy
STINSTI(***)	Apparent instant power injected	14.080	DPT_Value_ApparentPower
SMAXIN(***)	Maximal apparent power injected n	14.080	DPT_Value_ApparentPower
		246.080	DPT_DateTime_Value_ApparentPower
SMAXIN-1(***)	Maximal apparent power injected n-1	14.080	DPT_Value_ApparentPower
		246.080	DPT_DateTime_Value_ApparentPower
CCAIN(***)	Point n on the active load drawn curve	246.056	DPT_DateTime_Value_Power
CCAIN-1(***)	Point n-1 on the active load drawn curve	246.056	DPT_DateTime_Value_Power

(\*): only single phase  
(\*\*): only three-phase  
(\*\*\*): only producer mode

### 3.1.1.3 Easy channels

To connect with ERL, the downstream device has to select the relevant datapoints and connection codes for the application.

It has to be noted that as the change between TIC modes (historical or standard) is automatic the downstream device has to connect to all relevant data allowing at configuration allowing an automatic adaptation of the behaviour.

ERL Channel

- **Name:** CH\_TIC
- **ID:** 0589h
- **Classification:** Sensor
- **Functional Block:**
  -
- **General functional description:**

This channel relays the TIC information given by a meter using the TIC connection.

- **Data point list:**

Index	Datapoint Name	DPT	Connection Code	Flags	
0	Launch the temporary sending of drawn power	1.01 0	DPT_Start	CC_Timed	I
1	Launch the sending of all the active tariff energy	1.01 0	DPT_Trigger	CC_Trigger	I
2	Launch the sending of all the prices.	1.01 0	DPT_Trigger	CC_Trigger_Price	I
3	Current date and time slave	19.0 01	DPT_DateTime	CC_DateTime	I
4	Tariff price	19.0 01	DPT_TariffPriceCommodity	CC_TariffPriceCommodity	I
5	TIC Type	20.1 209	DPT_Type_Tic_Channel	CC_Type_Tic_Channel	O
6	Meter's Secondary Address	28.0 01	DPT_UTF-8	CC_Meter_Address	O
7	Version of the TIC	28.0 01	DPT_UTF-8	CC_TIC_Version	O
8	Current date	19.0	DPT_DateTime	CC_DateTime	O

Index	Datapoint Name	DPT		Connection Code	Flags
	and time master	01			
9	Name of the supplier pricing grid	28.0 01	DPT_UTF-8	CC_Supplier_Grid_Price	O
10	Current supplier pricing label	28.0 01	DPT_UTF-8	CC_Supplier_Grid_Label	O
11	Current price on supply contract	5.00 6	DPT_Tariff	CC_Tariff	O
12	Current price on network contract	5.00 6	DPT_Tariff	CC_Network_Tariff	O
13	Total active energy drawn	13.0 10	DPT_ActiveEnergy	CC_ActiveEnergy_Total	O
14	Supplier active energy drawn	235. 001	DPT_Tariff_ActiveEnergy	CC_Tariff_ActiveEnergy_Total	O
15	Supplier active energy drawn timestamped	249. 001	DPT_DateTime_Tariff_ActiveEnergy	CC_DateTime_Tariff_ActiveEnergy_Total	O
16	Distributor active energy drawn	235. 001	DPT_Tariff_ActiveEnergy	CC_Tariff_ActiveEnergy_Network	O
17	Distributor active energy drawn timestamped	249. 001	DPT_DateTime_Tariff_ActiveEnergy	CC_DateTime_Tariff_ActiveEnergy_Network	O
18	Effective current phase 1	14.0 19	DPT_Value_Electric_Current	CC_Electric_Current	O
19	Effective current phase 1 Effective current phase 2 Effective current phase 3	244. 120 0	DPT_Value_Electric_Current_3	CC_Electric_Current_3	O
20	Effective voltage phase 1	14.0 27	DPT_Value_Electric_Potential	CC_Electric_Potential	O
21	Effective voltage phase 1 Effective voltage phase	244. 120 1	DPT_Value_Electric_Potential_3	CC_Electric_Potential_3	O

Index	Datapoint Name	DPT		Connection Code	Flags
	2 Effective voltage phase 3				
2 2	Apparent ref. power	<u>14.0</u> <u>80</u>	DPT_Value_ApparentPower	CC_Apparent_Power_Ref	O
2 3	Apparent ref. power timestamp	<u>246.</u> <u>080</u>	DPT_DateTime_Value_ApparentPower	CC_DateTime_Apparent_Power_Ref	O
2 4	Reference power exceeded	1.00 5	DPT_Alarm	CC_Power_Exceeded	O
2 5	Reference power exceeded timestamped	<u>245.</u> <u>005</u>	<u>DPT_DateTime_Alarm</u>	CC_DateTime_Power_Exceeded	O
2 6	Apparent cutoff power	<u>14.0</u> <u>80</u>	DPT_Value_ApparentPower	CC_Power_CutOff	O
2 7	Apparent cutoff power timestamped	<u>246.</u> <u>080</u>	<u>DPT_DateTime_Value_ApparentPower</u>	CC_DateTime_Power_CutOff	O
2 8	Apparent instant drawn power	<u>14.0</u> <u>80</u>	<u>DPT_Value_ApparentPower</u>	CC_Apparent_Power	O
2 9	Apparent instant drawn power phase 1 Apparent instant drawn power phase 2 Apparent instant drawn power phase 3	<u>244.</u> <u>1202</u>	<u>DPT_Value_ApparentPower_3</u>	CC_Apparent_Power_3	O
3 0	Apparent max. power drawn n	<u>14.0</u> <u>80</u>	<u>DPT_Value_ApparentPower</u>	CC_Max_Power_N	O
3 1	Apparent max. power drawn n timestamped	<u>246.</u> <u>080</u>	<u>DPT_DateTime_Value_ApparentPower</u>	CC_DateTime_Max_Power_N	O
3 2	Apparent max. power drawn n phase 1 Apparent max. power drawn n phase 2	<u>244.</u> <u>1202</u>	<u>DPT_Value_ApparentPower_3</u>	CC_Max_Power_N_3	O

Index	Datapoint Name	DPT		Connection Code	Flags
	Apparent max. power drawn n phase 3				
33	Apparent max. power drawn n phase 1 timestamped Apparent max. power drawn n phase 2 timestamped Apparent max. power drawn n phase 3 timestamped	<u>250.1202</u>	<u>DPT_DateTime_Value_ApparentPower_3</u>	CC_DateTime_Max_Power_N_3	O
34	Apparent max. power drawn n-1	<u>14.080</u>	<u>DPT_Value_ApparentPower</u>	CC_Previous_Max_Power_N-1	O
35	Apparent max. power drawn n-1 timestamped	<u>246.080</u>	<u>DPT_DateTime_Value_ApparentPower</u>	CC_DateTime_Previous_Max_Power_N-1	O
36	Apparent max. power drawn n-1 phase 1 Apparent max. power drawn n-1 phase 2 Apparent max. power drawn n-1 phase 3	<u>244.1202</u>	<u>DPT_Value_ApparentPower_3</u>	CC_Previous_Max_Power_N-1_3	O
37	Apparent max. power drawn n-1 phase 1 timestamped Apparent max. power drawn n-1 phase 2 timestamped Apparent max. power drawn n-1 phase 3	<u>250.1202</u>	<u>DPT_DateTime_Value_ApparentPower_3</u>	CC_DateTime_Previous_Max_Power_N-1_3	O

Index	Datapoint Name	DPT		Connection Code	Flags
	timestamped				
38	Point n on the active load drawn curve	<u>246.056</u>	<u>DPT_DateTime_Value_Power</u>	CC_N_Point	O
39	Point n-1 on the active load drawn curve	<u>246.056</u>	<u>DPT_DateTime_Value_Power</u>	CC_N-1_Point	O
40	Mean phase voltage 1	14.027	DPT_Value_Electric_Potential	CC_Mean_Voltage	O
41	Mean phase voltage 1 timestamped	<u>246.027</u>	<u>DPT_DateTime_Value_Electric_Potential</u>	CC_DateTime_Mean_Voltage	O
42	Mean phase voltage 1 Mean phase voltage 2 Mean phase voltage 3	<u>244.1201</u>	<u>DPT_Value_Electric_Potential_3</u>	CC_Mean_Voltage_3	O
43	Mean phase voltage 1 timestamped Mean phase voltage 2 timestamped Mean phase voltage 3 timestamped	<u>250.1201</u>	<u>DPT_DateTime_Value_Electric_Potential_3</u>	CC_DateTime_Mean_Voltage_3	O
44	Moving peak prior notices	<u>20.1206</u>	<u>DPT_Moving_Peak_Warning</u>	CC_Moving_Peak_Warning	O
45	Moving peak prior notices timestamped	248.1207	DPT_DateTime_Moving_Peak_Warning	CC_DateTime_Moving_Peak_Warning	O
46	Moving peak (PM)	<u>20.1207</u>	<u>DPT_Moving_Peak</u>	CC_Moving_Peak	O
47	Start of Moving Peak 1 / End of Moving Peak 1	<u>242.001</u>	<u>DPT_DateTime_Period</u>	CC_Moving_Peak_Period_1	O
48	Start of Moving Peak 2 / End of Moving Peak 2	<u>242.001</u>	<u>DPT_DateTime_Period</u>	CC_Moving_Peak_Period_2	O
49	Start of Moving Peak 3 / End of Moving Peak 3	<u>242.001</u>	<u>DPT_DateTime_Period</u>	CC_Moving_Peak_Period_3	O

