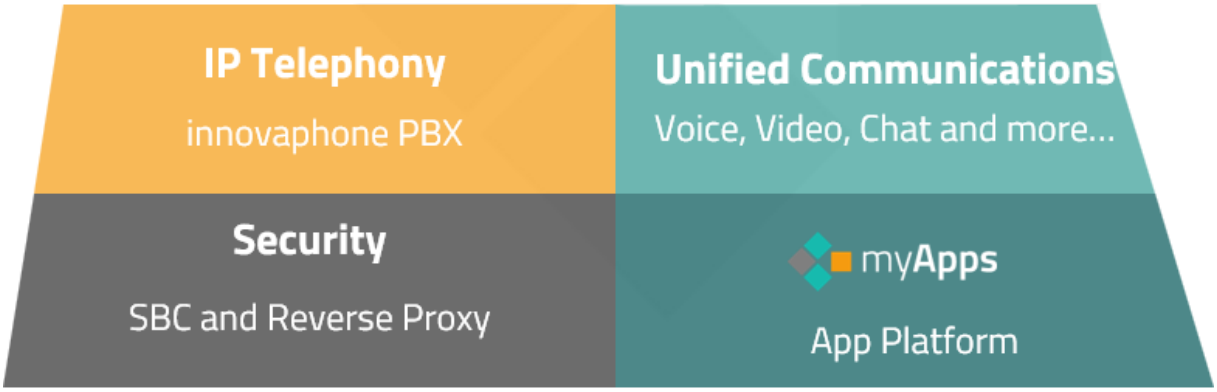
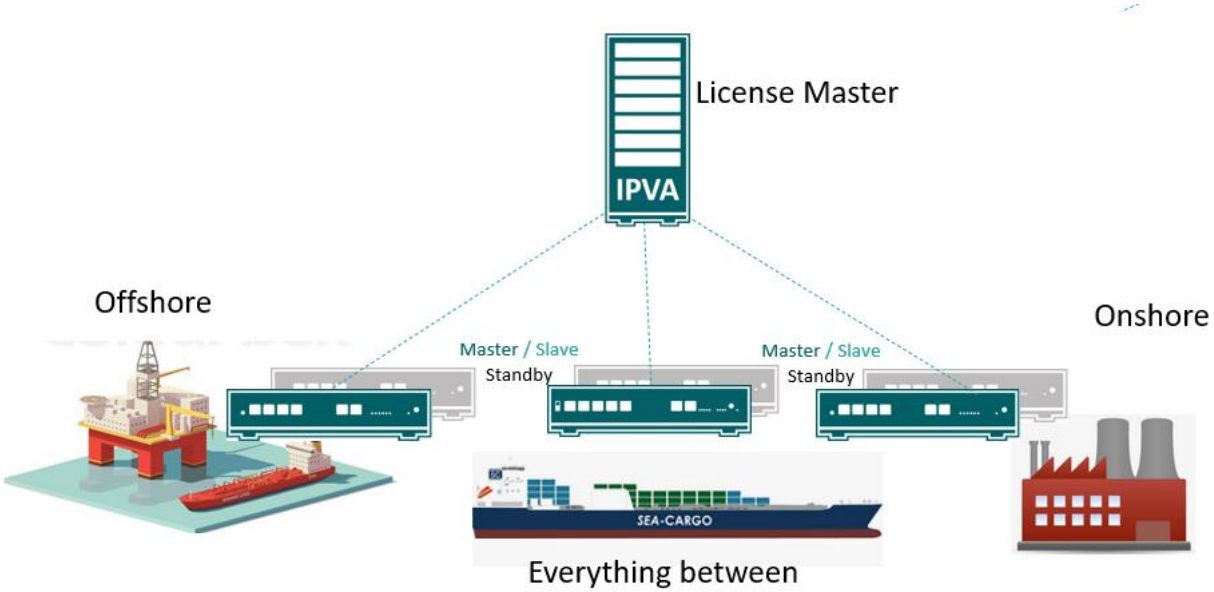
innovaphone Maritime Engineering Guide





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Revision 1.00

Table of Contents

1 Introduction

1.1 About this document

The main scope of this document is to provide guidelines for the onboard communication installation procedures and programing instructions to fulfill and meet the requirements in accordance to DNV TA 848.25 program.

There may also be other tips and tricks or reference links within the framework of what can be included in this context.

The intention is to tailor a typical maritime IP based setup without getting stuck in to any specific vessel classes and forms the basis for easier adaptations of other units like endpoints, switches or applications when needed.

By following these instructions, -mandatory, -branch standard, -nice to have, and finally completing the checklist in chapter 6 an approved system is not far away.

1.2 To whom it may concern

This document is available to everyone, however, in accordance with Innovaphone AG B2B business model an approved partnership agreement is required.
All purchases, installations and support are managed via these established channels.
There is also no overview regarding license types or amount needed.

For questions about partnership etc., please contact: sales@innovaphone.com
https://www.innovaphone.com/en/partner/become-a-partner.html

Or find existing reseller close to you:
https://www.innovaphone.com/en/partner/our-partners.html

1.3 Revision History

Revision:	Date:	Document name	Description of Revision
1.00	12.06.2024	innovaphone Maritime Engineering Guide	First Release Version

1.4 Related Documentation

Doc. NR.	Documentation
TAA00003DD	System Approval
TAA0000252	innovaphone HW
TAA0000054 rev 2	Seacom HW
TAA0000364	Westermo HW

1.5 Requirement to comply

DNV TA 848.25 program “Automatic Telephone System” (Edition 2023)
Rules for classification: Ships — DNV-RU-SHIP Pt.6 Ch.3. Edition July 2023

Summary requirements to comply:

Description	Chapters	Note
Two-way voice communication	4.2.10.1 - 6.10.1.1 - 6.10.1.2 – 4.2.13	DNV-RU-SHIP Pt.6 Ch.3
Paging, Direct in, Zones, PA/GA	4.2.10.2 - 3.3.3	DNV-RU-SHIP Pt.6 Ch.3
Command call, Mooring, (Talk-Back)	4.2.10.3 - 6.10.1.7	DNV-RU-SHIP Pt.6 Ch.3
Night vision	5.5.4.3	DNV-RU-SHIP Pt.6 Ch.3
Minimum 4 simultaneous calls	6.10.1.1	DNV-RU-SHIP Pt.6 Ch.3
Distinguish ring signals	6.10.1.1	DNV-RU-SHIP Pt.6 Ch.3
Priority Calls / Call Intrusion	6.10.1.1 - 3.3.3	DNV-RU-SHIP Pt.6 Ch.3
Central Power backup	6.10.1.1	DNV-RU-SHIP Pt.6 Ch.3
Redundancy	6.10.1.2	DNV-RU-SHIP Pt.6 Ch.3
Noisy environment	6.10.1.3 - 4.2.10.2	DNV-RU-SHIP Pt.6 Ch.3
Extension List next to stations	6.10.1.4	DNV-RU-SHIP Pt.6 Ch.3
Hands-free	6.10.1.7	DNV-RU-SHIP Pt.6 Ch.3

