Te Kaunihera o Te Hiku o te Ika
Far North District Council

Office Use Only
Application Number:

# Application for resource consent or fast-track resource consent

(Or Associated Consent Pursuant to the Resource Management Act 1991 (RMA)) (If applying for a Resource Consent pursuant to Section 87AAC or 88 of the RMA, this form can be used to satisfy the requirements of Form 9). Prior to, and during, completion of this application form, please refer to Resource Consent Guidance Notes and Schedule of Fees and Charges — both available on the Council's web page.

## 1. Pre-Lodgement Meeting

Have you met with a council Resource Consent representative to discuss this application prior to lodgement?

◯ **Yes** ✔ **No**

If yes, who have you spoken with?

## 2. Type of consent being applied for

***(more than one circle can be ticked):***

✔ **Land Use**
◯ **Fast Track Land Use***
◯ **Subdivision**
◯ **Consent under National Environmental Standard**
(e.g. Assessing and Managing Contaminants in Soil)
◯ **Other (please specify)**

◯ **Discharge**
◯ **Change of Consent Notice (s.221(3))**
◯ **Extension of time (s.125)**

**The fast track is for simple land use consents and is restricted to consents with a controlled activity status.*

## 3. Would you like to opt out of the fast track process?

✔ **Yes** ◯ **No**

## 4. Consultation

Have you consulted with Iwi/Hapū? ✔ **Yes** ◯ **No**

If yes, which groups have you consulted with? Representatives of Te Tii Marae

Who else have you consulted with? Far North District Council, Waka Kotahi New Zealand Transport Agency

*For any questions or information regarding iwi/hapū consultation, please contact Te Hono at Far North District Council, **tehonosupport@fndc.govt.nz***

## 5. Applicant details

**Name/s:** Northland Regional Council

**Email:** [redacted]

**Phone number:**

**Postal address:**
(or alternative method of service under section 352 of the act)

Have you been the subject of abatement notices, enforcement orders, infringement notices and/or convictions under the Resource Management Act 1991? ◯ **Yes** ✔ **No**

If yes, please provide details.

## 6. Address for correspondence

***Name and address for service and correspondence (if using an Agent write their details here)***

**Name/s:** Laura Bowman

**Email:** [redacted]

**Phone number:**

**Postal address:**
(or alternative method of service under section 352 of the act)

All correspondence will be sent by email in the first instance. Please advise us if you would prefer an alternative means of communication.

## 7. Details of property owner/s and occupier/s

***Name and Address of the owner/occupiers of the land to which this application relates (where there are multiple owners or occupiers please list on a separate sheet if required)***

**Name/s:** Far North District Council

Property address/
location: Private Bag 752, Kaikohe

Postcode 0440

## 8. Application site details

*Location and/or property street address of the proposed activity:*

**Name/s:** Far North District Council - Road Authority

**Site address/ location:** Road Reserve - See Appendix 1 for details

Postcode

**Legal description:** Parcel ID: 5238333 **Val Number:**

**Certificate of title:** Road Reserve - See Appendix 1 for details

Please remember to attach a copy of your Certificate of Title to the application, along with relevant consent notices and/or easements and encumbrances (search copy must be less than 6 months old)

**Site visit requirements:**

Is there a locked gate or security system restricting access by Council staff? ◯ **Yes** ✔ **No**

Is there a dog on the property? ◯ **Yes** ✔ **No**

Please provide details of any other entry restrictions that Council staff should be aware of, e.g. health and safety, caretaker's details. This is important to avoid a wasted trip and having to re-arrange a second visit.

## 9. Description of the proposal

Please enter a brief description of the proposal here. Please refer to Chapter 4 of the *District Plan, and Guidance Notes*, for further details of information requirements.

To construct and install a tsunami siren in the Commercial Zone (Sub-Zone A2).

The project seeks to build resilience and support Te Taitokerau Northland's civil defence and emergency management response against tsunami risk.

If this is an application for a Change or Cancellation of Consent Notice conditions (s.221(3)), please quote relevant existing Resource Consents and Consent Notice identifiers and provide details of the change(s), with reasons for requesting them.

## 10. Would you like to request public notification?

◯ **Yes** ✔ **No**

## 11. Other consent required/being applied for under different legislation

*(more than one circle can be ticked):*

◯ **Building Consent** Enter BC ref # here (if known)

◯ **Regional Council Consent (ref # if known)** Ref # here (if known)

◯ **National Environmental Standard Consent** Consent here (if known)

◯ **Other (please specify)** Specify 'other' here

## 12. National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health:

The site and proposal may be subject to the above NES. In order to determine whether regard needs to be had to the NES please answer the following:

Is the piece of land currently being used or has it historically ever been used for an activity or industry on the Hazardous Industries and Activities List (HAIL)? ◯ **Yes** ✔ **No** ◯ **Don't know**

Is the proposed activity an activity covered by the NES? Please tick if any of the following apply to your proposal, as the NESCS may apply as a result? ◯ **Yes** ✔ **No** ◯ **Don't know**

◯ **Subdividing land**

◯ **Changing the use of a piece of land**

◯ **Disturbing, removing or sampling soil**

◯ **Removing or replacing a fuel storage system**

## 13. Assessment of environmental effects:

*Every application for resource consent must be accompanied by an Assessment of Environmental Effects (AEE). This is a requirement of Schedule 4 of the Resource Management Act 1991 and an application can be rejected if an adequate AEE is not provided. The information in an AEE must be specified in sufficient detail to satisfy the purpose for which it is required. Your AEE may include additional information such as written approvals from adjoining property owners, or affected parties.*

**Your AEE is attached to this application** ✔ **Yes**

## 14. Draft conditions:

Do you wish to see the draft conditions prior to the release of the resource consent decision? ✔ **Yes** ◯ **No**

If yes, please be advised that the timeframe will be suspended for 5 working days as per s107G of the RMA to enable consideration for the draft conditions.