Index	Datapoint Name	DPT		Connection Code	Flags
50	Short message	<u>247.001</u>	<u>DPT_DateTime_UTF-8</u>	CC_Short_Message	O
51	Ultra short message	<u>247.001</u>	<u>DPT_DateTime_UTF-8</u>	CC_UltraShort_Message	O
52	Point of measurement report	28.001	DPT_UTF-8	CC_Measurement_Point	O
53	Dry Contact	1.001	DPT_Switch	CC_Switch_OnOff_Status	O
54	State of 8 relays	21.1200	DPT_VirtualDryContact	CC_VirtualDryContact	O
55	Number of the current day in the calendar	5.010	DPT_Value_1_Ucount	CC_Day_Number	O
56	Number of the next day in the calendar	5.010	DPT_Value_1_Ucount	CC_Next_Day_Number	O
57	Next day profile	<u>251.1200</u>	<u>DPT_TariffDayProfile</u>	CC_Next_Day_Profile	O
58	Next high day profile	<u>251.1200</u>	<u>DPT_TariffDayProfile</u>	CC_High_Day_Profile	O
59	Kill switch	<u>20.1203</u>	<u>DPT_Breaker_Status</u>	CC_Breaker_Status	O
60	Kill switch timestamped	<u>xx.xxx</u>	<u>DPT_DateTime_Breaker_Status</u>	CC_DateTime_Breaker_Status	O
61	State of the DNO (Distribution Network Operator) cover terminal	1.009	DPT_OpenClose	CC_OpenClose	O
62	State of the DNO (Distribution Network Operator) cover terminal timestamped	<u>245.009</u>	<u>DPT_DateTime_OpenClose</u>	CC_DateTime_OpenClose	O
63	Excess voltage on one of the phases	1.005	DPT_Alarm	CC_Voltage_Exceeded	O
64	Excess voltage on one of the phases timestamped	<u>245.005</u>	<u>DPT_DateTime_Alarm</u>	CC_DateTime_Voltage_Exceeded	O
65	Producer/consumer	<u>1.1200</u>	<u>DPT_ConsumerProducer</u>	CC_ConsumerProducer	O

Index	Datapoint Name	DPT		Connection Code	Flags
	operation				
66	Active energy direction	<u>1.12</u> <u>01</u>	<u>DPT_EnergyDirection</u>	CC_EnergyDirection	O
67	Active energy direction timestamped	<u>245.</u> <u>1201</u>	<u>DPT_DateTime_EnergyDirection</u>	CC_DateTime_EnergyDirection	O
68	Downgraded clock mode (loss of the internal clock's timestamp)	1.00 5	DPT_Alarm	CC_Backup_Clock	O
69	Downgraded clock mode (loss of the internal clock's timestamp) timestamped	<u>245.</u> <u>005</u>	<u>DPT_DateTime_Alarm</u>	CC_DateTime_Backup_Clock	O
70	State of the remote-information output	<u>20.1</u> <u>208</u>	<u>DPT_TIC_Type</u> (EDF provider)	CC_TIC_Type	O
71	Euridis communication output state	<u>20.1</u> <u>204</u>	<u>DPT_Euridis_Communication_Output_Status</u>	CC_Euridis_Communication_Output_Status	O
72	Status of the CPL	<u>20.1</u> <u>205</u>	<u>DPT_PLC_Status</u>	CC_PLC_Status	O
73	CPL synchronization	1.01 1	DPT_State	CC_CPL_Synchro_Status	O
74	CPL synchronization timestamped	<u>245.</u> <u>011</u>	<u>DPT_DateTime_State</u>	CC_DateTime_CPL_Synchro_Status	O
75	Color of the day for the time history contract TEMPO	5.00 6	DPT_Tariff	CC_Tempo_Day_Color	O
76	Color of the following day for the historical contract TEMPO	5.00 6	DPT_Tariff	CC_Tempo_Next_Day_Color	O
77	Total active power injected	13.0 10	DPT_ActiveEnergy	CC_Total_ActivePower	O



Index	Datapoint Name	DPT		Connection Code	Flags
78	Total reactive power Q1	13.0 12	DPT_ReactiveEnergy	CC_Total_Reactive_Power_Q1	O
79	Total reactive power Q2	13.0 12	DPT_ReactiveEnergy	CC_Total_Reactive_Power_Q2	O
80	Total reactive power Q3	13.0 12	DPT_ReactiveEnergy	CC_Total_Reactive_Power_Q3	O
81	Total reactive power Q4	13.0 12	DPT_ReactiveEnergy	CC_Total_Reactive_Power_Q4	O
82	Apparent instant power injected phase 1	<u>14.0</u> <u>80</u>	<u>DPT_Value ApparentPower</u>	CC_Instant_Apparent_Power	O
83	Apparent max. injected power n	<u>14.0</u> <u>80</u>	<u>DPT_Value ApparentPower</u>	CC_Max_Apparent_Power_N	O
84	Apparent max. injected power n timestamped	<u>246.</u> <u>080</u>	<u>DPT_DateTime Value ApparentPower</u>	CC_DateTime_Max_Apparent_Power_N	O
85	Apparent max. injected power n-1	<u>14.0</u> <u>80</u>	<u>DPT_Value ApparentPower</u>	CC_Max_Apparent_Power_N-1	O
86	Apparent max. injected power n-1 timestamped	<u>246.</u> <u>080</u>	<u>DPT_DateTime Value ApparentPower</u>	CC_DateTime_Max_Apparent_Power_N-1	O
87	Point n on the active load injected curve	<u>246.</u> <u>056</u>	<u>DPT_DateTime Value Power</u>	CC_Injected_Point_N	O
88	Point n-1 on the active load injected curve	<u>246.</u> <u>056</u>	<u>DPT_DateTime Value Power</u>	CC_Injected_Point_N-1	O
89	Tariff Option	28.0 01	DPT_UTF-8	CC_Tariff_Option	O
90	Subscribed current PREF	14.0 19	DPT_Value_Electric_Current	CC_Subscribed_Current	O
91	EJP Prewarning or Colour of the following day for the historical contract TEMPO	225. 003	DPT_TariffNext	CC_TariffNext	O
92	Peak/Off Peak hours category	28.0 01	DPT_UTF-8	CC_OffPeak_Category	O

Index	Datapoint Name	DPT		Connection Code	Flags
93	Meter Status	28.001	DPT_UTF-8	CC_Meter_Status	0
94	Overconsumption warning	14.019	DPT_Value_Electric_Current	CC_Over_Electric_Current	0
95	Max Current	14.019	DPT_Value_Electric_Current	CC_Max_Electric_Current	0
96	Overconsumption warning Phase 1-2-3	244.1200	DPT_Value_Electric_Current_3	CC_Over_Electric_Current_3	0
97	Max Current Phase 1-2-3	244.1200	DPT_Value_Electric_Current_3	CC_Max_Electric_Current_3	0
98	Phase Status	6.1200	DPT_Phases_Status	CC_Phases_Status	0
99	Tariff price	19.001	DPT_TariffPriceCommodity	CC_TariffPriceCommodity	0

### 3.1.1.4 Timestamps

#### 3.1.1.4.1 Timestamp for values on change

ERL is able to send the specific value with timestamp stored on change. Downstream device can access thru a request as described in §3.2.3

The list of these values is below (no value for historical TIC concerned, only values for standard TIC and on change mode and same mode of send for on demand mode in these cases)

#### Standard physical layer:

TIC ERDF Labels	Information TIC	Data
Bit 7 of STGE	Reference power exceeded	2 (instantaneous value + timestamp)
MSG1	Short message	2 (MSG + Timestamp)
MSG2	Ultrashort message	2 (MSG + Timestamp)
Bits 1 à 3 of STGE	State of the breaker	2 (Value + timestamp)
Bit 4 of STGE	State of the DNO (Distribution Network Operator) cover terminal	2 (Value + timestamp)
Bit 6 of STGE	Excess voltage on one of the phases	2 (Value + timestamp)
Bit 9 of STGE	Active power direction	2 (Value + timestamp)
Bit 16 of STGE	Downgraded clock mode (loss of the internal clock's timestamp)	2 (Value + timestamp)
Bits 19 & 20 of STGE	Euridis communication output state	2

TIC ERDF Labels	Information TIC	Data
		(Value + timestamp)
Bits 21 & 22 of STGE	Status CPL	2 (Value + timestamp)
Bit 23 of STGE	CPL synchronization	2 (Value + timestamp)

### 3.1.1.4.2 Timestamp of last changed values

ERL is able to send the timestamp of the last change for some specific values.

Data received : instantaneous value + timestamp of the last change.

The list of these values is below (no value for historical TIC concerned, only values for standard TIC and on change mode and same mode of send for on demand mode in these cases)

#### Standard physical layer:

TIC ERDF Labels	Information TIC	Data
PREF	Apparent ref. power	2 (instantaneous values + timestamp of the last change)

### 3.1.1.4.3 Timestamp of occurrence for specific values

ERL is able to send the timestamp of the occurrence of the last change for some specific values.

Data received: instantaneous value + timestamp of the occurrence of the last change

The list of these values is below (no value for historical TIC concerned, only values for standard TIC and on change mode and same mode of send for on demand mode in these cases)

#### Standard TIC :

TIC ERDF Labels	Information TIC	Data
Bits 28 & 29 of STGE	Moving peak prior notices	2 (Values + timestamp of occurrence)

### 3.1.1.4.4 Snapshot for index of energy consumption

ERL is able to send snapshots for some specific values for display for example.  
For groups of data (index for historical TIC and active energy extracted for standard TIC), values can be received with snapshots : one value for each data every 10 mn, first value sent on hour and a timestamp for each value  
Data received : instantaneous values every 10 mn, first value on hour + timestamp of each value

The list of these values is below

Note: If time is not available (i.e Historical TIC), the time stamp value for instantaneous reading is the number of elapsed seconds from the last snapshot. The downstream equipment is then able to calculate the absolute time of the last snapshot.

### Snapshot by steps of 10 mn synchronized on start of hour.

#### Historical physical layer:

TIC ERDF Labels	Information TIC	Data
BASE	Basic option index	2 (Values of snapshot every 10 minutes + timestamp)
HCHC HCHP	Off-Peak Hours Full Hours	4 (Values of snapshot every 10 minutes + timestamp)
EJPHN EJPHM	EJP option Index Normal hours Moving Peak Hours	4 (Values of snapshot every 10 minutes + timestamp)
BBRHCJB BBRHPJB BBRHCJW BBRHPJW BBRHCJR BBRHPJR	Tempo option Index : Off peak hours blue days Peak hours blue days Off peak hours white days Peak hours white days Off peak hours red days Peak hours red days	12 (Values of snapshot every 10 minutes + timestamp)

If there is no way to get the hour (no clock given by any device on the network), the ERL can manage a relative time without starting at the beginning of an hour. It can try to synchronize with the beginning of the period off peak hours / peak hours.