1.6 Abbreviations

Abbreviation	Description	Note
DHCP	Dynamic Host Configuration Protocol	
DISA	Direct Inward System Access	Direct call from public phones to internal phone numbers
IVR	Initiative Voice Response	
UID	User Input Device	E.g. Keyboard, Display, etc.
DNS	Domain Name Server	
ETH	Ethernet	
GUI	Graphical User Interface	
LAN	Local Area Network	Data network
NTP	Network Timing Protocol	
HF	Hands-free	
PBX	Private Branch Exchange	Telephone system, in this project an innovaphone gateway type IP811
PoE	Power over Ethernet	Power supply over Ethernet network/cable
TLS	Transport Layer Security	
TCP	Transmission Control Protocol	
H323	Telephone Protocol	
SIP	Session Internet Protocol	Protocol used for phone signaling
UDP	User Datagram Protocol	

TA	Type Approval	Ref DNV Type Approval program for hardware
Wiki		https://wiki.innovaphone.com/
WAN	Wide Area Network	E.g. Internet
	Type Approval mark	Mandatory requirements to comply

2 Software and Hardware

2.1 Central software - innovaphone PBX-myApps Platform

The PBX-Software is the core of the communication system.
Fully featured two-way real-time communication platform.
All features and logical flows in regards to voice communication is handled by the PBX-Software

https://www.innovaphone.com/en/products/innovaphone-pbx.html

To comply with this TA the central software is to be installed on dedicated innovaphone IP 811-maritime appliance regardless if the software can be used in virtual environments such VMware, Hyper V, Proxmox.

The complete software package consists of two instances:

PBX-software

- Fully featured telephony application

myApps platform installed in combination with PBX-software

- Open architecture for collaboration
- Installed on separate SSD disk in the same dedicated innovaphone appliance.
- myApps client is a secure end-user interface, (native or web, supporting Windows, Mac, Android, iOS) that gives the users and administrator access to all innovaphone and partner applications installed.

Together these components form a hypermodern, flexible, scalable state of the art:

Single spot - Collaboration Platform

https://www.innovaphone.com/en/products/myapps/what-is-myapps.html

Regardless of appliance there is no difference in terms of usage and operation.

Protocols like: SIP/UDP, SIP/TLS, SIP/TCP, H323, H323/TLS, H323/TCP are always supported.

-Only difference may be physical interfaces depending on the choice of appliance.

2.2 Hardware

To cover the most common "onboard communication" maritime requirements several types of appliances may be required. However, it is mandatory within TA to follow and use the devices that are compatible according to the DNV labels.

2.2.1 Central units

Various appliances to cover various needs, to comply with TA IP811-maritime is required.

Description	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type
Model										vmware Hyper-V
	IP311	IP411	IP511	IP811	IP0011	IP3011	IP6013	IP0013	IP1130	IPVA
Power / Ethernet	PoE/2	PoE/2	PoE/2	PoE/2	PoE/2	PoE/2	PoE+/2	PoE+/2	PoE/2	-
FXO / FXS (Analog)	4 / 2	- / 2	- / 4	-	-	-	-	-	-	-
BRI / PRI (ISDN)	-	2 / -	-	5 / -	-	- / 1	- / 2 (4)	-	- / 1	-
SIP Channels (All-IP)	75	75	120	120	120	120	240	240	120	120
Conf Channels HW/SW	- / 15	- / 15	10 / 30	10 / 30	- / 30	30 / 30	60 / 150	- / 150	30 / 30	
Recommended "All-in-one" box scenarios	Up to 50 User	Up to 50 User	Up to 200 User	Up to 200 User	Up to 500 User	Up to 500 User	Up to 1000 User	Up to 1000 User	-	-
Max. registrations*	~12.500	~12.500	~25.000	~25.000	~25.000	~25.000	~25.000	~25.000	-	~100.000
Datasheet	IP311	IP411	IP511	IP811	IP0011	IP3011	IP6013	IP0013	IP1130	IPVA
Comply with TA	x	x	x	√	x	x	x	x	x	x

* Registrations only / 10 calls per user per hour / no UC / no team keys

2.2.2 Analog Units

Various appliances to cover various needs, to comply with TA IP29-8 maritime is required.

Description	Type	Type	Type	Type	Type
Model					
	IP29-2	IP29-4	IP29-8	IP29-20	IP38
Power / Ethernet	PoE/1	PoE/1	PoE/1	PoE+/1	PoE/1
FXS	2 x a/b / RJ 11 (Jack 6P2C)	4 x a/b / RJ 11 (Jack 6P2C)	8 x a/b / RJ 11 (Jack 6P2C)	20 x a/b / 5 x RJ 45 (Jack 8P8C)	-
FXO	-	-	-	-	8 x RJ 11 (Jack 6P2C)
Datasheet	IP29-2	IP29-4	P29-8	P29-20	IP38
Comply with TA	x	x	√	x	x

2.2.3 Stations

Various stations depending on need, See Chapter 5.3 for station used within TA

Description	Type	Type	Type	Type	Type	Type	Type	Type	Type
Models									
	IP101 IP102	IP111	IP112	IP222 IP232	IP270	IP160	SC411 *New IP170* *Available* *2025* *4	SC421 *New IP171* *Available* *2025* *4	SC220 *New IP172* *Available* *2025* *4
Type/Power/Eth	IP/PoE/2	IP/PoE/2	IP/PoE/2	IP/PoE/2	IP/PoE/2	IP/PoE/2	AT/24V/-	AT/24V/-	AT/24V/-
Table/Wall/Flush	√/√/*1	√/√/*1	√/√/*1	√/*2/ -	√/√/-	√/√/-	-/-/√	-/√/-	-/√/-
Speaker/Mic/Handset	√/√/√	√/√/√	√/√/√	√/√/√	√/√/√	√/-/√	√/√/ Accessory	√/√/ Accessory	√/√/ Accessory
Display	√	√	√	√	√	√	√	√	-
Mixed announce support	√	√	√	√	√	√	-	-	-
Headset support	IP102	-	√	√	√	√	√	√	√
Headset PTT	-	-	-	-	-	-	√	√	√
Handsfree	√	√	√	√	√	(Headset)	√	√	√
Extern speaker support	-	-	-	-	-	-	√	√	√
Multiple ring signals	√	√	√	√	√	√	√	√	√
Noisy Milieu	-	-	-	-	-	√	√	√	√
I/O functions relays In/Out	-	-	-	-	-	- / 1	1 / 1	1 / 1	1 / 1
Function key´s	-	8 x 2	8 x 2	8 x 2		10 / *3	3	3	-
Dimmable Keypad/Display	-/√	-/√	-/√	-/√	-/√	On-Off/√	Auto and manual	Auto and manual	Auto and manual
DnD (Do not Disturb)	√	√	√	√	√	-	-	-	-
Wakeup / Voicemail	√	√	√	√	√	√	√	√	√
Command call / Mooring	√	√	√	√	√	√	√	√	√

Environments	Bridge, ECR, Crew cabins, Officers' cabins, Bedrooms, Offices, Rotary room, Conference room, Corridors, Gym, Wardrobe, Hospital, Electrical workshop, Day room, etc.				Engine-Room	Bridge ECR	Engine-Room	Deck
Datasheet	IP101 IP102	IP111	IP112	IP222 IP232	-	IP160	SC411	SC421	SC220
Comply with TA	X	√	X	X	X	X	√	√	√

*1 Accessory for flat, low wall or inclined mounting. *2 Accessory. *3 Activate (0-9) with long press followed by #
*4 New series of IP intercoms is planned during 2025.