## 15. Billing Details:

This identifies the person or entity that will be responsible for paying any invoices or receiving any refunds associated with processing this resource consent. Please also refer to Council's Fees and Charges Schedule.

| | |
|---|---|
| **Name/s:** (please write in full) | Northland Regional Council (C/O-Brendon Gray) |
| **Email:** | [redacted] |
| **Phone number:** | |
| **Postal address:** (or alternative method of service under section 352 of the act) | |

**Fees Information**

An instalment fee for processing this application is payable at the time of lodgement and must accompany your application in order for it to be lodged. Please note that if the instalment fee is insufficient to cover the actual and reasonable costs of work undertaken to process the application you will be required to pay any additional costs. Invoiced amounts are payable by the 20th of the month following invoice date. You may also be required to make additional payments if your application requires notification.

## *15. Billing details* continued...

**Declaration concerning Payment of Fees**

I/we understand that the Council may charge me/us for all costs actually and reasonably incurred in processing this application. Subject to my/our rights under Sections 357B and 358 of the RMA, to object to any costs, I/we undertake to pay all and future processing costs incurred by the Council. Without limiting the Far North District Council's legal rights if any steps (including the use of debt collection agencies) are necessary to recover unpaid processing costs I/we agree to pay all costs of recovering those processing costs. If this application is made on behalf of a trust (private or family), a society (incorporated or unincorporated) or a company in signing this application I/we are binding the trust, society or company to pay all the above costs and guaranteeing to pay all the above costs in my/our personal capacity.

**Name:** (please write in full) Brendon Gray

**Signature:** [redacted] Date 23-Feb-2026

(signature of bill payer) **MANDATORY**

## 16. Important Information:

**Note to applicant**

You must include all information required by this form. The information must be specified in sufficient detail to satisfy the purpose for which it is required.

You may apply for 2 or more resource consents that are needed for the same activity on the same form.

You must pay the charge payable to the consent authority for the resource consent application under the Resource Management Act 1991.

**Fast-track application**

Under the fast-track resource consent process, notice of the decision must be given within 10 working days after the date the application was first lodged with the authority, unless the applicant opts out of that process at the time of lodgement.

A fast-track application may cease to be a fast-track application under section 87AAC(2) of the RMA.

**Privacy Information:**

Once this application is lodged with the Council it becomes public information. Please advise Council if there is sensitive information in the proposal. The information you have provided on this form is required so that your application for consent pursuant to the Resource Management Act 1991 can be processed under that Act. The information will be stored on a public register and held by the Far North District Council. The details of your application may also be made available to the public on the Council's website, www.fndc.govt.nz. These details are collected to inform the general public and community groups about all consents which have been issued through the Far North District Council.

## 17. Declaration

The information I have supplied with this application is true and complete to the best of my knowledge.

**Name** (please write in full) Laura Bowman

**Signature** Date 04-Feb-2026

***A signature is not required if the application is made by electronic means***

*See overleaf for a checklist of your information...*

## Checklist

***Please tick if information is provided***

- [x] Payment (cheques payable to Far North District Council)
- [x] A current Certificate of Title (Search Copy not more than 6 months old)
- [x] Details of your consultation with Iwi and hapū
- [ ] Copies of any listed encumbrances, easements and/or consent notices relevant to the application
- [x] Applicant / Agent / Property Owner / Bill Payer details provided
- [x] Location of property and description of proposal
- [x] Assessment of Environmental Effects
- [x] Written Approvals / correspondence from consulted parties
- [x] Reports from technical experts (if required)
- [x] Copies of other relevant consents associated with this application
- [x] Location and Site plans (land use) AND/OR
- [ ] Location and Scheme Plan (subdivision)
- [x] Elevations / Floor plans
- [ ] Topographical / contour plans

Please refer to Chapter 4 of the District Plan for details of the information that must be provided with an application. Please also refer to the RC Checklist available on the Council's website. This contains more helpful hints as to what information needs to be shown on plans.