### Standard TIC :

TIC ERDF Labels	Information TIC	Data
EASF01 EASF02 EASF03 EASF04 EASF05 EASF06 EASF07 EASF08 EASF09 EASF10	Supplier active power drawn index01 index 02 index 03 index 04 index 05 index 06 index 07 index 08 index 09 index 10	<b>20</b> (Values of snapshot every 10 minutes + timestamp)
EASD01 EASD02 EASD03 EASD04	Distributor active power drawn index01 index 02 index 03 index 04	<b>8</b> (Values of snapshot every 10 minutes + timestamp)

### 3.1.1.4.5 Apparent power curve data

ERL is able to buffer a table with apparent power (PAPP or SINSTS or SINST1,2,3) with a measurement each 2 seconds and to send it.

For KNX RF, ERL must use a property request as described in §3.1.1.5

ERL stores a table with data each 2 seconds for 2 minutes whatever is the TIC update period

Sequence number	DateTime on 8 bytes	PAPP or SINTS or SINST1+SINST2+SINST3 on 2 bytes
1	Horodate	Value 1
2	/	Value 2 = value read at Horodate+2seconds
...	/	...
60	/	Value n = value read at Horodate+2xn seconds

After the transmission, the table is cleaned and acquisition restarted.

### 3.1.1.5 Interface objects

To connect to the apparent power curve buffered, the downstream device has to use the following interface:

Object Type: 1104 - M\_ELECM

Data and Time read

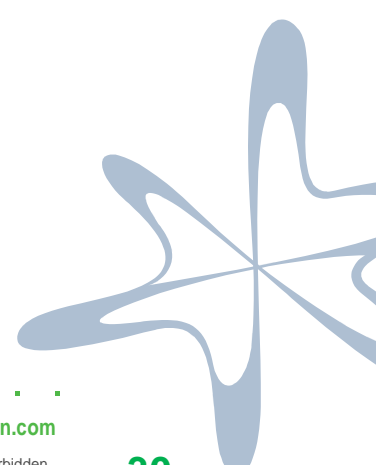
PID 151 with DPT\_DateTime (19.001)

Power read

PID 147 with DPT\_Power (9.024)

DateTime as only to be read on sequence 1 and then power from sequence 1 to 60.

Object type is described in Ref 11



### 3.1.2 For ZigBee

#### 3.1.2.1 For the historical physical layer

TIC ERDF Labels	Information TIC	Cluster	Cluster ID	Attribute	type
ADCO	Meter's address	Metering Cluster	0x0702	MeterSerialNumber	
ISOUSC	Purchased current	Meter Identification Cluster	0x0b01	AvailablePower	
BASE	Basic option index	Metering Cluster	0x0702	CurrentSummationDelivered/Current Tier1SummationDelivered	
HCHC HCHP	Off-Peak Hours Full Hours	Metering Cluster	0x0702	CurrentTier1SummationDelivered CurrentTier2SummationDelivered	
EJPHN EJPHPM	EJP option Index Normal hours Moving Peak Hours	Metering Cluster	0x0702	CurrentTier1SummationDelivered CurrentTier2SummationDelivered	
BBRHCJB BBRHPJB BBRHCJW BBRHPJW BBRHCJR BBRHPJR	Tempo option Index : Off peak hours blue days Peak hours blue days Off peak hours white days Peak hours white days	Metering Cluster	0x0702	CurrentTier1SummationDelivered CurrentTier2SummationDelivered CurrentTier3SummationDelivered CurrentTier4SummationDelivered CurrentTier5SummationDelivered CurrentTier6SummationDelivered	

TIC ERDF Labels	Information TIC	Cluster	Cluster ID	Attribute	type
	Off peak hours red days Peak hours red days				
PAPP	Apparent power	Electrical Measurement Cluster	0x0b04	ApparentPower	
IINST(*)	Instant current in Amperes	Electrical Measurement Cluster	0x0b04	RMSCurrent	Unsigned 16-bit integer
IMAX(*)	Maximum capacity used	Electrical Measurement Cluster	0x0b04	RMSCurrentMax	
IINST1(**)	Instant current Phase 1	Electrical Measurement Cluster	0x0b04	RMSCurrent	Unsigned 16-bit integer
IINST2(**)	Instant current Phase 2	Electrical Measurement Cluster	0x0b04	RMSCurrentB	Unsigned 16-bit integer
IINST3(**)	Instant current Phase 3	Electrical Measurement Cluster	0x0b04	RMSCurrentC	Unsigned 16-bit integer
IMAX1(**)	Maximum capacity used Phase1	Electrical Measurement Cluster	0x0b04	RMSCurrentMax	
IMAX2(**)	Maximum capacity used Phase2	Electrical Measurement Cluster	0x0b04	RMSCurrentMaxB	
IMAX3(**)	Maximum capacity used Phase3	Electrical Measurement Cluster	0x0b04	RMSCurrentMaxPhC	
PMAX(**)	Three phase maximal power reached	Electrical Measurement Cluster	0x0b04	ActivePowerMax	



### 3.1.2.2 For the standard physical layer

TIC ERDF Labels	Information TIC	Cluster	Cluster ID	Attribute	type
ADSC	Meter's Secondary address	Metering Cluster	0x0702	MeterSerialNumber	
VTIC	Version of the TIC	Meter Identification Cluster	0x0b01	SoftwareRevision	
DATE	Current date and time	TIME cluster	0x000A	Time + DstShift + DstStart + DstEnd	string of characters
EAST	Total active power drawn	Metering Cluster	0x0702	CurrentSummationDelivered	
EASF01 EASF02 EASF03 EASF04 EASF05 EASF06 EASF07 EASF08 EASF09 EASF10	Supplier active power drawn index 01 index 02 index 03 index 04 index 05 index 06 index 07 index 08 index 09 index 10	Metering Cluster	0x0702	In consumer mode: CurrentTier1SummationDelivered CurrentTier2SummationDelivered CurrentTier3SummationDelivered CurrentTier4SummationDelivered CurrentTier5SummationDelivered CurrentTier6SummationDelivered .....	
IRMS1	Effective current phase 1	Electrical Measurement Cluster	0x0b04	RMSCurrent	
IRMS2(**)	Effective current phase 2	Electrical Measurement Cluster	0x0b04	RMSCurrentPhB	
IRMS3(**)	Effective current phase 3	Electrical Measurement Cluster	0x0b04	RMSCurrentPhC	
URMS1	Effective voltage phase 1	Electrical Measurement Cluster	0x0b04	RMSVoltage	
URMS2(**)	Effective voltage phase 2	Electrical Measurement Cluster	0x0b04	RMSVoltagePhB	

TIC ERDF Labels	Information TIC	Cluster	Cluster ID	Attribute	type
URMS3(**)	Effective voltage phase 3	Electrical Measurement Cluster	0x0b04	RMSVoltagePhC	
PREF	Apparent ref. power	Meter Identification Cluster	0x0b01	AvailablePower	
Bit 7 de STGE	Reference power exceeded	Electrical Measurement Cluster	0x0b04		Unsigned 16-bit integer
PCOUP	Apparent cutoff power	Meter Identification Cluster	0x0b01	PowerThreshold	
SINSTS(*)	Apparent instant drawn power	Electrical Measurement Cluster	0x0b04	ApparentPower	Unsigned 16-bit integer
SINSTS1(**)	Apparent instant drawn power phase 1	Electrical Measurement Cluster	0x0b04	ApparentPower	Unsigned 16-bit integer
SINSTS2(**)	Apparent instant drawn power phase 2	Electrical Measurement Cluster	0x0b04	ApparentPowerPhB	Unsigned 16-bit integer
SINSTS3(**)	Apparent instant drawn power phase 3	Electrical Measurement Cluster	0x0b04	ApparentPowerPhC	Unsigned 16-bit integer
SMAXSN(*)	Maximal apparent power extracted + timestamp	Electrical Measurement Cluster	0x0b04	ActivePowerMax	

TIC ERDF Labels	Information TIC	Cluster	Cluster ID	Attribute	type
SMAXSN1(**)	Instantaneous apparent power phase 1 + timestamp	Electrical Measurement Cluster	0x0b04	ActivePowerMax	
SMAXSN2(**)	Instantaneous apparent power phase 2 + timestamp	Electrical Measurement Cluster	0x0b04	ActivePowerMaxPhB	
SMAXSN3(**)	Instantaneous apparent power phase 3 + timestamp	Electrical Measurement Cluster	0x0b04	ActivePowerMaxPhC	
MSG1	Short message	Cluster messaging	0x0703	command 0 : display message	
MSG2	Ultrashort message	Cluster messaging	0x0703	command 0 : display message	
PRM	PRM Delivery point	Metering Cluster	0x0702	SiteID	
Bits 0 de STGE	State of dry contact	Cluster ON/OFF	0x0006	client commands 00 and 01	
RELAIS	State of 8 relays	Cluster ON/OFF	0x0006	client commands 00 and 01	
Bit 4 de STGE	State of the DNO (Distribution Network Operator) cover terminal	Metering Cluster	0x0702	Status (bit 2)	
EAIT(***)	Total active power injected	Metering Cluster	0x0702	CurrentSummationReceived	

TIC ERDF Labels	Information TIC	Cluster	Cluster ID	Attribute	type
ERQ1(***)	Total reactive power Q1	Linky : VARh ZigBee: KWh			
ERQ2(***)	Total reactive power Q2	Linky : VARh ZigBee: KWh			
ERQ3(***)	Total reactive power Q3	Linky : VARh ZigBee: KWh			
ERQ4(***)	Total reactive power Q4	Linky : VARh ZigBee: KWh			

(\*): only single phase

(\*\*): only three-phase

### 3.2 Reception

In case of change in the TIC mode, in KNX protocol the datapoint Type of TIC: DPT\_Type\_TIC (00: None, 01: Historic Moonphase, 02 : Historique triphasé, 03 : Standard Monophasé, 04 : Standard Triphasé) is sent by the radio module on the smartmeter. The downstream device shall adapt