3 Security

3.1 General

Security is a very important design element, which includes both reliability operation and unauthorized access. Security will always be an important factor for innovaphone.

Detailed reference links:
https://www.innovaphone.com/en/solutions/security.html

3.2 Infrastructure - Network - Switches

In addition to Innovaphone's own high software security mechanisms, the following subjects must be considered to comply with TA

- Secure physical locations (prevent unwanted access)
- Separate LAN infrastructures alternatively IEEE 802.1Q VLAN should be applied
- All cabling according to maritime requirements
- Dual power
- PoE switches (IEEE802.3af / IEEE802.3at)

Checklist reference: 1.1, 1.2, 1.5

Local network overview: (example)

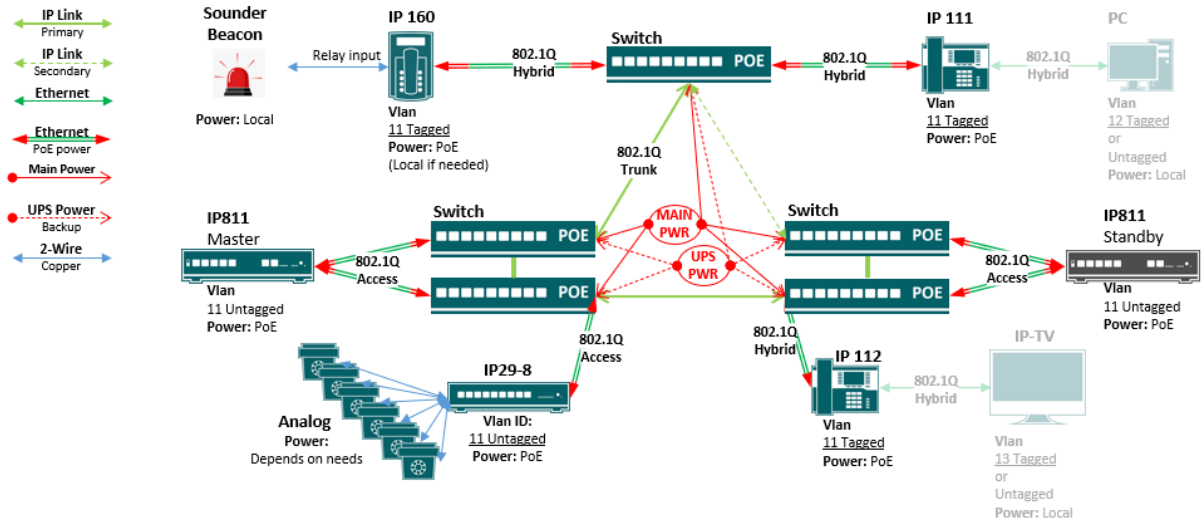


Figure 1

Illustrates a secure and flexible core network (LAN) based on IEEE 802.1 Vlan tagging until endpoint. In addition to savings, it also effectively blocks unwanted access. Here exemplified with several Vlan

Example Id
11, General Voip,
12 Office,
13 IP Tv

If another method is used, such as Vlan Access port type (untagged), it is important to block unwanted access by other means, which is mentioned and must be followed according to chapter 3.4

3.3 Central Software - PBX

In terms of central access there are several methods and different security mechanisms to choose:

- Singel sign-on
- Two-factor authentication (myApps) with domain control
- OAuth2
- Netlogon
- Block unknown IP subnets to register (IP Filter)

Detailed reference links:
https://wiki.innovaphone.com/index.php?title=Reference13r3:PBX/Config/Authentication
https://wiki.innovaphone.com/index.php?title=Howto:Security_works_with_innovaphone
Checklist reference: 2.1, 2.2, 2.3, 2.5, 2.6, 2.7, 2.8

3.4 Hardware (innovaphone stations)

As for innovaphone stations we always recommend to do a Device registration.
Stations will use certificate for Device registration and inherit password from central system and grant central administration, no direct access is needed anymore (default local password will be erased and overwritten)

Also ensure unauthorized access by blocking any available or free open interface (e.g., LAN)

Detailed reference links:
https://wiki.innovaphone.com/index.php?title=Reference13r1:General/Devices-Registration
https://wiki.innovaphone.com/index.php?title=Reference13r1:Interfaces/ETH/Link
https://wiki.innovaphone.com/index.php?title=Reference10:Interfaces/ETH/VLAN
Checklist reference: 2.9

3.5 Hardware (Third party stations)

Always use the highest security recommendations specified by supplier, and make sure no other connection or access to the system will be possible.

Checklist reference: 2.9

4 System design

4.1 PBX Architecture

When preparing and plannings are initiated for a maritime installation it will be an advantage from start to plan in larger scale to gain flexibility and simplicity during commissions.
Typical considerations:

- Are we part of a larger organization?
- Are there more vessels in the fleet?
- Similar work patterns and functions?
- Do we need onshore communication?

-If half of the answers are yes, then there are great synergies in choosing a distributed solution...

Distributed:
Flexible and fast commissioning for several and recurring projects.
The local onboard PBX replicates the settings from a Master PBX (often standing ashore) and become a SlavePBX and operate completely independently as a local PBX, a standby unit can also be connected for local redundancy.
As additional feature all license can be managed from Master to all locations.
Also, landline can be centralized for better cost efficiency.

Local:
A classic local on-site solution.

In this TA we use a local architecture, but there are no technical obstacles to choose the distributed version, all functions will be the same.

4.2 User data

As with all installations system-data need to be collected and set. Normally a mix of end-user and system specific settings. Following data is used in TA

System identification (examples):

Description	PBX name	System name	Domain name
IP 811 Master	pbx	local.com	pbx.local.com
IP 811 Standby	pbx	local.com	stb-pbx.local.com
App Platform / Master	-	local.com	apps.local.com
App Platform / Standby	-	local.com	apps.local.com

Login credential (examples):

Description	User name	User password	Emergency admin password
IP 811 Master	adminv14	Welcome2myApps	Adm: [doeHWV$z"N1y)M PBX: Lqf<8`q|oy/gwqU
IP 811 Standby	adminv14	Welcome2myApps	Adm: !"I.zb[G[|4Rh`] PBX: ~^*-AI};9*Ju!^} **In Standby mode override by master:** Adm: [doeHWV$z"N1y)M PBX: Lqf<8`q|oy/gwqU
App Platform / Master	-	-	Adm: [doeHWV$z"N1y)M
App Platform / Standby	-	-	Adm: !"I.zb[G[|4Rh`] **In Standby mode override by master:** Adm: [doeHWV$z"N1y)M

IP Settings (examples):

Description	IP Adress	Dhcp pool	Note
IP 811 Master-DHCP Server	10.10.10.1	10.10.10.10 - 50	2x Dhcp server is active due to redundancy, same settings except dhcp pool.
IP 811 Standby-DHCP Server	10.10.10.3	10.10.10.60 - 99	
App Platform / Master	10.10.10.2	-	
App Platform / Standby	10.10.10.4	-	
Default GW / Firewall	10.10.10.254	-	Not included in TA
NTP Server	Local (manual)	-	

Number plan and unit examples:

Description	Extension Nr.	Group Nr.	Unit Fixed	Unit Wireless	Call Filter	DDI	Note
Bridge	2001	2000	IP111, SC411 * IP170	IP73 WIFI	FullAccess		See chapter 5.3 for TA Compliance
Bridge W / P	2002	2000	IP111, SC411 * IP170	-	FullAccess		See chapter 5.3 for TA Compliance
Bridge W / S	2003	2000	IP111, SC411 * IP170		FullAccess		See chapter 5.3 for TA Compliance
ECR	2011	2010	IP111, SC411 * IP170	IP73 WIFI	FullAccess		See chapter 5.3 for TA Compliance
Engine	2021	2020	IP160 SC421 * IP171		Normal		See chapter 5.3 for TA Compliance
Deck FWD	2031	2030	IP160 * IP17x		Normal		See chapter 5.3 for TA Compliance
Captain: Office/Rest/Cab	2051	2050	IP1xx IP2xx		FullAccess		See chapter 5.3 for TA Compliance
Crew Cab / officers	2101		IP1xx IP2xx		FullAccess		See chapter 5.3 for TA Compliance

*4 New series of IP intercoms is planned during 2025.