# Northland Tsunami Siren Rollout

## Stage 3 – Land Use Consent (Siren 67)

Te Karuwha Road, Paihia

Assessment of Environmental Effects and Statutory Analysis

23 February 2026

B&A
Urban & Environmental

Prepared for:
Northland Regional Council

B&A Reference:

25782

Status:

Final Version

Date:

23 February 2026

Prepared by:

Te Karira Ruakere-Norris

Planner, Barker & Associates Limited

Reviewed by:

David Badham

Partner/Northland Manager, Barker & Associates Limited

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# 1.0 Applicant and Property Details

| | |
|---|---|
| To: | Far North District Council (FNDC) |
| Site Address: | Te Karuwha Road Roundabout Roadside Reserve (Parcel ID: 5238333) |
| Applicant Name: | Northland Regional Council |
| Address for Service: | Barker & Associates Ltd<br>Level 1, 136 Bank Street<br>Whangārei 0112<br>Attention: Laura Bowman |
| Legal Description: | Parcel ID: 5238333 (refer to Record of Title as **Appendix 1**) |
| Site Area: | 3791 $m^2$ |
| Site Owner: | Far North District Council |
| District Plan: | Operative Far North District Plan (**ODP**)<br>Proposed Far North District Plan (**PDP**) |
| Zoning: | **ODP**: Commercial Zone (Sub-Zone A2)<br>**PDP**: Mixed Use |
| Precinct: | **ODP:** None<br>**PDP:** None |
| Overlays & Controls: | **ODP:** None<br>**PDP:** Coastal Environment Overlay, Coastal Erosion (Zone 1:50 Year Scenario), Coastal Flood (Zone 1:50 Year Scenario), Coastal Flood (Zone 2: 100 Year Scenario), Coastal Flood (Zone 3: 100 Year + Rapid Sea Level Rise Scenario), River Flood Hazard Zone (10 Year ARI Event) and River Flood Hazard Zone (100 Year ARI Event). |
| Designations: | **ODP**: NZTA3 (Waka Kotahi – New Zealand Transport Agency)<br>**PDP**: NZTA3 (Waka Kotahi – New Zealand Transport Agency) |
| Additional Limitations: | Nil |
| Locality Diagram: | Refer to **Figure 1** |

| | |
|---|---|
| Brief Description of Proposal: | To construct and install a tsunami siren, including site preparation works and connection to power and telecommunication services in the Commercial Zone – Road Reserve. The project seeks to build resilience and support Te Taitokerau Northland's civil defence and emergency management response against tsunami risk. |
| Summary of Reasons for Consent: | ODP: Restricted discretionary consent is required pursuant to Rule 7.7.5.3.6 Noise. |

# 2.0 Background

Northland Regional Council (**NRC**) is coordinating the rollout of new tsunami sirens across Te Taitokerau Northland. Barker & Associates (**B&A**) have been engaged to prepare and submit the resource consent application on behalf of NRC.

NRC is coordinating the siren roll out on behalf of all three-district councils within Te Taitokerau Northland. This project has been discussed in depth at Te Taitokerau's Civil Defence and Emergency Management Working Group (**CDEM**) and is fully supported by all iwi representatives, Council's CEO's and Mayors.

Currently, there are a number of sirens located throughout Te Taitokerau that do not meet the National Emergency Management Agency (**NEMA**) standards, the sirens do not meet frequency or messaging requirements of the standard and as such need replacing. 95 new sirens have been proposed to replace the old sirens across Te Taitokerau which all have better coverage and will meet NEMA standards, the process of installing these is already underway.

This proposal seeks to establish one new tsunami siren at the Te Karuwha Road Roundabout Roadside Reserve just south of Te Tii Marae, Waitangi. The siren infrastructure is part of CDEM's toolbox for managing the risk of tsunami across Te Taitokerau Northland. Details of pre-lodgement consultation and relevant consenting history are provided below.

The proposed siren infrastructure will be owned by FNDC and managed by the Northland Regional Council (**NRC**).

This Assessment of Environmental Effects (**AEE**) has been prepared in accordance with the requirements of Section 88 of and Schedule 4 to the Resource Management Act 1991 (**RMA**) and is intended to provide the information necessary fora full understanding of the activity for which consent is sought and any actual or potential effects the proposal may have on the environment.

## 2.1 Pre-Lodgement Consultation

### 2.1.1 Written Approval – Waka Kotahi New Zealand Transport Agency

Te Karuwha Road Roundabout Roadside Reserve (Parcel ID: 5238333) is located within State Highway 12 which is a designation (NZTA3). Waka Kotahi New Zealand Transport Agency (**NZTA**) is the requiring authority and thus written approval is required pursuant to s176 of the RMA for works occurring within the designation. Of relevance to their request, the proposed location of the siren has been adjusted to be located on the south side of the foot path which traverses the road reserve.

Written approval has been provided for and signed off by the requiring authority on 9th February 2026. Records of consultation have been included within **Appendix 2.**

In conjunction with this application, FNDC, as the owner and maintainer of the road reserve, has provided written approval for the proposed location of the tsunami siren within the road reserve. Records of consultation have been included within **Appendix 3.**

### 2.1.2 Consultation – Te Tii Marae

The applicant has undertaken consultation with representatives of Te Tii Marae to understand whether any cultural concerns or opportunities arise from the proposed location of the tsunami siren. Te Tii Marae has expressed its ongoing support for the proposal.

A record of correspondence has been included at **Appendix 4**.

## 2.2 Consenting History

Northland Regional Council has implemented an extensive staged programme for tsunami siren installation throughout the Far North District over the past three years.