#### 3.2.1 Reception at power on

NOM-ERL-MEE-FC-001	Receive data when ERL is started in consumer mode	1.0
The downstream interface must be able to receive the following data at the start of the ERL (excepted if the meter associated is a producer meter).		
Class : Non-functional		Verif. level :
Upstream Requirement(s) : Derived		

##### 3.2.1.1 Historical physical layer, Single Phase:

TIC ERDF Labels	Information TIC
ADCO	Meter's address
OPTARIF	Chosen pricing plan

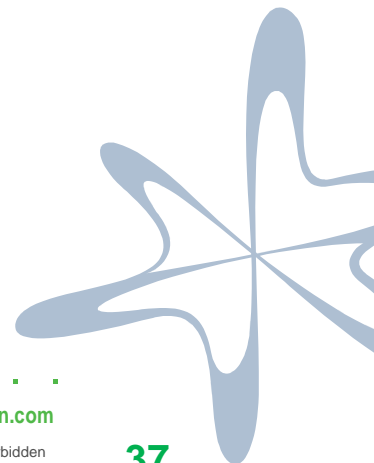
TIC ERDF Labels	Information TIC
ISOUSC	Purchased current
PTEC	Current billing period
ADPS	Purchased Power Exceeding Warning

### 3.2.1.2 Historical physical layer, Three-PHASE:

TIC ERDF Labels	Information TIC
ADCO	Meter's address
OPTARIF	Chosen pricing plan
ISOUSC	Purchased current
PTEC	Current billing period
ADIR1	Alert of current exceeding subscribed value per phase
ADIR2	Alert of current exceeding subscribed value per phase
ADIR3	Alert of current exceeding subscribed value per phase

### 3.2.1.3 Standard physical layer, Single Phase and Three-PHASE:

TIC ERDF Labels	Information TIC
ADSC	Meter's secondary address



TIC ERDF Labels	Information TIC
Bits 10 to 13 of STGE	Current price on supply contract
PREF	Apparent ref. power
Bit 7 of STGE	Reference power exceeded <sup>1</sup>
PCOUP	Apparent cutoff power
Bits 28 & 29 of STGE	Moving peak prior notices <sup>1</sup>
Bits 30 & 31 of STGE	Moving peak (PM)
Bits 0 of STGE	State of dry contact
RELAIS	State of 8 relays
NJOURF	Number of the current day in the calendar
NJOURF+1	Number of the next day in the calendar
Bit 4 of STGE	State of the DNO (Distribution Network Operator) cover terminal <sup>1</sup>
Bit 6 of STGE	Excess voltage on one of the phases <sup>1</sup>
Bit 8 of STGE	Producer/consumer operation
Bit 9 of STGE	Active power direction <sup>1</sup>
Bit 16 of STGE	Downgraded clock mode (loss of the internal clock's timestamp) <sup>1</sup>
Bit 17 of STGE	State of the remote-information output
Bits 19 & 20 of STGE	Euridis communication output state

TIC ERDF Labels	Information TIC
Bits 21 & 22 de STGE	Status CPL
Bit 23 of STGE	CPL synchronization
Bits 24 & 25 of STGE	Color of the day for the time history contract.
Bits 26 & 27 of STGE	Colour of the following day for the historical contract TEMPO

Note 1: instantaneous value, data without DateTime stamp

### 3.2.2 Reception on change

NOM-ERL-MEE-FC-002	Receive data when they are updated	1.0
The downstream interface must be able to receive some specific data, on change of value. The list of these data is below.		
Class :	Non-functional	Verif. level :
Upstream Requirement(s) :	Derived	

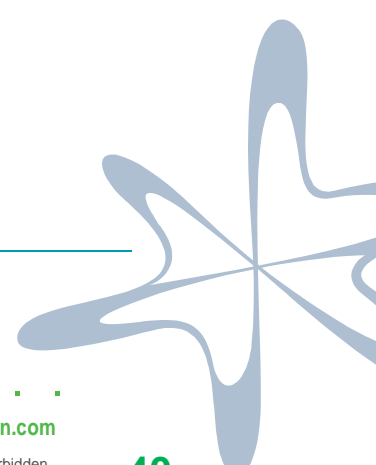
### 3.2.2.1 Historical physical layer, Single Phase:

TIC ERDF Labels	Information TIC
ADCO	Meter's address
PEJP	Start EJP prior notice (30 min)
PTEC	Current billing period
DEMAIN	Tomorrow's color
ADPS	Purchased Power Exceeding Warning

### 3.2.2.2 Historical physical layer, Three-PHASE:

TIC ERDF Labels	Information TIC
ADCO	Meter's address
PEJP	Start EJP prior notice (30 min)
PTEC	Current billing period
DEMAIN	Tomorrow's color
ADIR1	Alert of current exceeding subscribed value per phase
ADIR2	Alert of current exceeding subscribed value per phase
ADIR3	Alert of current exceeding subscribed value per phase
PPOT	Voltage presence

### 3.2.2.3 Standard physical layer, Single Phase and Three-PHASE:





TIC ERDF Labels	Information TIC
ADSC	Meter's Secondary address
VTIC	Version of the TIC
NGTF	Name of the supplier pricing grid
LTARTF	Current supplier pricing label
Bits 10 à 13 of STGE	Current price on supply contract
Bits 14 et 15 of STGE	Current tariff on the network contract.
PREF	Apparent ref. power <sup>1</sup>
Bit 7 of STGE	Reference power exceeded <sup>1</sup>
PCOUP	Apparent cutoff power
Bits 28 & 29 of STGE	Moving peak prior notices <sup>1</sup>
Bits 30 & 31 of STGE	Moving peak (PM)
DPM1	Start of Moving Peak 1 + timestamp
FPM1	End of Moving Peak 1 + timestamp
DPM2	Start of Moving Peak 2 + timestamp
FPM2	End of Moving Peak 2 + timestamp
DPM3	Start of Moving Peak 3 + timestamp
FPM3	End of Moving Peak 3 + timestamp
MSG1	Short message
MSG2	Ultra short message

TIC ERDF Labels	Information TIC
PRM	Point of measurement report
Bits 0 of STGE	State of dry contact
RELAIS	State of 8 relays
NJOURF	Number of the current day in the calendar
NJOURF+1	Number of the next day in the calendar
PJOURF+1	Next day profile
PPOINTE	Next high day profile
Bits 1 to 3 of STGE	State of the breaker
Bit 4 of STGE	State of the DNO (Distribution Network Operator) cover terminal <sup>1</sup>
Bit 6 of STGE	Excess voltage on one of the phases <sup>1</sup>
Bit 9 of STGE	Active power direction <sup>1</sup>
Bit 16 of STGE	Downgraded clock mode (loss of the internal clock's timestamp) <sup>1</sup>
Bit 17 of STGE	State of the remote-information output
Bits 19 & 20 of STGE	Euridis communication output state
Bits 21 & 22 of STGE	Status CPL
Bits 24 & 25 of STGE	Color of the day for the time history contract.
Bits 26 & 27 of STGE	Colour of the following day for the historical contract TEMPO

(\*) : do not send if the value is identical to bits 10 to 13 of STGE

Note 1: instantaneous value, data without DateTime stamp

### 3.2.3 Reception on request

NOM-ERL-MEE-FC-003	Receive data requested	1.0
The downstream interface can ask some data by request.		
Class :	Non-functional	Verif. level :
Upstream Requirement(s) :	Derived	

NOM-ERL-AER-FC-001	<b>Manage the data asked on request and not available in the frame sent by ERL</b>	1.0
A data asked by the downstream equipment can be absent from the teleinformation because it depends on another kind of contract. In this case, the value of this data is a value meaning "not available". If all the data asked on request are "not available", an error must be reported, using the MMI to the user. It could be because the teleinformation is not received by the ERL.		
Class :	Non-functional	Verif. level :
Upstream Requirement(s) :	Derived	

#### 3.2.3.1 Historical physical layer, Single Phase and Three-Phase:

TIC ERDF Labels	Information TIC
ADCO	Meter's address
OPTARIF	Chosen pricing plan
ISOUSC	Purchased current
BASE	Basic option index
HCHC HCHP	Off-Peak Hours Full Hours
EJPHN EJPHM	EJP option Index Normal hours Moving Peak Hours
BBRHCJB BBRHPJB BBRHCJW BBRHPJW BBRHCJR BBRHPJR	Tempo option Index : Off peak hours blue days Peak hours blue days Off peak hours white days Peak hours white days Off peak hours red days Peak hours red days
PEJP	Start EJP prior notice (30 min)

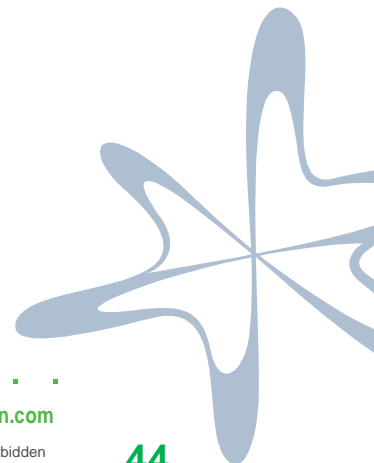
TIC ERDF Labels	Information TIC
PTEC	Current billing period
DEMAIN	Tomorrow's color
PAPP	Apparent power
HHPHC	Peak Hour Off-Peak Hour Schedule
MOTDETAT	Meter's status word
IINST (*)	Instant current in Amperes
IMAX (*)	Maximum capacity used
IINST1 (**)	Instant current Phase 1
IINST2 (**)	Instant current Phase 2
IINST3 (**)	Instant current Phase 3
IMAX1 (**)	Maximum capacity used Phase1
IMAX2 (**)	Maximum capacity used Phase2
IMAX3 (**)	Maximum capacity used Phase3
PMAX (**)	Three phase maximal power reached
PPOT (**)	Voltage presence