System Functions	Prefix	Note
DISA	2999	Used to reach each individual extension via dtmf
Paging, Intrusion	## (##+Extension)	Direct In (Single extension announcement (Voice Paging) and DnD override
Paging Zone A (All)	#*100	Pagin calls to dedicated PA, PA/GA and or IP speakers/phones
Paging Zone B (X)	#*101	Pagin calls to dedicated PA, PA/GA and or IP speakers/phones
Paging Zone C (X)	#*102	Pagin calls to dedicated PA, PA/GA and or IP speakers/phones
Paging Zone D (X)	#*103	Pagin calls to dedicated PA, PA/GA and or IP speakers/phones
Moring Group	#100	Used for maneuver situations or for other commands within defined area
Voicemail	#99	
PA-Module	#96	Enabling announcement in PA, PA/GA
Landline	0	Prefix for external calls

5 Commissioning

5.1 Prerequisites

All PBX access and programming are done from standard pc via web browser.
The architecture of this TA refers to a completely isolated and self-contained system and requires no other active central components for internal communication except for listed products.

For increased functionality and flexibility, the system can be expanded with:

NTP Server: (Network time protocol)
In cases where time is an important factor, e.g. crossing time zones, an external time server is very useful for the system to keep in track.

Firewall: (external routing)
For landline, updates, remote management over IP an external firewall is to be installed.

5.2 Central Components

Chapter 6.10.1.1 Physical security, Main power and battery backup (UPS)

5.2.1 Passive Components

Cabinet, Racks, Fiber, Ethernet and analog wiring etc.

Plan, Document, Install, Operate and secure your core infrastructure according to DNV-RU-SHIP Pt.6 Ch.3. Edition July 2023
Checklist reference: 1.1, 1.2, 1.6

5.2.2 Active Components

Appliances included of critical communication and comply with requirements of TA

Switches (LAN)
Powered by two individual power sources, one with battery backup (UPS)
Support PoE according to IEEE802.3af / IEEE802.3at
Support and enable IEEE 802.1Q vlan, Spanning Tree, Storm control.

IP811-maritme (PBX)
May be powered from two individual PoE switches

IP29-8-maritme (analog stations)
Powered by PoE switch

Plan, Install, Secure, and Operate your core active component according to:
-DNV-RU-SHIP Pt.6 Ch.3. Edition July 2023

See network drawing, Figure *1*
Checklist reference: 1.1, 1.2, 1.4, 1.5

Appliances outside scope of TA:
See table in chapter 2.2.1 and chapter 2.2.2

5.3 Endpoints - Stations

Chapter 6.10.1.1 Priority Calls, Intrusion
Chapter 6.10.1.3 Noisy environment
Chapter 4.2.10.3 Mooring operations, Intercom

This chapter lists stations that must be included and comply to the requirements within this TA and must be followed.
It also lists some optional equipment which may only be installed in locations where mandatory communication is not required by IMO or class rules.
See detailed feature list in chapter 2.2.3

5.3.1 Bridge – Main station, Bridge wing's

Stations included of critical communication and covered by the requirements of TA

- SC411 (or IP170*)
  Mounted at desired location along with selected accessories.
  * IP170 is expected to be available during 2025
- IP111-maritime
  Mandatory with additional device if selected station doesn't support announcement or intrusions features. In case of duo installation both phones will have same number and act as one, with the option to do outbound call from both phones at the same time.
  Additional advantage is a better overview and quick selection/speed dials (IP111)
  Tip is to place IP111-maritime at chart table.

Checklist reference: 1.3, 4.2, 4.3, 8.1

5.3.2 ECR (Engine Control Room)

Stations included of critical communication and covered by the requirements of TA

- SC411 (or IP170*)
  Mounted at desired location along with selected accessories.
  * IP170 is expected to be available during 2025
- IP111-maritime
  Mandatory with additional device if selected station doesn't support announcement or intrusions features. In case of duo installation both phones will have same number and act as one with the option to do outbound call from both phones at the same time.
  Additional advantage is a better overview and quick selection/speed dials (IP111)

Checklist reference: 1.3, 4.2, 4.3, 8.1

5.3.3 Engine Room (noisy area)

Stations included of critical communication and covered by the requirements of TA

- SC421 (or IP171*)
  Mounted at desired location along with required accessories.
  * IP171 is expected to be available during 2025
  ! Note, SC421 support no mixed announcement feature (only auto answer mode)

Checklist reference: 1.3, 7.3

Optional station which may only be installed in locations where mandatory communication is not required by IMO or class rules.

- IP160 (or IP17x*)
  Mounted at desired location along with required accessories.
  Supporting mixed announcements as direct in and zone paging, headset, flashing keypad, speed dial, relay, etc.
  * IP17x is expected to be available during 2025
  ! Note, IP160 supports no hands-free, nor headset PTT

5.3.4 Deck area

Stations included of critical communication and covered by the requirements of TA

- SC421 (or IP17x*)
  Mounted at desired location along with required accessories.
  * IP17x is expected to be available during 2025
  ! Note, SC421 support no mixed announcement feature (only auto answer mode)

Checklist reference: 1.3, 7.2

Optional stations which may only be installed in locations where mandatory communication is not required by IMO or class rules.

- IP160 (or IP17x*)
  Mounted at desired location along with required accessories.
  Supporting mixed announcements as direct in and zone paging, headset, flashing keypad, speed dial, relay, etc.
  * IP17x is expected to be available during 2025
  ! Note, IP160 supports no hands-free, nor headset PTT

5.3.5 Accommodation

Stations included of critical communication and covered by the requirements of TA

- IP111-maritime
  Supporting: Hands-free, Speed-dial, Wakeup, voicemail, DnD, Announcements zones, etc.

Checklist reference: 1.3, 7.2, 9.1, 9,3 9,4

Optional stations which may only be installed in locations where mandatory communication is not required by IMO or class rules.

- Any IP 1xx/2xx station, see *chapter 2.2.3*
  Supporting: Hands-free, Speed-dial, Wakeup, Voicemail, DnD, Announcements zones, etc.