- 2240061-RMALUC (**Stage 1**) was lodged on 03/08/2023, and sought consent to install 27 sirens proposed throughout the Far North District. Through the section 92 process, sirens 62, 63, 71, 76, 100 and 101 were removed from Stage 1. Stage 1 was approved on 18/12/2023 and resulted in the approval of a total of 21 sirens consented.
- 2240307-RMALUC (**Stage 2 – Package 1**) was lodged on 19/01/2024, and sought consent to install eight sirens throughout the Far North District. Siren 103 was removed from Stage 2 and is being sought as a separate application within stage 3. Stage 2- Package 1 was approved on 19/04/2024 and resulted in the approval of a total of seven sirens consented.
- 2240382-RMALUC (**Stage 2 – Package 2**) was lodged on 19/03/2024, and sought consent to install nine sirens throughout the Far North District. Stage 2-Package 2 was approved on 10/05/2024 and resulted in the approval of a total of nine sirens consented.
- Stage 3 of the Northland Tsunami Siren Rollout included individual applications for a further six Tsunami Sirens throughout the Far North District. All applications were approved between September- October 2024.

# 3.0 Site Context

## 3.1 Site Description

Siren 67 is proposed to be located at the Te Karuwha Road Roundabout Roadside Reserve (Parcel ID: 5238333) as shown in **Figure 1** below.

The wider site comprises approximately 3,791 m² and is zoned Commercial (Sub Zone A) under the Operative Far North District Plan (ODP). The site is generally flat in nature and contains a cluster of mature shrubs and trees along a steep portion of the southern boundary of the reserve, adjoining commercially zoned land. The proposed siren is to be located within an existing grassed area adjacent to Puketona Road (State Highway 11) and lies within Designation NZTA3 (Waka Kotahi – New Zealand Transport Agency). A footpath traverses the site, with the proposed siren located between the footpath and the steeped vegetated area along the southern boundary.

The wider locality is characterised by a mix of commercial and residential activities. The town centre of Paihia is located to the south of the proposed siren site and includes a range of commercial uses such as a supermarket, retail outlets, accommodation, takeaway food outlets, restaurants, and bars. Coastal residential properties are also located in proximity. To the north, the

site is located across the bridge over the Waitangi Estuary mouth from Waitangi. The site has outlook toward Te Tī Bay within the Bay of Islands.


**Figure 1: Locality plan. Source: Site Plans.**

The site and location have been selected based on the following criteria:

- concentration of resident population;
- topography and sound propagation;
- availability of public land;
- access to a power supply and telecommunications; and
- serviceability.

In order for the siren to be effective, it is within coastal settlement or built-up area with resident populations. In addition to this and in order for the siren to function, it is required to be located near an electricity supply, be within cell tower coverage, and be easily accessed for ongoing maintenance.

# 4.0 Proposal

A summary of the key elements of the proposal is set out below. More detailed descriptions on particular aspects of the proposal are set out in the specialist reports and plans accompanying the application.

NRC are coordinating Te Taitokerau Northlands region wide roll out of new tsunami sirens to improve the regions emergency management response to the tsunami risk. This application

includes the installation of 1 new siren within the road reserve. A site plan and aerial plan are included at **Appendix 5** and **Appendix 6** demonstrating the location of the siren within the site.

It is proposed to utilise HSS Engineering Warning System Solutions; see **Appendix 7** for specification details. The siren type will be TWS-293 and be mounted on an 8m height mast. See **Figure 3** below to see example of the tsunami siren. Details of the sirens are as follows:

- **Siren:**
    - Siren 67 is proposed as a TWS-293 siren and will have a maximum height of 9.1m. Refer Elevation Plans at **Appendix 8**.
    - Foundation: The siren mast/pole will be set within a precast concrete foundation that is 2.5m x 2.5m in area.
    - The siren is proposed to be painted in Resene's 'Resene Abbey cc' coded as B45-009-231, this colour has a Light Reflectance Value of approximately 15. Refer to **Figure 2** below.

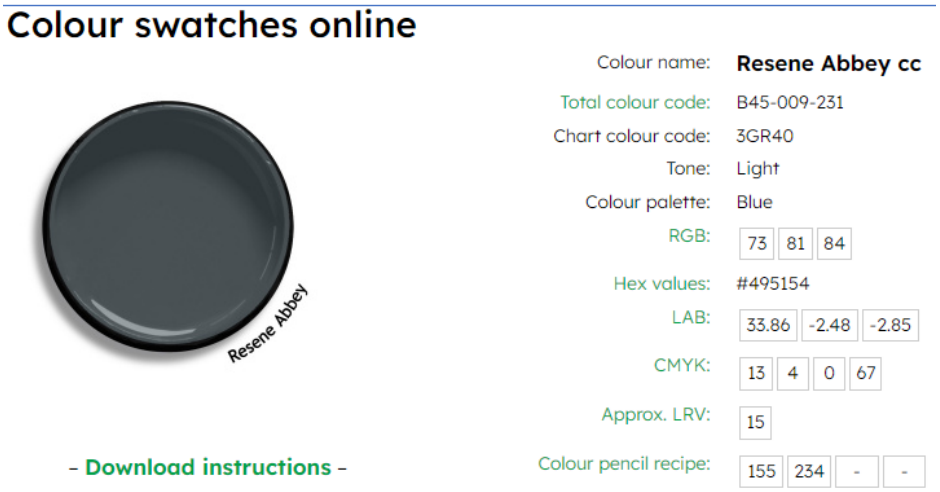


**Figure 2: Proposed structure colour**

- **Bi-annual Tsunami Siren Testing:** The sirens will be tested twice annually at the turn of day light savings. As per 2240061-RMALUC, the following conditions are offered to manage the effects of the bi-annual warning system testing:
    - *The tsunami siren may be tested twice a year at the turn of daylight savings. Each test shall be undertaken for a maximum duration of two minutes during the daytime. Testing of the sirens shall not occur at night.*
- **Earthworks:** Approximately 3.5m$^3$ of earthworks are proposed over an area of 6.5m$^2$ is proposed for each siren to establish a foundation pad which is 2.5m x 2.5m. No vegetation removal is required.
- **Construction staging:** The estimated construction timeframe is 10 days, including to form the platform, install the concrete block foundation, install the mast, mount the siren, and connect the power supply.