(\*) : single phase only

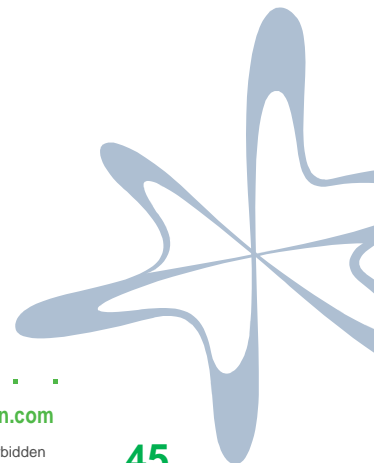
(\*\*): three phases only

### 3.2.3.2 Standard physical layer, Single Phase and Three-Phase

TIC ERDF Labels	Information TIC
ADSC	Meter's Secondary address
VTIC	Version of the TIC
DATE	Current date and time
NGTF	Name of the supplier pricing grid



TIC ERDF Labels	Information TIC
LTARTF	Current supplier pricing label
Bits 10 à 13 de STGE	Current price on supply contract
NTARF	Number of the current tariff index
Bits 14 et 15 de STGE	Current tariff on the network contract.
EAST	Total active power drawn
EASF01 EASF02 EASF03 EASF04 EASF05 EASF06 EASF07 EASF08 EASF09 EASF10	Supplier active power drawn index01 index 02 index 03 index 04 index 05 index 06 index 07 index 08 index 09 index 10
EASD01 EASD02 EASD03 EASD04	Distributor active power drawn index01 index 02 index 03 index 04
IRMS1	Effective current phase 1
IRMS2 (**)	Effective current phase 2
IRMS3 (**)	Effective current phase 3
URMS1	Effective voltage phase 1
URMS2 (**)	Effective voltage phase 2
URMS3 (**)	Effective voltage phase 3
PREF	Apparent ref. power
PCOUP	Apparent cutoff power
SINSTS (*)	Apparent instant drawn power



TIC ERDF Labels	Information TIC
SINSTS1 (**)	Apparent instant drawn power phase 1
SINSTS2 (**)	Apparent instant drawn power phase 2
SINSTS3 (**)	Apparent instant drawn power phase 3
SMAXSN (*)	Apparent max. power drawn + timestamp
SMAXSN1 (**)	Instantaneous apparent power phase 1 + timestamp
SMAXSN2 (**)	Instantaneous apparent power phase 2 + timestamp
SMAXSN3 (**)	Instantaneous apparent power phase 3 + timestamp
SMAXSN-1 (*)	Apparent max. power drawn n-1 + timestamp
SMAXSN1-1 (**)	Maximal apparent power extracted n-1 phase 1 + timestamp
SMAXSN2-1 (**)	PuMaximal apparent power extracted n-1 phase 2 + timestamp
SMAXSN3-1 (**)	Maximal apparent power extracted n-1 phase 3 + timestamp
CCASN	Point n on the active load drawn curve + timestamp
CCASN-1	Point n-1 on the active load drawn curve + timestamp
UMOY1	Mean phase 1 + timestamp
UMOY2 (**)	Mean phase 2 + timestamp
UMOY3 (**)	Mean phase 3 + timestamp
Bits 28 & 29 de STGE	Moving peak prior notices
Bits 30 & 31 de STGE	Moving peak (PM)

TIC ERDF Labels	Information TIC
DPM1	Start of Moving Peak 1 + timestamp
FPM1	End of Moving Peak 1 + timestamp
DPM2	Start of Moving Peak 2 + timestamp
FPM2	End of Moving Peak 2 + timestamp
DPM3	Start of Moving Peak 3 + timestamp
FPM3	End of Moving Peak 3 + timestamp
MSG1	Short message
MSG2	Ultrashort message
PRM	PRM Delivery point
Bits 0 de STGE	State of dry contact
RELAIS	State of 8 relays
NJOURF	Number of the current day in the calendar
NJOURF+1	Number of the next day in the calendar
PJOURF+1	Next day profile
PPOINTE	Next high day profile
Bits 1 à 3 de STGE	State of the breaker
Bit 4 de STGE	State of the client terminal-hider
Bit 6 de STGE	Excess voltage on one of the phases
Bit 8 de STGE	Producer/consumer operation
Bit 9 de STGE	Active power direction
Bit 16 de STGE	Downgraded clock mode (loss of the internal clock's timestamp)
Bit 17 de STGE	State of the remote-information output
Bits 19 & 20 de STGE	Euridis communication output state
Bits 21 & 22 de STGE	Status CPL
Bit 23 de STGE	CPL synchronization

TIC ERDF Labels	Information TIC
Bits 24 & 25 de STGE	Color of the day for the time history contract.
Bits 26 & 27 de STGE	Colour of the following day for the historical contract TEMPO
EAIT	Total active power injected
ERQ1	Total reactive power Q1
ERQ2	Total reactive power Q2
ERQ3	Total reactive power Q3
ERQ4	Total reactive power Q4
SINSTI	Apparent instant power injected
SMAXIN	Apparent max. injected power n
SMAXIN-1	Apparent max. injected power n-1
CCAIN	Point n on the active load drawn curve
CCAIN-1	Point n-1 on the active load drawn curve

(\*) : single phase only

(\*\*): three phases only

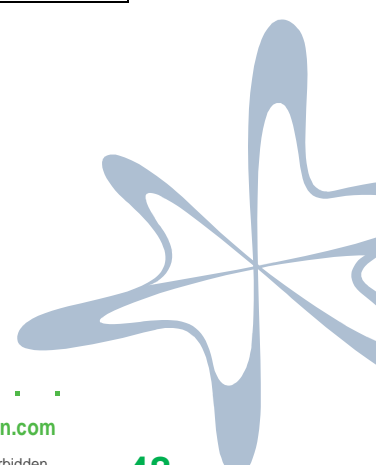
### 3.2.4 Reception on configured demand

#### 3.2.4.1 Initialisation of data to receive on configured demand.

NOM-ERL-MEE-FC-004	Receive data configured on demand	1.0
The data asked in this mode must belong to the following lists.		
Class :	Non-functional	Verif. level :
Upstream Requirement(s) : Derived		

##### 3.2.4.1.1 Historical physical layer

TIC ERDF Labels	Information TIC
-----------------	-----------------





TIC ERDF Labels	Information TIC
BASE	Basic option index
HCHC HCHP	Off-Peak Hours Full Hours
EJPHN EJPHM	EJP option Index Normal hours Moving Peak Hours
BBRHCB BBRHCB BBRHCB BBRHCB BBRHCB BBRHCB BBRHCB	Tempo option Index : Off peak hours blue days Peak hours blue days Off peak hours white days Peak hours white days Off peak hours red days Peak hours red days
PAPP	Apparent power

### 3.2.4.1.2 Standard physical layer, Single Phase and Three-Phase

TIC ERDF Labels	Information TIC
EASF01 EASF02 EASF03 EASF04 EASF05 EASF06 EASF07 EASF08 EASF09 EASF10	Supplier active power drawn index01 index 02 index 03 index 04 index 05 index 06 index 07 index 08 index 09 index 10
EASD01 EASD02 EASD03 EASD04	Distributor active power drawn index01 index 02 index 03 index 04
SINSTS (*)	Apparent instant drawn power
SINSTS1 (**)	Apparent instant drawn power phase 1
SINSTS2 (**)	Apparent instant drawn power phase 2
SINSTS3 (**)	Apparent instant drawn power phase 3
SINSTI	Apparent instant drawn power injected

(\*) : single phase only

(\*\*): three phases only

### 3.2.4.2 Reception of data on configured demand

If the data asked is not available (depending on the type of contract, meter...), it is not sent.

The frame received includes only data available (belonging to the list of data and used with the current configuration of the meter and the contract)

## 3.2.5 Reception of alarms

When the alarm "exceeding power contract" is raised in the TIC, ERL sends this information to all devices interested in as soon as possible (The alarm is sent in less than 2 seconds).

All current processing must be completed. No new processing started before emission of the alarm.

## 3.3 Emission

### 3.3.1 Emission of the list of data to be sent on configured demand

NOM-ERL-PTI-FC-001	<b>Send the list of data to receive from ERL on configured demand</b>	1.0
<p>The downstream equipment must send the list of data to receive from ERL on configured demand.          The data asked in this mode must belong to the lists of § 3.2.4          If the data asked is not available (depending on the type of contract, meter..), it is not sent.</p>		
Class : Non-functional		Verif. level :
Upstream Requirement(s) : Derived		

### 3.3.2 Emission of requests for specific data

NOM-ERL-PTI-FC-002	Ask the value of specific data needed in the lists below	1.0
<p>The downstream equipment can ask the value of some specific value at any moment. These data are listed in § 3.2.3. Data not in the list below cannot be asked. If the data asked is not available (depending on the contract, nature of meter...), it is sent with the value "Not Available"</p>		
Class : Non-functional		Verif. level :
Upstream Requirement(s) : Derived		

### 3.3.3 Emission of data

NOM-ERL-PTI-FC-003	Use the right datapoint when sending data to the ERL in KNX protocol	1.0
<p>Downstream equipment must use the right existing datapoints to send the data in KNX protocol. Common emitted datapoints:</p> <ul style="list-style-type: none"> <li>- Dynamic mode start: DPT_Start</li> <li>- Index emissions trigger: DPT_trigger</li> <li>- Date + Horodate if not available in TIC: DPT_DateTime</li> <li>- Price information out: DPT_TariffPriceCommodity</li> </ul> <p>Type of TIC: DPT_Type_TIC (00: None, 01 : Historic Moonphase, 02 : Historique triphasé, 03 : Standard Monophasé, 04 : Standard Triphasé)</p>		
Class : Non-functional		Verif. level :
Upstream Requirement(s) : Derived		

## 4 CONFIGURATION (ADDITION AND REMOVAL OF DEVICES)

ADR-NTW-ZIG-FC-001	<b>Respect the ZigBee Home Automation profile 1.2</b>	1.0
The utilisation of ZigBee must be compliant with the ZigBee Home Automation profile 1.2 <a href="#">ref (10)</a>		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) : Derived		

ADR-NTW-ZIG-FC-002	<b>Respect the KNX PB procedure</b>	1.0
The utilisation of KNX must be compliant with the PB procedure, refer to <a href="#">ref (3)</a>		
Class :	Non-functional	Verif. level : verification
Upstream Requirement(s) : Derived		

ADR-ERL-NTZ-FC-001	<b>Implement the possibility to create a link with ERL</b>	1.0
To be able to create a KNX or a ZigBee link with the ERL, the downstream equipment must have a push button or any MMI equivalent to launch the association procedure.		
Class :	Non-functional	Verif. level : tests
Upstream Requirement(s) : Derived		

### 4.1 ZigBee

ADR-ERL-NTZ-FC-002	<b>Implement enhanced ZigBee security</b>	1.0
The downstream equipment interface must implement security in order to control the authorization of the devices and frame protection. Security must be managed using : <ul style="list-style-type: none"> <li>An install code to input into the trust centre device in order to encrypt the frames</li> </ul>		
Class :	Non-functional	Verif. level : tests
Upstream Requirement(s) : Derived		

The trust centre can be the downstream equipment to be binded with the ERL or any equipment already present.