5.4 Software installation

Chapter 4.2.10.1, 6.10.1.1, 6.10.1.2 Two-way voice communication system
Chapter 6.10.1.1 Minimum 4 simultaneous calls
Chapter 6.10.1.2 Redundancy

Install and commissioning the innovaphone platform in accordance with the Master/Standby concept according to site documentation, sample data can be found in *chapter 4.2*

Master:
Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Course13:IT_Advanced_2_-_05_Master/Slave_Operation

Standby:
Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Howto13r3:Step-by-Step_Setting_up_a_Standby_PBX

Platform replication: (myApps)
Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference14r1:Concept_App_Platform#Replication:~:text=the%20AP%20Manager.-,Replication,-%5Bedit%20source
Checklist reference: 1.6, 2.0-8

5.5 Optional LAN settings

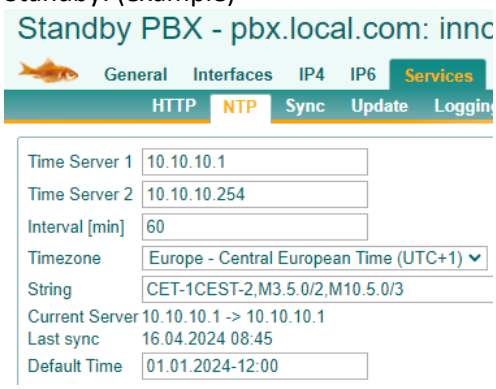
In order to complete the basic network setups some adjustments need to be done.

5.5.1 NTP

Set NTP credential according to needs. Best practice and recommended is to combine external NTP server (e.g. master clock, or other NTP source) with local manually default time as fallback.

Master: (example)

Standby: (example)



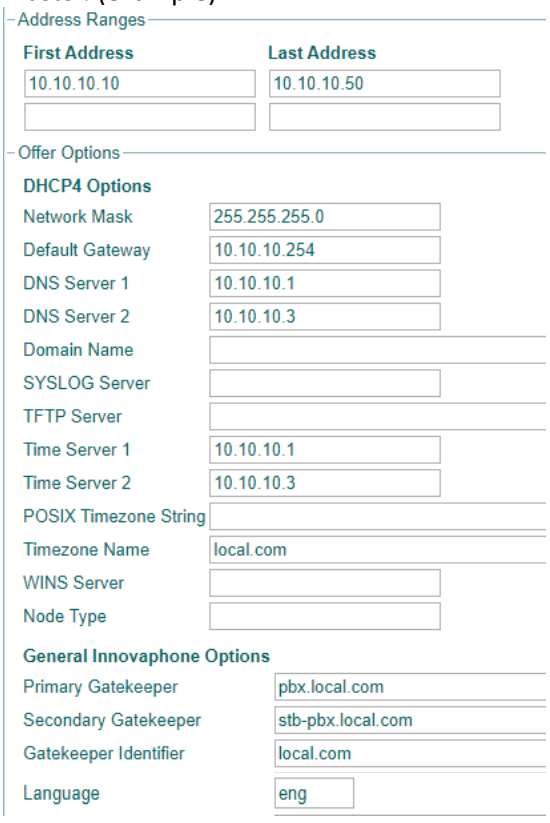
Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference13r1:Services/NTP
https://wiki.innovaphone.com/index.php?title=Howto:Setting_time_and_date_without_using_an_NTP
Checklist reference: 3.2

5.5.2 DHCP server

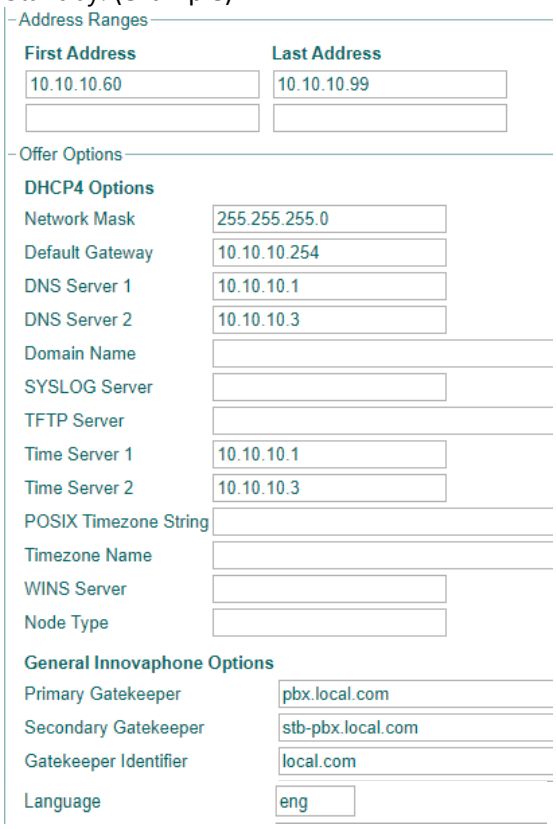
Set all needed DHCP credentials according to site documentation, (*examples in chapter 4.2*) plus additional site unique settings like language, etc.

Enter same settings in both Master and Standby except for DHCP pool range, (must be unique)

Master: (example)



Standby: (example)



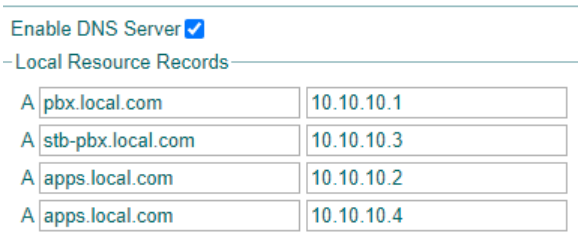
Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference12r2:IP4/ETH/Server
Checklist reference: 3.2

5.5.3 DNS

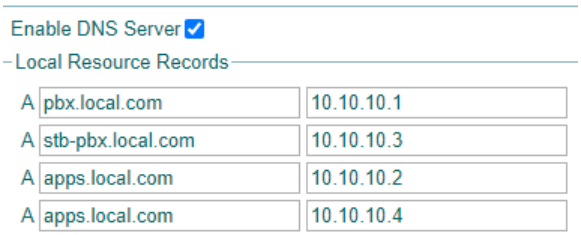
As part of the redundancy concept, it´s recommended to use DNS lookups for the identification and registration mechanism.

Activate DNS server according to site documentation, (*examples in chapter 4.2*)

Master: (example)



Standby: (example)



Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference9:Services/DNS/Hosts
Checklist reference: 3.3

5.5.4 Dual Ethernet power

Chapter 6.10.1.1 Central Power backup
Chapter 6.10.1.2 Redundancy

In cases where 2 Ethernet (POE) power sources are required to support seamless power failover, RSTP (Spanning Tree) must be enabled in both ends (switch and PBX, e.g. IP811)

Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference9:Interfaces/ETH/RSTP
Find corresponding settings specified by the switch manufacturer.
Checklist reference: 1.4

5.6 System settings

This section describes features configuration, best praxis, usage, and other mandatory requirements to meet TA

5.6.1 DTMF features

Chapter 4.2.10.2 - 3.3.3 - 6.10.1.1

By defining a DTMF Object “Announcement” feature prefix we create conditions to support:
-Direct In - Singel Paging - Call intrusion - DnD override

In this TA ## is the feature prefix according to documentation.