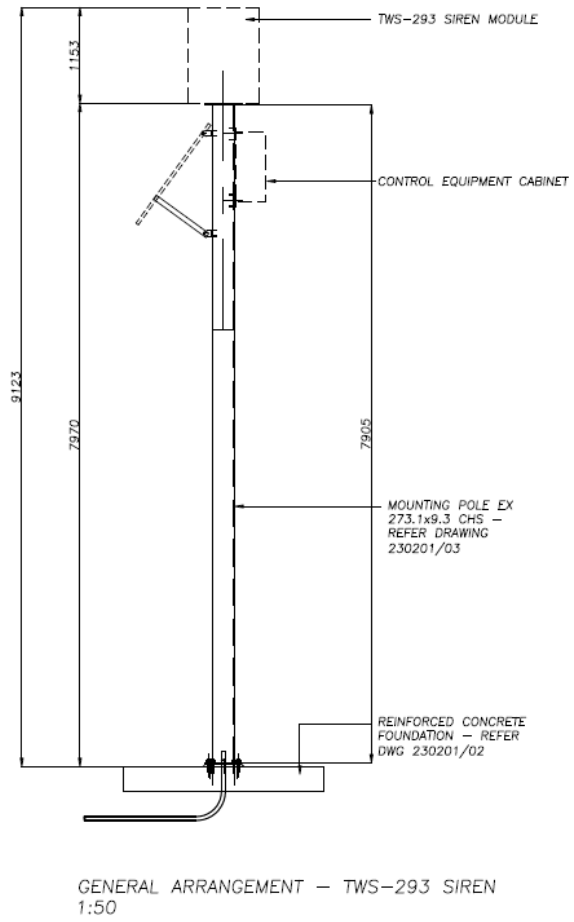


**Figure 3: Elevation Plan of Proposed Siren 67**

Detail of each element described above is provided in the relevant reports or plans.

# 5.0 Reasons for Consent

A rules assessment against the provisions of the ODP is attached as Appendix 11. The site is located within the Commercial Zone (Sub-Zone A2) and is not subject to any overlays under the ODP. Under the PDP the site is to be zoned Mixed Use and subject to the Coastal Environment, Coastal Erosion (Zone 1), Coastal Flood (Zones 1-3), River Flood Hazard Zones (10- and 100-Year ARI Event). The site is within the road reserve of State Highway 11 and under the PDP is identified as designation area NZTA3.

The proposal requires consent for the matters outlined below.

## 5.1 Operative Far North District Plan

### Commercial Zone

- Rule 7.7.5.3.6 Noise: The proposed siren will infringe the permitted noise standard when the siren is operating, being a restricted discretionary activity in accordance with rule 7.7.5.3.6.

## 5.2 Proposed Far North District Plan

Only rules with immediate legal effect require assessment and trigger reasons for consent in accordance with section 96F of the RMA. No rules with immediate legal effect trigger reasons for consent in accordance with section 96F of the RMA.

## 5.3 National Environmental Standard – Contaminated Soils

The NES Contaminated Soils were gazetted on 13th October 2011 and took effect on 1st January 2012.

The standards are applicable if the land in question is, or has been, or is more likely than not to have been used for a hazardous activity or industry and the applicant proposes to subdivide or change the use of the land, or disturb the soil, or remove or replace a fuel storage system.

Proposed Siren 67 is not mapped on Northland Regional Councils Selected Land Use register and there is no information that suggests that the sites have been used for any activities that are on the Hazardous Activities and Industry List (HAIL) or evidence of migration of hazardous substances from adjacent land use.

Based on the above, the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES-CS) does not apply to the proposal.

## 5.4 Activity Status

Overall, this application is for a **restricted discretionary** activity.

# 6.0 Public Notification Assessment (Sections 95A, 95C and 95D)

## 6.1 Assessment of Steps 1 to 4 (Sections 95A)

Section 95A specifies the steps the council is to follow to determine whether an application is to be publicly notified. These are addressed in statutory order below.

### 6.1.1 Step 1: Mandatory public notification is required in certain circumstances

Step 1 requires public notification where this is requested by the applicant; or the application is made jointly with an application to exchange of recreation reserved land under section 15AA of the Reserves Act 1977.

The above does not apply to the proposal.

### 6.1.2 Step 2: If not required by step 1, public notification precluded in certain circumstances.

Step 2 describes that public notification is precluded where all applicable rules and national environmental standards preclude public notification; or where the application is for a controlled activity; or a restricted discretionary, discretionary or non-complying boundary activity.

In this case, the applicable rules do not preclude public notification, and the proposal is not a controlled activity or boundary activity. Therefore, public notification is not precluded.

### 6.1.3 Step 3: If not required by step 2, public notification required in certain circumstances.

Step 3 describes that where public notification is not precluded by step 2, it is required if the applicable rules or national environmental standards require public notification, or if the activity is likely to have adverse effects on the environment that are more than minor.