ADR-ERL-NTZ-FC-003	<b>Implement ZigBee security</b>	1.0
<p>The two ZigBee security types are :</p> <ul style="list-style-type: none"> <li>• Standard security : A Push Button on the downstream device and a Push Button on the ERL (Push button realized by remote control)</li> <li>• Enhanced security: an action on the trust centre device and the frames encrypted using the install code as an encryption key.</li> </ul> <p>The downstream equipment interface must implement the two levels of security. For the Push Button procedure, refer to <a href="#">ref (7)</a></p>		
Class : Non-functional		Verif. level : tests
Upstream Requirement(s) : Derived		

## 4.2 KNX

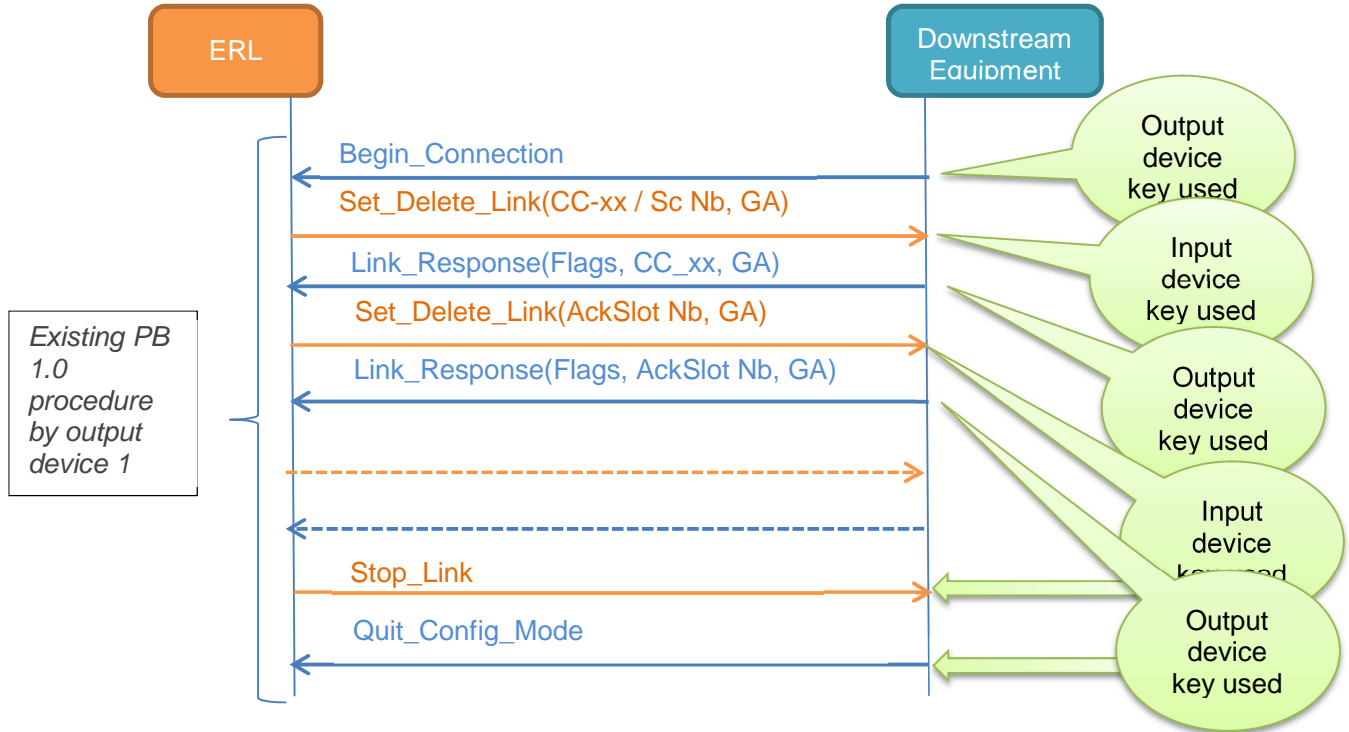
The description of the association procedure is below.

ADR-ERL-NTK-FC-002	<b>Implement enhanced KNX security</b>	1.0
<p>The downstream equipment interface may implement enhanced security in order to control the authorization of the devices and frame protection. It must be possible to enter the ERL install code into the downstream device MMI in order to encrypt the frames.</p>		
Class : Non-functional		Verif. level : tests
Upstream Requirement(s) : Derived		

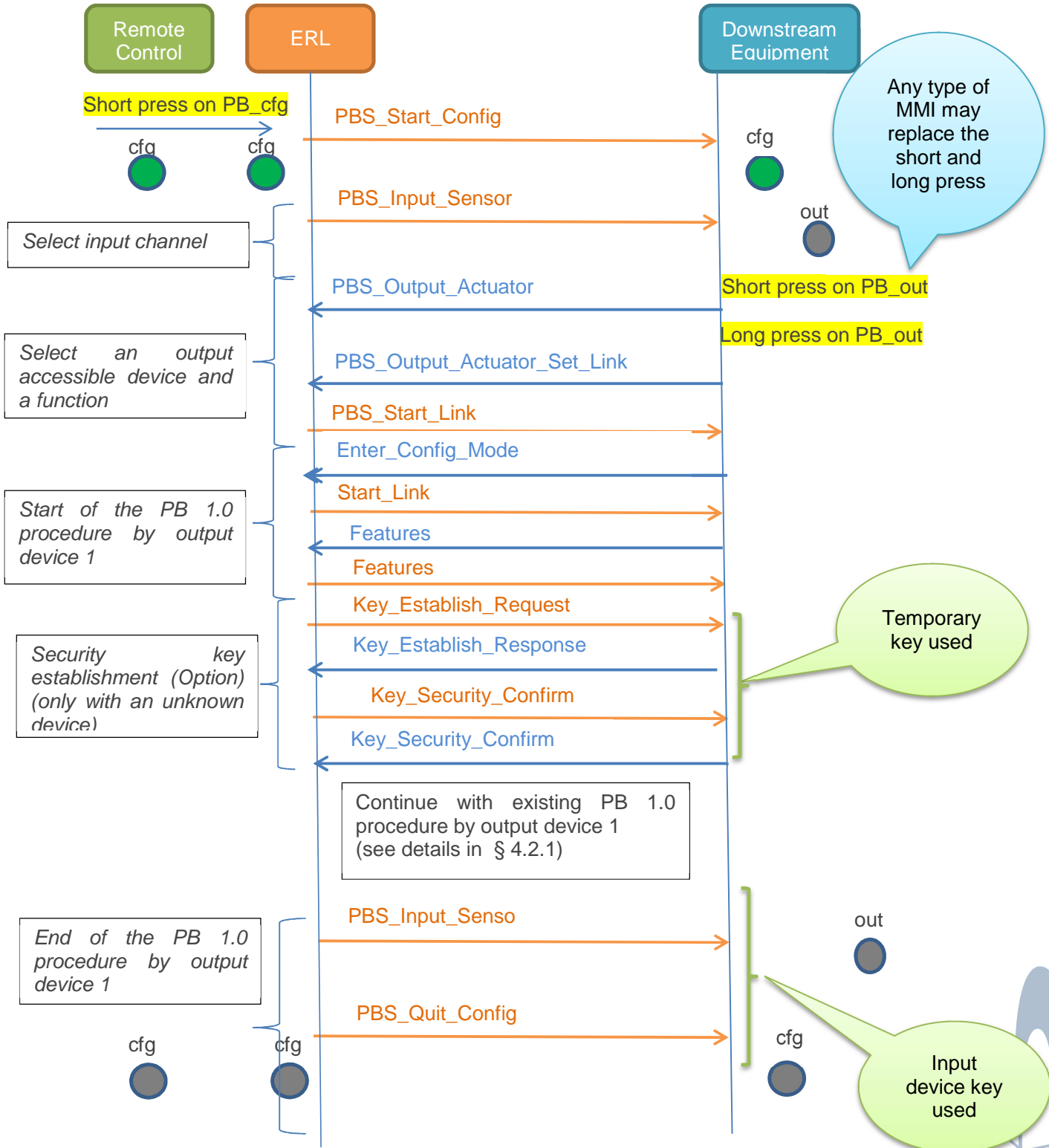
ADR-ERL-NTK-FC-003	<b>Implement KNX security</b>	1.0
<p>The two KNX security types are :</p> <ul style="list-style-type: none"> <li>• Standard security : A Push Button on the downstream device and a Push Button on the ERL (Push button realized by remote control)</li> <li>• Enhanced security: an action on the downstream device and the frames encrypted using the install code as an encryption key.</li> </ul> <p>The downstream equipment interface must implement at least the standard security or may implement the two levels of security. For the Push Button procedure, refer to <a href="#">ref (3)</a> For security, refer to <a href="#">ref (9)</a> see diagrams below.</p>		
Class : Non-functional		Verif. level : tests
Upstream Requirement(s) : Derived		

### 4.2.1 Existing PB 1.0 procedure

The diagram below is common to both procedures (standard and enhanced security).  
It is used and indicated in a square inside the diagrams of each kind of security.