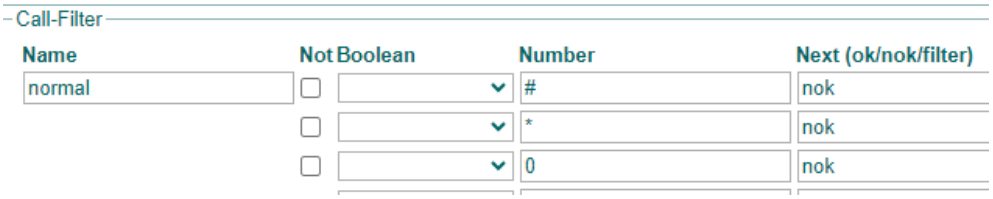
Note, by calling with this feature prefix all innovaphone devices will default answer in HF mode with microphone off for security reasons.
-During call enable full duplex by pressing microphone button once (toggle on/off) or lift handset.

Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Course10:Basic_-_PBX_-_Advanced_Object_Properties_and_Behaviour#Calling_the_Partner_and_Intrusion:~:text=initiate%20the%20call.-,Announcement,-Calls
Checklist reference: 8.1, 9.1

5.6.2 Call filter

Useful to limit the ability to call specific numbers or execute feature functions.
Note, same parameters must be set on both Master and Standby platform

In this TA at least 2 call filter is needed.
Example: “normal”, blocks numbers/codes starting with #, *, 0 (0=landline)



Example: “FullAccess” no blocks at all

Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference9:PBX/Config/Filter
Checklist reference: 5.1

5.6.3 Config Templates

Config templates is an efficient and powerful way to distribute same parameters to group of users.
In this TA we use several templates for different roles and features.

Long Name	Name «	No «	HW-ID «	Node «	PBX «	Filter «	Groups «	CF* «	Fork «	Config «	Phone «	Profile «	Visibility «	Rights «	Type «
Config Admin						normal				Config User	+		+		Config Template
Config Bridge						FullAccess				Config User	config		@local.com		Config Template
Config BridgeWing						FullAccess				Config User	config		+		Config Template
Config CrewCab						normal				Config User	config		+		Config Template
Config ECR						normal				Config User	config		@local.com		Config Template
Config EngineRoom						normal				Config User	config		+		Config Template
Config OfficersCab						FullAccess				Config User	config		+		Config Template
Config User						normal					config		@local.com		Config Template

The default "Config User" is used as base for all other templates (roles).
Other templates (roles) incorporate "Config User", and add/overwrite with own unique settings.

Examples used in TA

Config User — Set: Default language, , Call filter “normal” according to default resections.

Config Bridge — Set: Inherit Config User, Enable call intrusion tick box,
Add Visibility “Calls” tick box and Name field = @local.com (PBX Dns name)
Enable call filter “FullAccess”
Set individual settings such Function keys, Ringtones, etc

Config ECR — Set: Inherit Config User, Enable call intrusion tick box,
Add Visibility “Calls” tick box and Name field = @local.com (PBX Dns name)
Enable call filter “FullAccess”
Set individual settings such Function keys, Ringtones, etc

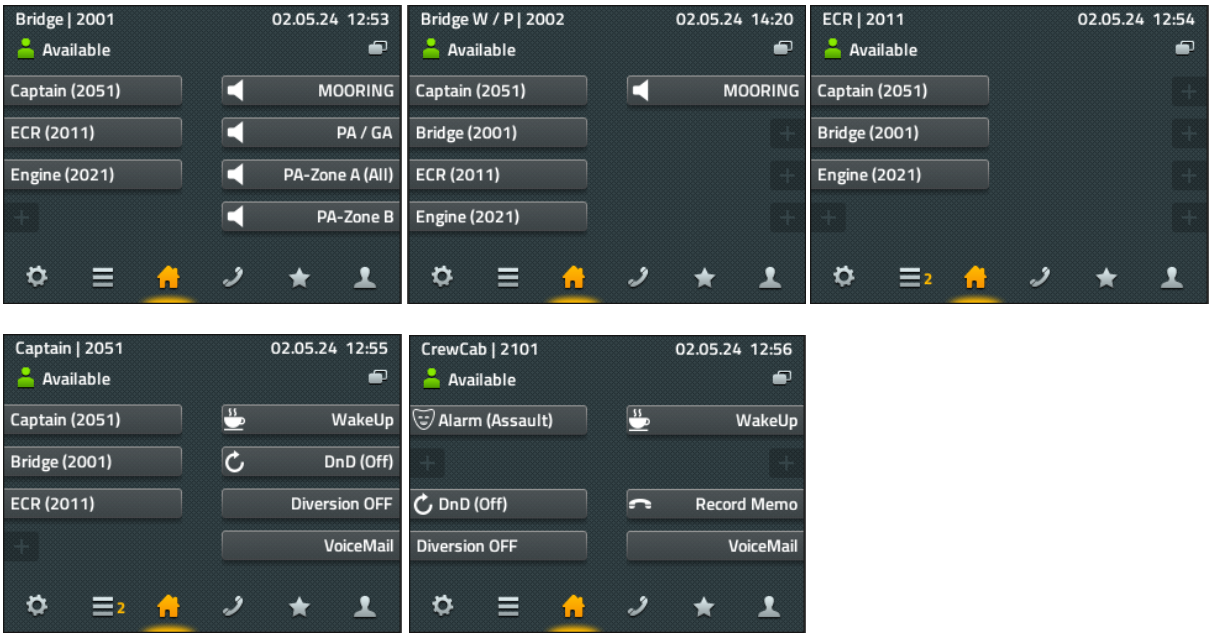
Etc. — Create additional templates according to your needs....

Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference13r1:PBX/Objects/Config_Template
Checklist reference: 6.1

5.6.4 Function keys

As a part of config templates, it is very advisable to also add applicable function keys.
It saves a lot of time and will be the success of a user-friendly and easy-to-use system.

Example: (only applicable for IP1xx / IP2xx units)



Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference9:Phone/User/Function-Keys

5.6.5 Ring filter

Chapter 6.10.1.1 Distinguish ring signals

In cases where same phone model is placed close to each other it is desirable to distinguish with different ring signals.
Ither set the ring melody locally at phone´s or within a Config template.

Detailed reference link:
http://wiki.innovaphone.com/index.php?title=Reference12r1:Phone/User/Preferences#:~:text=Announcement%20Call.-,Ring%20filter,-Up%20to%20five
Checklist reference: 4.2

5.6.6 Handsfree operation

Chapter 6.10.1.7

Most stations support multiple call setup as handsfree, handset or headset by dialling the number followed by desired action, e.g. speaker button for HF (hands-free) call.
Find the most suitable model/station in *chapter 2.2.3*
Checklist reference: 5.2

5.6.7 Call intrusion – Priority call

Chapter 6.10.1.1

Mandatory Between Bridge – ECR.

If the instructions and settings according to chapters 5.6.1 - 5.6.3 are met there are a few ways to achieve intrusion to a busy station from trusted user.

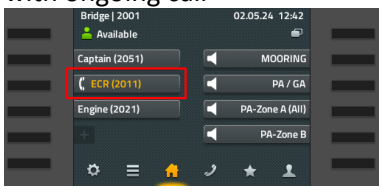
Applicable from any station

Calls to any busy station from trusted user with initial prefix ## (in this TA) will perform intrusion and third-party user will be disconnected.

! Note, (only applies for IP1xx / IP2xx)
In case of HF intrusion to other then bridge or ECR, half duplex applies for security reasons unless it's set otherwise. If intrusion is performed during a handset or headset call full duplex applies.