As noted under step 2 above, public notification is not precluded, and an assessment in accordance with section 95A is required, which is set out in the sections below. As described below, it is considered that any adverse effects will be less than minor.

### 6.1.4 Step 4: Public notification in special circumstances

If an application is not required to be publicly notified as a result of any of the previous steps, then the council is required to determine whether special circumstances exist that warrant it being publicly notified.

Special circumstances are those that are:

- Exceptional or unusual, but something less than extraordinary; or
- Outside of the common run of applications of this nature; or
- Circumstances which make notification desirable, notwithstanding the conclusion that the adverse effects will be no more than minor.

The application is to install one new tsunami siren at Paihia, within the Far North District.

Resource consent is required as a restricted discretionary activity, and the ODP provides for and anticipates this type of activity. The proposal does not infringe any bulk or location controls within the Commercial Zone (Sub-zone A), which anticipates structures of a similar scale and form, such as street lighting or power poles.

It is considered that there is nothing noteworthy about the proposal. It is therefore considered that the application cannot be described as being out of the ordinary or giving rise to special circumstances.

## 6.2 Section 95D Statutory Matters

In determining whether to publicly notify an application, section 95D specifies a council must decide whether an activity will have, or is likely to have, adverse effects on the environment that are more than minor.

In determining whether adverse effects are more than minor:

- Adverse effects on persons who own or occupy the land within which the activity will occur, or any land adjacent to that land, must be disregarded.

The land to be excluded from the assessment is listed in section 6.3 below.

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded.

  In this case under the ODP, there is no relevant permitted baseline as all sirens infringe the noise thresholds.

- Trade competition must be disregarded.

  This is not considered to be a relevant matter in this case.

- The adverse effects on those persons who have provided their written approval must be disregarded.

  Far North District Council as the owner and maintainer of Te Karuwha Road Roundabout Roadside Reserve (Parcel ID: 5238333) has provided their written approval to the proposal and therefore adverse effects on them have been disregarded.

  Waka Kotahi New Zealand Transport Agency as the designated requiring authority for NZTA3 (SH 11) have provided their written approval for works occurring within the designation and therefore adverse effects on them have also been disregarded. See section 12.2 for further details.

The sections below set out an assessment in accordance with section 95D, including identification of adjacent properties, and an assessment of adverse effects.

## 6.3 Land Excluded from the Assessment

In terms of the tests for public notification (but not for the purposes of limited notification or service of notice), the adjacent properties to be excluded from the assessment are shown in **Figure 4** below, and include:

- 2 Te Karuwha Parade, Paihia;
- 164 Marsden Road, Paihia;
- 166 Marsden Road, Paihia;
- 168 Marsden Road, Paihia;
- 2 and 4 Puketona Road, Paihia;
- 1 and 2 Blackridge Road, Paihia; and
- 1 Te Kamara Avenue, Paihia.


**Figure 4: Adjacent properties in relation to subject site. Source: Emaps.**

## 6.4 Assessment of Effects on the Wider Environment

The following sections set out an assessment of wider effects of the proposal, and it is considered that effects in relation to the following matters are relevant:

- Natural Hazards;
- Noise;
- Construction Activities;
- Archaeological and Heritage Effects;
- Cultural Effects;
- Servicing;

These matters are set out and discussed below.

### 6.4.1 Natural Hazards

Siren 67 road reserve is mapped by NRC as being subject to Coastal Erosion (Zone 1:50 Year Scenario), Coastal Flood (Zone 1:50 Year Scenario), Coastal Flood (Zone 2: 100 Year Scenario), Coastal Flood (Zone 3: 100 Year + Rapid Sea Level Rise Scenario), River Flood Hazard Zone (10 Year ARI Event) and River Flood Hazard Zone (100 Year ARI Event). Notably, this siren and the settlement that it is proposed within are mapped by NRC as being subject to tsunami hazard areas.

The siren infrastructure is not considered to exacerbate the natural hazard risk to any other persons, property or land in the wider environment. The proposed siren is located within this area given their proximity to the coastal environment, and are considered to have a functional and

operational need to be located within these areas to alert coastal communities of potential tsunami threat and hazards, as such mitigating against this potential adverse effect.

These areas correspond with low lying areas near the coast and shorelines. The proposed tsunami siren is a relatively modest structure in terms of footprint and mass, is non-habitable and only involves minimal earthworks to establish the building platform (approximately 3.5m3 over 6.5m2). Following the preparation, a flat building platform, a pre-cast concrete foundation will be installed with the siren mast which the siren will be mounted to. While the infrastructure may at times be susceptible to coastal inundation and erosion in the future, the infrastructure itself is considered to be structurally resilient to the natural hazard risk for its 50-year life and purpose.

For the reasons outlined above, adverse effects on the localised and wider environment are assessed as less than minor.

### 6.4.2 Noise

The proposed tsunami siren is anticipated to infringe the permitted noise thresholds within the ODP when activated. This is not unexpected given the purpose of the siren is to alert residents within the coastal settlement in the event of possible tsunami threat.