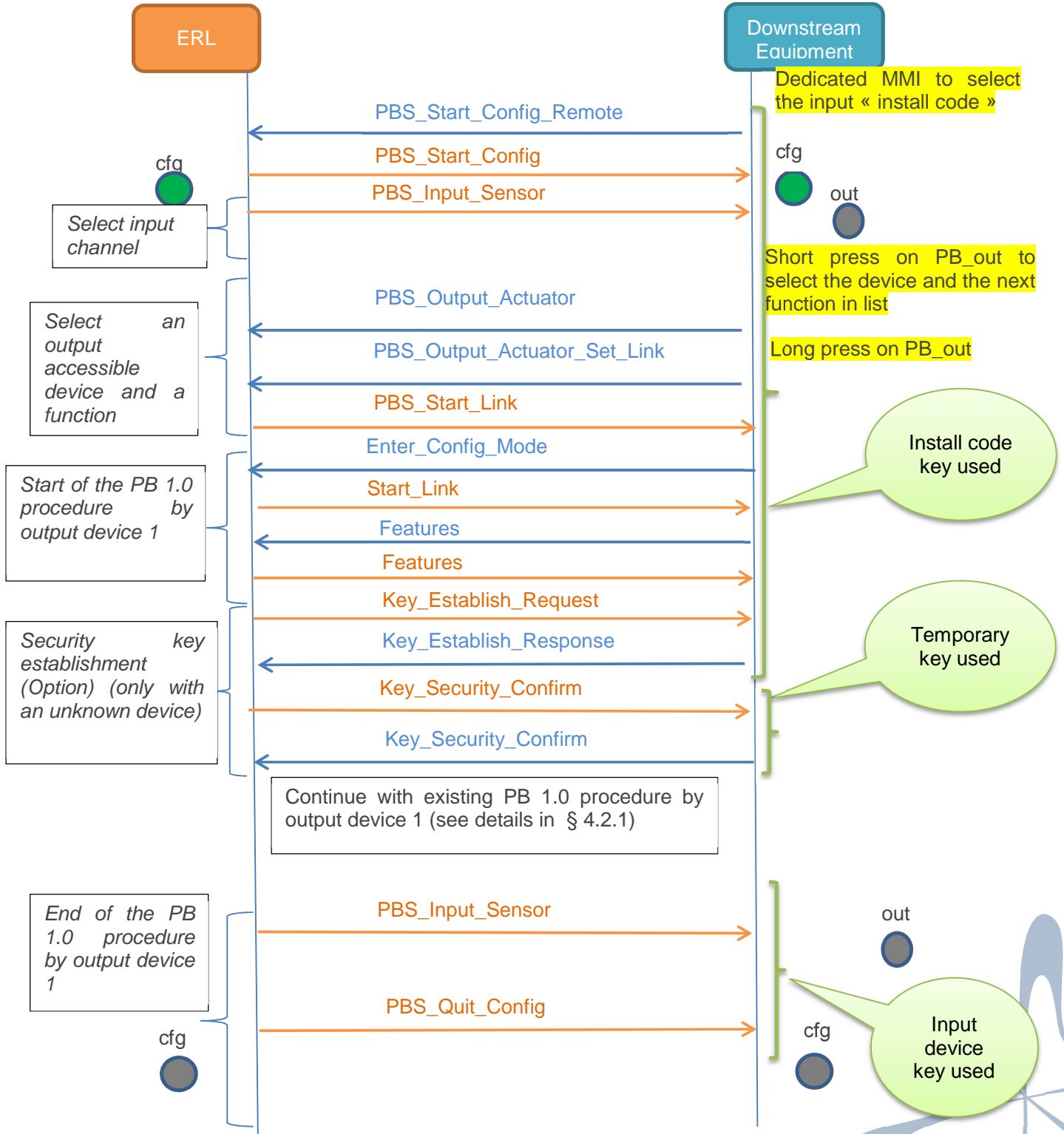
4.2.2 Standard Security





### 4.2.3 Enhanced Security

In this mode and for KNX, the remote control is not used. No push of button to do on the ERL



Details of frames:

E-Mode Device Object (type = 18)									
		Data							
RF Header		11	12	13	14	15	16	17	18 ...
PID_PBS_Start_Config_Remote (66h)	NS	Input Secure id							
PID_PBS_Start_Config (5Ah)	NS	Manuf Code		DevId		PB protocol version			
PID_PBS_Input_Sensor (5Bh)	NS	Protocol Version	Factory Reset Counter	FixedV ar INx	Function	Nb Of Link	Nb Of non acc. devices		
PID_PBS_Output_Actuator (5Ch)	NS	DeviceID		Protocol Version + INx	OUTx	Function	Factory Reset Counter		
PID_PBS_Output_Actuator_Set_Link (5Dh)	NS	DeviceID		Protocol Version + INx	OUTx	Function	Factory Reset Counter		
PID_PBS_Start_Link (60h)	NS	reserved		INx	OUTx	Function	Nb of NA output channel		
PBS_Quit_Config (62h)	NS	reserved							

PBS_Na_Output_Actuator (5Eh)	NS	reserved		INx	OUTx	Function	Nb Of non access devices		
PBS_Na_Output_Actuator_Nb (5Fh)	NS	Device ID		Reserve c	Nb of ch. in NA. Device				
PBS_Na_Output_Actuator_Nb_Resp (64h)	NS	reserved		SN[3]	SN[4]	SN[5]	allocate d number of first channel NA device		
PBS_Stop_Link (61h)	NS	reserved		Status + Inx	OUTx	Function	Nb of NA output channel		
PBS_Input_Sensor_Set_Link (65h)	NS	reserved		INx	OUTx	Function	Nb Of non access devices		
PBS_Delete_Channel (63h)	NS	Device ID		Channel Nb	reserve d	Nb of NA output channel			

Device Object (type = 0)

PID_PB_CONFIG (59)					
	RF Header	Data			
		11	12	13	14
Enter_Config_Mode	NS	10h	01h	00h	00h
Start_Link	NS	20h +Flags + Subfunc.	Manuf code		Nb of GO to link
Channel_Function_Actuator	NS	30h			
Channel_Function_Sensor	NS	40h	Channel code		00h
Set_Channel_Param	NS	50h + Flags	Channel code		00h
Channel_Param_Response	NS	60h + Flags	Param. Index	value	Value
Begin_Connection	NS	70h	00h	00h	00h
Set_Delete_Link	NS	80h + Subfunction	CC or Sc Nb or AckSlot Nb	Group Address	
Link_Response	NS	90h + Flags	CC or AckSlot Nb	Group Address	
Stop_Link	NS	A0h + Flags	00h	00h	00h
Quit_Config_Mode	NS	B0h	00h	00h	00h
Reset_Installation	NS	C0h	00h	00h	00h
Features	NS	D0h + SubFunc.	Physical Req	Security	reserved

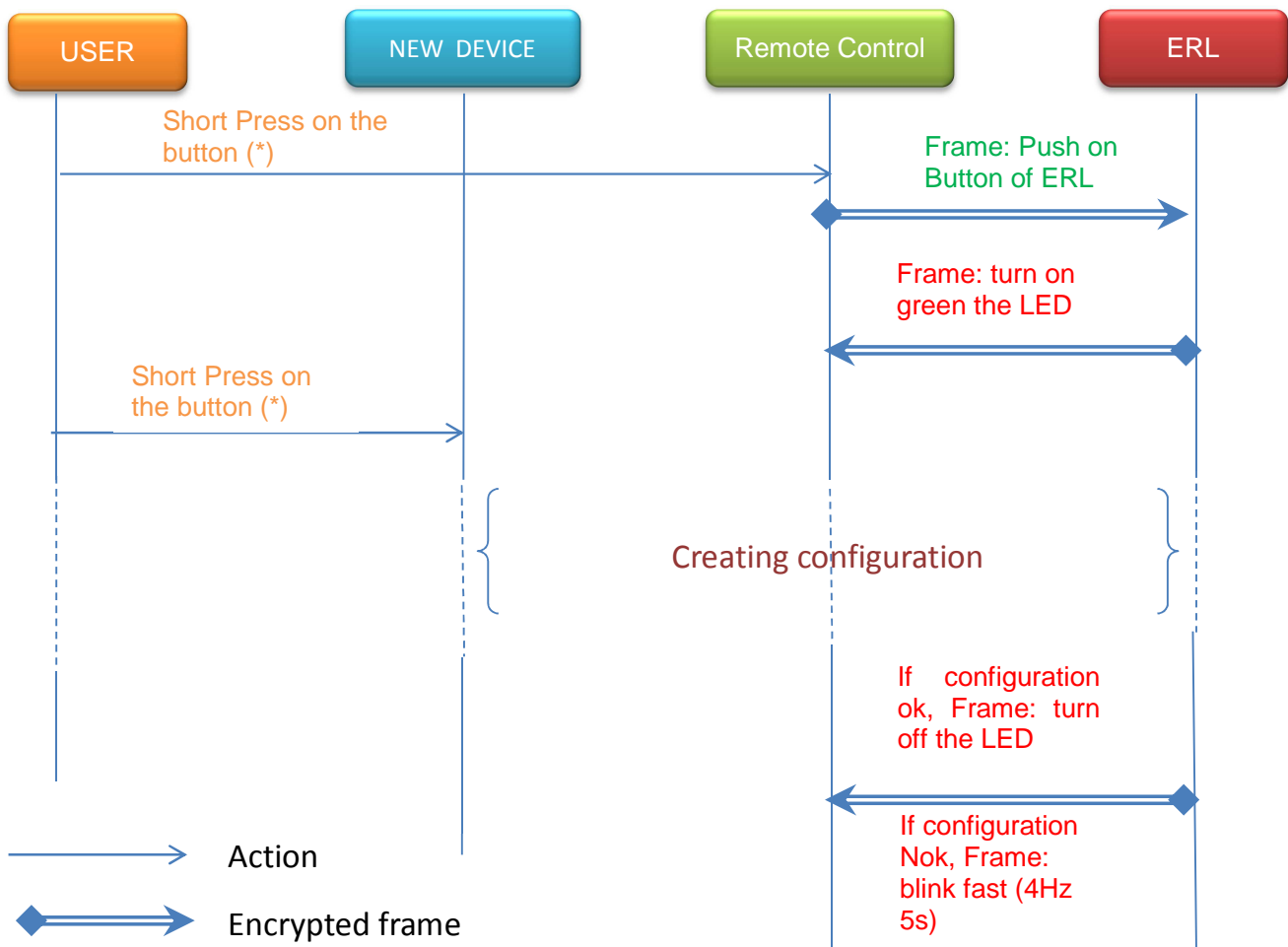
### Security Object (type = 17), 3 new properties