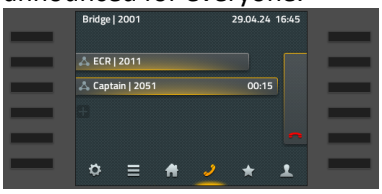
Applicable only from IP11x / IP2xx

Function key is flagged as busy with ongoing call



Press function key regardless for call intrusion

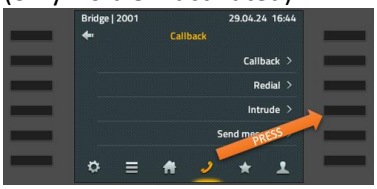
Call connects, intrusion ton is announced for everyone.



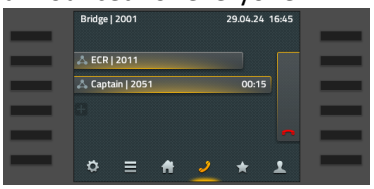
Usage of Function key.

In Busy state press **C** button

Followed by intrude button (only visible if activated)



Call connects, intrusion ton is announced for everyone.



Calling by number to any extension from trusted user

Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Course12:Basic_-_PBX_-_Advanced_Object_Properties_and_Behaviour#Calling_the_Partner_and_Intrusionr_and_Intrusion
Checklist reference: 8.1

5.6.8 Command call, Talk-back

Chapter 4.2.10.3 Mooring operations, Intercom
Alternatively, a separate UHF radio can be used

Very common is the need of a voice command utility in some kind of loudspeaker environment with the possibility of talkback, especially useful in mooring situations, but also for other reasons.

In order to fully meet the requirement for command call to multiple units, the support of PBX conference bridge is required, ither by built in support as IP811 (10 channels) or as software channel licenses.

In this case:
BC object: nr #100, Conf-device CONF/Dynamic id, Mode First, Disconnect last, Call always announce. Group active.

Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference9:PBX/Objects/Call_Broadcast_Conference
Checklist reference: 8.x

5.6.9 Night vision

Chapter 5.5.4.3

Applicable to bridge.

Ensure selected devices UIDs is dimmable and does not interfere night vision. Set brightness either manual or auto.
Auto and keypad dimming is not applicable to IP10x, IP11x, IP2xx

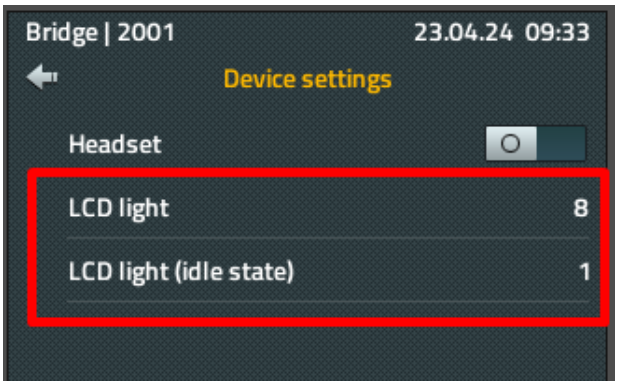
There are two methods to set “display” level manually at IP11X, IP2XX.

Manually from phone:
Settings/Phone settings/ Device settings

Command line: (remote)
vars create PHONE/LCD-BACKLIGHT p 8
(default 8, option 1-15)

Vars create PHONE/LCD-IDLE-BACKLIGHT p 2
(default 2, option 0-15)

(p = strength)



Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference13r1:Maintenance/Diagnostics/Command
Checklist reference: 4.3

5.6.10 Extension list

 Chapter 6.10.1.4

A reference list of extensions shall be permanently posted near each telephone being readable while dialing.
Checklist reference: 4.1

5.6.11 Paging

Paging, is mainly about get in contact and make yourself heard to a person or groups of people and is needed for many reasons, and goes in many different flavors and combinations.
-Singel paging, Zone paging, by voice or text, even in a nice mix with PA/GA

This section will cover voice paging to comply with TA and to meet common needs.

5.6.11.1 Singel Paging

 Chapter 4.2.10.2 - 3.3.3 (default half duplex)

This simply means voice summon to single unit, e.g., cabin phone or loudspeaker.
Also refers to Direct-in.
-This is already configured according to chapter 5.6.1 according to DTMF announce prefix ##

Call from trusted user to any station with initial prefix + number, e.g ##2011 will put destination in speaker announce mode.
Checklist reference: 9.1

5.6.11.2 PA/GA paging

Not a TA requirement in this context, but really nice to have and commonly used.
There are many protocols and interfaces for transition to PA/GA systems, such as SIP, Analog and ISDN, which are supported within the framework of innovaphone products.

Still common and often used is so-called IP-Audio-Converter-module due to PA, PA/GA design.
In TA we used TKIS-2 as third-party device to convert IP to Audio media upon a call based on a normal SIP PBX registration. Consult respective supplier for specific settings.
Checklist reference: 9.2

5.6.11.3 Zone paging

Chapter 4.2.10.2 - 3.3.3 (Half duplex)

A mix of endpoints (speakers) can be included and form one or more zones for lager summon needs.

Examples used in TA
Create MCast objects (multicast) according to site documentation.

Paging Zone A (All)
Paging Zone B (X)
Etc...

As for third-party sip device set the corresponding multicast address and port number depending on which announcement zones it should listen to.

Detailed reference links:
https://wiki.innovaphone.com/index.php?title=Course10:Advanced_-_MCast_Announce_Object
https://wiki.innovaphone.com/index.php?title=Reference9:PBX/Objects/MCast_Announce
Checklist reference: 9.3, 9,4

5.7 More System Features

This section lists commonly used features that are beyond TA requirements but gives the system an extra level of functionality.

5.7.1 DISA

A very common, cost-effective and old proven method of reaching all extensions from a single number from the outside (landline) is a so-called DISA feature. Combined with a simple IVR makes the function even more complete.

This is easily solved with a so-called WQ object and a pre-recorded welcome message
“Welcome to m/s XX enter desired extension or hold and your call will be transferred….”

Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference12r1:PBX/Objects/Waiting_Queue

5.7.2 Conference Calls / Rooms

Similar to other “group-calls” covered in this guide this chapter refer to a more classic call-in conference feature.

Due to the choice of stations only "voice" conferences normally are required, but also video conferences are supported by adding licenses.

Detailed reference link:
https://www.innovaphone.com/en/products/software/conferencing.html

5.7.3 Wake Up

There are different variants of wakeup features depending on needs.

Detailed reference links:
https://wiki.innovaphone.com/index.php?title=Howto:Simple_Wake-UP_Service
https://wiki.innovaphone.com/index.php?title=Howto:Wakemeup_-_Mediterranean_Consulting_-_Partner_App

5.7.4 DnD (Do Not Disturb)

May be used on each individual extension, preferably cabins.
Trusted user can override this feature.

Detailed reference link:
https://wiki.innovaphone.com/index.php?title=Reference9:Phone/User/Function-Keys/Do-Not-Disturb

5.7.5 Emergency group call

A common requested feature is to auto call a group of selected persons upon an emergency situation like fire or similar, often triggered by a relay.

There are different solutions available, but basically a BC conference object is used as a base.

Detailed reference links:
https://wiki.innovaphone.com/index.php?title=Reference9:PBX/Objects/Call_Broadcast_Conference

6 Testing and reports

6.1 Checklist

To have a fully compliant approved system according to TA 848,25 requirements to the following checklist need to comply.