Acoustic Advice has been prepared by Marshall Day Acoustic Engineers (refer to **Appendix 9**) which estimates the distance that the noise thresholds may be exceeded. This is based on the projected noise emissions for each siren when activated. Marshall Day estimated noise levels will be exceeded during siren activation as follows:

- Day time testing: 50 dB $L_{Aeq}$ will be exceeded when emitted from Residential, Rural or Coastal Zones for a distance of 1,400m during day time testing.
- Day time emergency: 50 dB $L_{Aeq}$ will be exceeded when emitted from Residential, Rural, and Coastal Zones for a distance of 3,300m during a day emergency.
- Night time emergency: 45 dB $L_{Aeq}$ will be exceeded when emitted from Residential, Rural, and Coastal Zones for a distance of 5,100m during a night time emergency.

While these thresholds are not site-specific propagation lines, they provide a useful comparison for how 'noisy' the proposed tsunami sirens will be during testing and in the during an emergency tsunami event. The noise emissions generated by the sirens during an emergency event while noisy are considered necessary. The proposed sirens are considered lifesaving infrastructure, designed to improve community resilience, readiness and response to the threat of tsunami risk.

In terms of frequency of noise exceedance, tsunami siren warnings are currently tested twice a year at the turn of daylight savings and it is intended to carry on this practice with the newly installed sirens. This testing, while operationally necessary, ensures the communities are familiar with the siren alerts and prompts good emergency evacuation practices within each community. It is designed to encourage communities to familiarise themselves with tsunami emergency evacuation practices and gathering points. To support this process, CDEM and NRC notify the public of these warning systems on their website. Given the infrequent nature of these tsunami warning and testing systems, effects on properties are considered to be temporary and experienced for a matter of minutes and overall acceptable.

Taking into account the above and the proposed restrictions to siren duration and frequency over the course of the year, the expert advice of Marshall Day Acoustic Engineers (see **Appendix 9**), adverse effects of the tsunami warning systems are managed to a level that is less than minor.

### 6.4.3 Construction Activities

Minimal earthworks are proposed to modify the site to enable the construction of the foundation pads for the masts to be installed, the TWS-293 will then be attached to the mast. No vegetation removal is proposed. Refer to the Tsunami Specifications included as **Appendix 7** for full details. This will include excavation of a maximum volume of $3.5m^3$ over an area of $6.5m^2$ to establish suitable levels for the foundation pads.

During construction, it is proposed to install temporary sediment and erosion control measures to mitigate any potential adverse environmental effects as a result of the proposed land disturbance. Any adverse construction effects on the wider environment are considered to be less than minor as follows:

- It is anticipated that the construction works will be able to comply with the ODP construction noise and vibration standards having regard to the nature of the proposal. The duration of works and timeframes are estimated to take no more than 10 working days to install each siren. However, it is expected that a Construction Management Plan for the works will be outlined as required should a condition of consent be applied. It is considered that any adverse effects associated with construction noise and vibration would be temporary in nature, and are considered to be less than minor;
- It is anticipated that earthworks and construction will be carried out during standard construction hours, such that any adverse lighting effects on the wider environment are not anticipated; and
- There is sufficient space at all sites and within the surrounding road network to provide parking for construction vehicles. It is considered that any adverse construction traffic effects will be temporary and able to be appropriately managed. For works occurring within the road corridor, it is anticipated that a CAR and TMP will be provided prior to commencing construction.

Overall, having regard to the above, it is considered that any adverse construction effects will be less than minor.

### 6.4.4 Archaeological and Heritage Effects

An ArchSite search has been undertaken and is demonstrated in **Figure 5.** The assessment provides a screen shot of the proposed siren location with respect to any known or recorded archaeological features. It is noted that the siren is proposed to be located in proximity to potential archaeology. While it is recognised that the proposed tsunami sirens are located largely within coastal environments where there is the potential for archaeology to exist, effects in this regard are considered to be less than minor for the following reasons:

- The proposal only involves approximately $3.5m^3$ over an area of approximately $6.5m^2$, ensuring minimal disturbance of land;
- Taking into account the ArchSite assessment and overall physical works proposed, the probability of discovering archaeology is considered low;
- No sirens are proposed over known or recorded archaeological sites; and
- Should any archaeological material be encountered, typical accidental discovery protocols will be followed as set out in the Heritage New Zealand Pouhere Taonga Act 2014.

Taking into account the above, and recognising the accidental discovery protocols required under the Heritage New Zealand Pouhere Taonga Act 2014, adverse effects are assessed as less than minor.