PID_PB_Key_Establish_Request (46h)	NS	A on 35 bytes (recommended by DHEC Report, sect283k1)
PID_PB_Key_Establish_Response (47h)	NS	B on 35 bytes (recommended by DHEC Report, sect283k1)
PID_PB_Security_Confirm (48h)	NS	device key

### 4.3 Set-up procedure with the two levels of security

#### 4.3.1 Standard security

ADR-NTW-CNF-FC-001	Implement the standard security association.	1.0
The downstream interfaces must implement the standard security association.		
Class :	Non-functional	Verif. level : Test
Upstream Requirement(s) :	Derived	

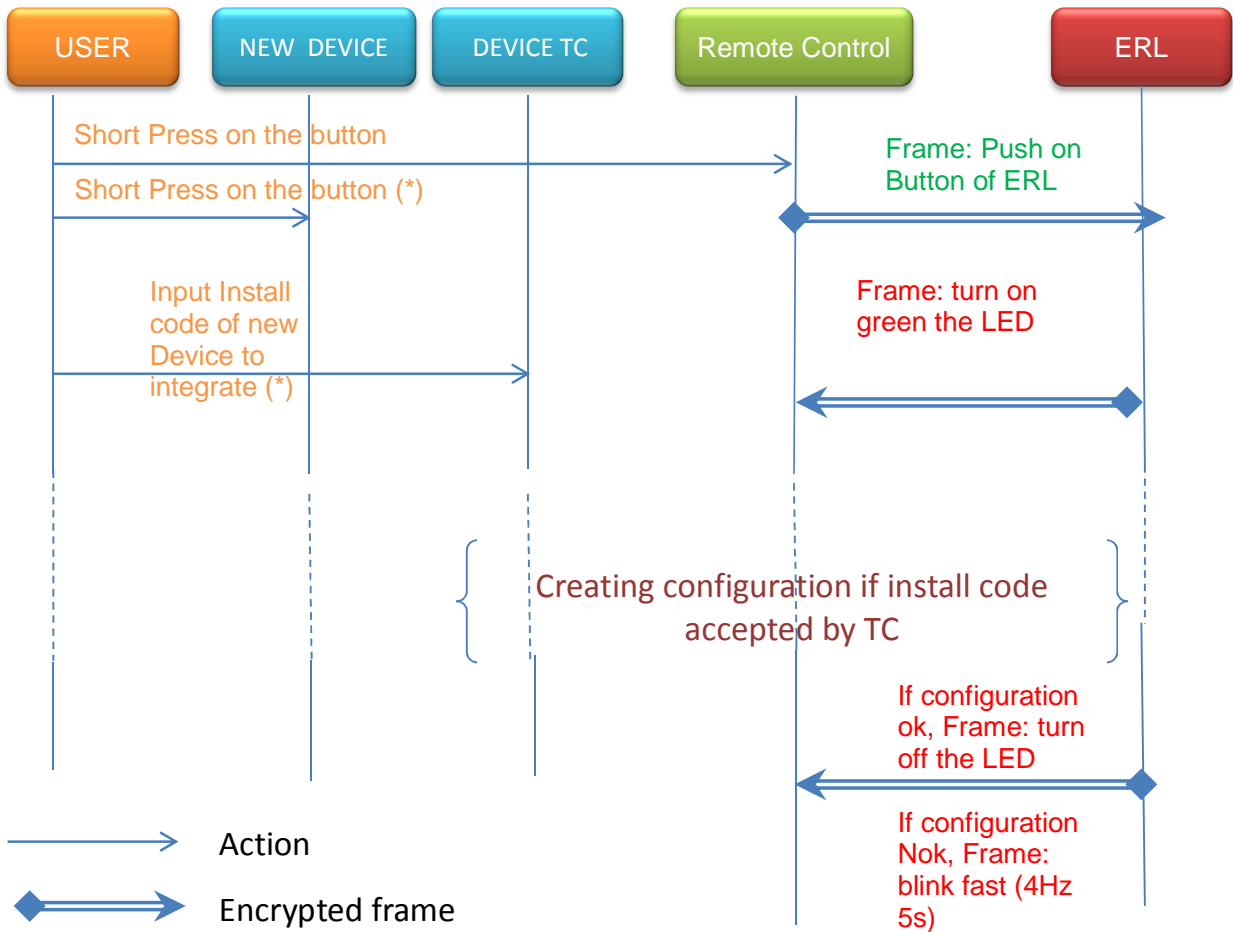


\*: with ZigBee protocol, there no priority for doing the two "Short Press on the button" actions. With KNX, the first action "Short Press on the button" must be done on the remote

### 4.3.2 Enhanced security

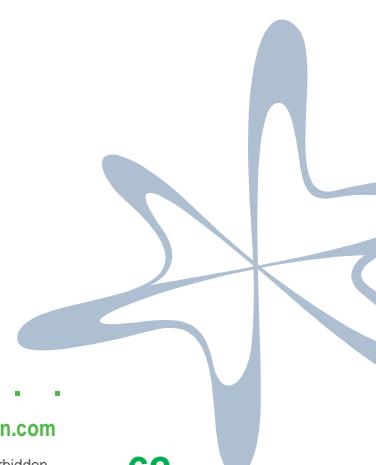
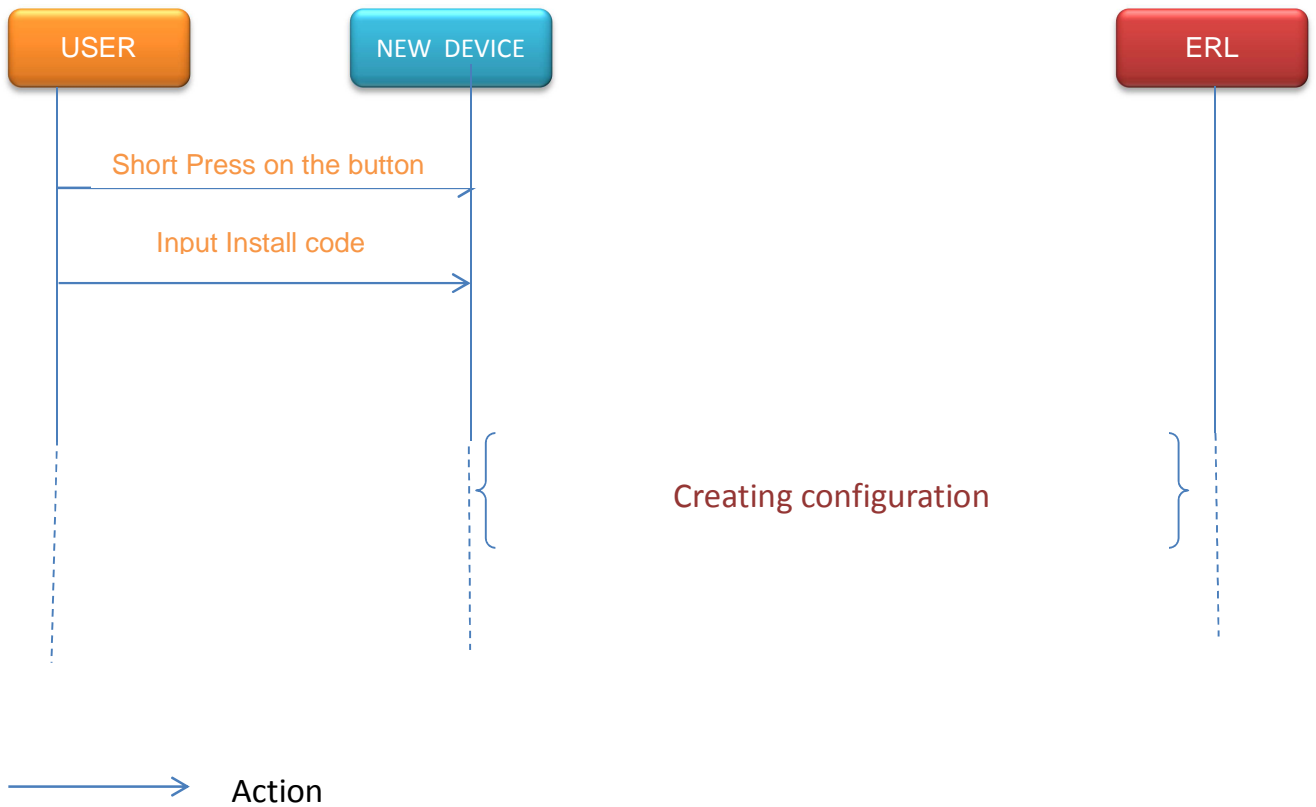
#### 4.3.2.1 ZigBee

ADR-NTW-CNF-FC-002	Implement the ZigBee enhanced security association.	1.0
The downstream interfaces must implement the ZigBee enhanced security association as described below.		
Class :	Non-functional	Verif. level : Test
Upstream Requirement(s) : Derived		



4.3.2.2 KNX

ADR-NTW-CNF-FC-003	Implement the KNX enhanced security association.	1.0
The downstream interfaces must implement the KNX enhanced security association as described below. For KNX enhanced security, no need of the remote control for the association.		
Class :	Non-functional	Verif. level : Test
Upstream Requirement(s) : Derived		



## 5 SPECIAL EVENTS

### 5.1 The owner of the meter contract is modified

ADR-ERL-OWN-FC-001	<b>Adapt the downstream equipment to the modification of the owner of the meter contract</b>	1.0
In case of modification of the owner of the meter contract, the downstream equipment storing the consumption data must be able to erase all the information stored, on customer action.		
Class :	Non-functional	Verif. level : tests
Upstream Requirement(s) :	Derived	

### 5.2 Change of energy supplier

The downstream interfaces shall adapt automatically to a new contract.

### 5.3 A new firmware is downloaded on the ERL

During a firmware download of the ERL, all transmissions are stopped between ERL and the downstream equipment.

Before starting the download of a new firmware, all the downstream equipment will be notified (data "overflow of subscribed power" is set).

At the end of the upgrade, the ERL restarts automatically.