Ref	Feature	Test procedure	Test result OK/NOK/NA
1.0	**Infrastructure:**		
1.1	Is all central hardware placed and secured according to requirements?		
1.2	Is correct cabling in use?		
1.3	Right stations on right place? Noisy environment, Bridge, ECR, Cabins etc.		
1.4	Dual power sources when required?		
1.5	Own individual infrastructure (LAN)? (preferably separated by IEEE 802.1Q vlan tagging)		
1.6	Is all site and other documentation in place?		

2.0	**Local Cyber Security access**	**Test procedure**	**Test result OK/NOK/NA**
2.1	Login account: Master password for system "admin" user	Check system login to PBX GUI with admin credentials according to site documentation.	
2.3	Login account: PBX myApps admin login	Check myApps login with admin username and password according to site documentation.	
2.4	Separated infrastructure: (In case of IEEE 802.1Q VLAN tagging)	Connect a PC behind a phone with VLAN tag. Try to browse the PBX No access should be possible.	
2.5	Master PBX access	Check web access to IP ETH0 on master PBX. Web GUI should be accessible.	
2.6	Master App platform access	Check web access to IP ETH2 on master AP. Web GUI should be accessible.	
2.7	Standby PBX, Back-up telephone system access (not applicable if standby PBX is not installed)	Check web access to IP ETH0 standby PBX. Web GUI should be accessible.	
2.8	Standby PBX, Back-up telephone system (not applicable if standby PBX is not installed)	Disconnect Master and check new registration on Standby for all phones during 2-3 minutes after DHCP, NTP and DNS service is up again.	
2.9	Station access Device registration (only applicable to innovaphone devices)	Check and verify that default credential is changed, documented and unwanted access is blocked in free open LAN ports.	

3.0	**Network Features**	**Test procedure**	**Test result OK/NOK/NA**
3.1	*DHCP server:* (not applicable if external DHCP server) innovaphone PBX act as a DHCP server for all type of devices	Connect a PC with DHCP client in LAN, shall get IP settings	
3.2	*Timer server:* (NTP) (not applicable if PBX is set up with external NTP server) Innovaphone PBX act as NTP server	Disconnect Internet access, recycle power on a phone, verify that time is displayed in phone.	
3.3	*DNS server:* (not applicable if external DNS server) Innovaphone PBX act as DNS server	Connect a PC with DHCP client in LAN, shall get all IP setting, browse “DNS” name according to site documentation.	

4.0	**Special Features**	**Test procedure**	**Test result OK/NOK/NA**
4.1	Extension list	Verify there is a reference list of extensions posted near each telephone being readable while dialing.	
4.2	*Distinguish ringing melody:* Different ringing melody on phones (Only applicable if different phones are located near each other)	Set up two calls to two phones configured with different ringing melody. Verify different ring signals.	
4.3	*Dimmable phone backlight* Only applicable on bridge. If not auto adjusting manually	Verify that illumination is properly adjusted.	

5.0	**Call filter**	**Test procedure**	**Test result OK/NOK/NA**
5.1	Blocking # prefix used for feature functionality.	Set up a call from any untrusted phone with a leading #, e.g. ##2001 for direct in. Check the call is blocked.	
5.2	Handsfree announcement call allowed	Set up a call from Bridge or other phone with announcement rights. Verify that test phone automatically goes in handsfree mode.	

6.0	**Config Template**	**Test procedure**	**Test result OK/NOK/NA**
6.1	Default language	Check menu language on a phone. Is it OK?	
6.2	Handsfree announcement call allowed	Set up a call from Bridge or other phone with announcement rights. Verify that test phone automatically goes in handsfree mode	

7.0	**Call Features (2-way communication)**	**Test procedure**	**Test result OK/NOK/NA**
7.1	*Minimum 4 simultaneous calls* Note: PBX does not include any limits in number of simultaneous VoIP calls.	Simultaneous calls from minimum four phones to other phones or to ex DISA (or other non-blocking queue message). Verify media and call completion.	
7.2	*Direct call* Repeat at least in 4 places/numbers	Call from any phone to any number according to site documentation. Verify phone ringing. Answer to verify media. Hang-up, Verify call completion.	
7.3	*Direct call noisy environment* Ex, Engine room with headset sounder beacon, etc	Call from any phone to any number according to site documentation. Verify phone ringing, Sounder ringing or flashing. Answer to verify media in handsfree, handset or headset. Hang-up, Verify call completion.	
7.4	*Group calls:* Ex, All Bridge and/or ECR phones	Call from any phone to Bridge group nr according to site documentation Verify that all phones ringing. Answer to verify media. Hang-up, Verify call completion.	

8.0	**Special Call Features**	**Test procedure**	**Test result OK/NOK/NA**
8.1	*Call intrusion (Priority calls), DnD override:* Mandatory between Bridge-ECR-Bridge	Call a "busy" station from Bridge or other trusted station with any “intrusion” option depending on station Ex, Partner key or call flow handling from IP111 or intrusion prefix + number from any station according to site documentation Verify calls breaks in, call is put on hold and media is established.	
8.2	*Command call (e.g. mooring situations)* Alternatively, a separate portable radio system can be used	Call from any trusted station (e.g. Bridge wing) to the mooring group, ither via number or speed dial key. Verify all stations auto-answer, Verify media. Hang-up, Verify call completion.	

9.0	**Paging (Voice)**	**Test procedure**	**Test result OK/NOK/NA**
9.1	*Direct In, DnD override, (default half duplex)* (Applies only to IP stations)	Call any "free" station from any station with rights to use the "paging prefix" according to site documentation. (Prefix + Extnr) Verify phone ringing's once, goes of hook in hands-free mode, Verify media, Hang-up, Verify call completion.	
9.2	*PA/GA (Half duplex)* Interface to PA/GA system via PA module. (not applicable if no PA/GA integration)	Call to "PA Module" from any station with rights to use the "PA Module prefix" according to site documentation. Verify audio in PA/GA. Verified that call to PA/GA is only possible from trusted stations, others are blocked. Verify call completion.	
9.3	*IP multicast (Half duplex)* (Applies to IP stations/IP speakers, analogue stations require auto answer)	Call to any Zone "Prefix" from any station with rights to use desired zone "Prefix" according to site documentation. Verify audio in IP stations/speakers Verified that call to "Zones" is only possible from trusted stations, others are blocked. Verify call completion.	
9.4	Mixed Zones IP + PA/GA (All) *(Half duplex)* (not applicable if no PA/GA integration)	Call to All zone "Prefix" from any station with rights to use desired zone "Prefix" according to site documentation. Verify audio in ALL stations/speakers Verified that call to "Zones" is only possible from trusted stations, others are blocked. Verify call completion.	

	Deviations:	**Test procedure**	**Test result OK/NOK/NA**
	Is the system fully intact and commissioned according to TA XXXX		
	List the product:		
		Did the replacement product meet the set requirements?	
		Did the replacement product meet the set requirements?	
		Did the replacement product meet the set requirements?	
		Did the replacement product meet the set requirements?	

Company Name:		Signature and date:
Full name:		
Position:		

Company Name:		Signature and date:
Full name:		
Position:		

Company Name:		Signature and date:
Full name:		
Position:		