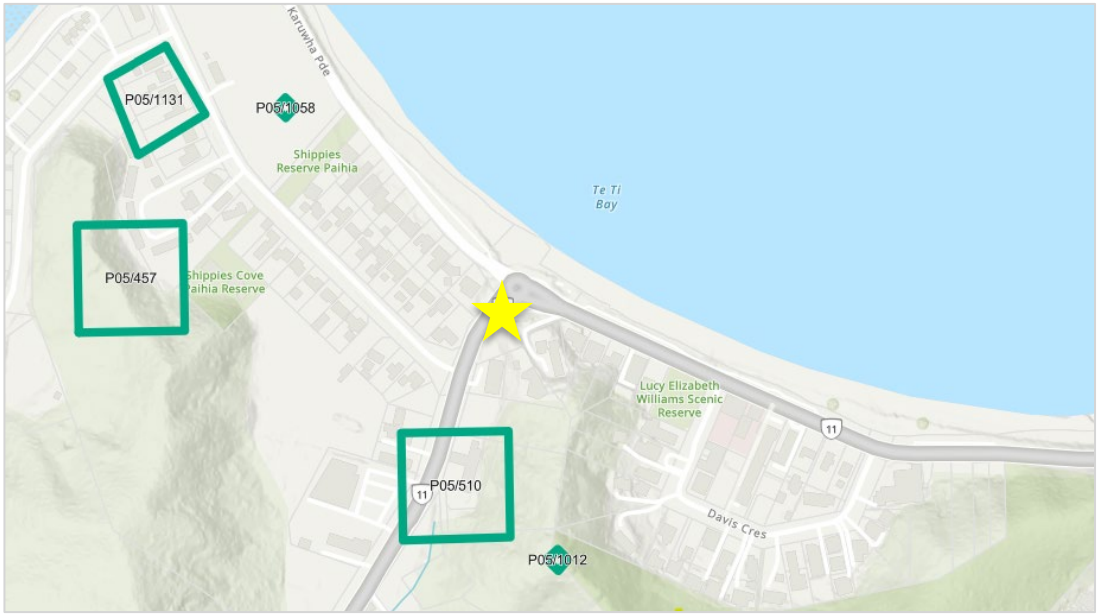


**Figure 5: Archaeological Assessment - Te Kauwhara Roundabout Road Reserve. Source: Archsite**

### 6.4.5 Cultural Effects

The proposed tsunami siren 67 is not located within a site that is mapped as containing a site of significance to Māori in the ODP or PDP. It is important to note that none of the proposed sirens will be located within any mapped statutory acknowledgement areas or mapped sites of significance to Māori. While there are no known Māori values of importance in this area, it is acknowledged that the siren is in proximity to the coast which holds importance to mana whenua.

No vegetation clearance is proposed as part at any of the sites. The proposed infrastructure does not impact access to the beach ensuring the access to mahinga kai will be maintained for mana whenua.

In terms of wider environment considerations, the proposed siren has been shared with Te Tii Marae who have supplied approval for the proposed location of Tsunami Siren 67 to be located. Please see Appendix 4 for full copy of this correspondence.

Taking the above into account, there are no known adverse effects on scheduled cultural heritage, sites of significance to Māori, or Māori cultural values.

### 6.4.6 Servicing

The siren site has been chosen based on the topography and how the location will be able to service the new siren in terms of having access to better cellular and satellite coverage, and have access to solar and battery power. The siren location has been confirmed as suitable from a servicing perspective.

## 6.5 Summary of Effects

Overall, it is considered that any adverse effects on the environment relating to this proposal will be less than minor.

## 6.6 Public Notification Conclusion

Having undertaken the section 95A public notification tests, the following conclusions are reached:

- Under step 1, public notification is not mandatory;
- Under step 2, public notification is not precluded;
- Under step 3, public notification is not required as it is considered that the activity will result in less than minor adverse effects; and
- Under step 4, there are no special circumstances.
- Therefore, based on the conclusions reached under steps 3 and 4, it is recommended that this application be processed without public notification.

# 7.0 Limited Notification Assessment (Sections 95B, 95E to 95G)

## 7.1 Assessment of Steps 1 to 4 (Sections 95B)

If the application is not publicly notified under section 95A, the council must follow the steps set out in section 95B to determine whether to limited notify the application. These steps are addressed in the statutory order below.

### 7.1.1 Step 1: Certain affected protected customary rights groups must be notified

Step 1 requires limited notification where there are any affected protected customary rights groups or customary marine title groups; or affected persons under a statutory acknowledgement affecting the land.

The above does not apply to this proposal.

### 7.1.2 Step 1: Certain affected protected customary rights groups must be notified

Step 2 describes that limited notification is precluded where all applicable rules and national environmental standards preclude limited notification; or the application is for a controlled activity (other than the subdivision of land).

In this case, the applicable rules do not preclude limited notification and the proposal is not a controlled activity. Therefore, limited notification is not precluded.

### 7.1.3 Step 3: If not precluded by step 2, certain other affected persons must be notified

Step 3 requires that, where limited notification is not precluded under step 2 above, a determination must be made as to whether any of the following persons are affected persons:

- In the case of a boundary activity, an owner of an allotment with an infringed boundary;

- In the case of any other activity, a person affected in accordance with s95E.

The application is not for a boundary activity, and therefore an assessment in accordance with section 95E is required and is set out below.

Overall, it is considered that any adverse effects on persons will be less than minor, and accordingly, that no persons are adversely affected.

### 7.1.4 Step 4: Further notification in special circumstances

In addition to the findings of the previous steps, the council is also required to determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined as eligible for limited notification.

In this instance, having regard to the assessment in section 6.1.4 above, it is considered that special circumstances do not apply.

## 7.2 Section 95E Statutory Matters

If the application is not publicly notified, a council must decide if there are any affected persons and give limited notification to those persons. A person is affected if the effects of the activity on that person are minor or more than minor (but not less than minor).

In deciding who is an affected person under section 95E:

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded;
- Only those effects that relate to a matter of control or discretion can be considered (in the case of controlled or restricted discretionary activities); and
- The adverse effects on those persons who have provided their written approval must be disregarded.

These matters were addressed in section 6.2 above, and no written approval have been obtained.

Having regard to the above provisions, an assessment is provided below.

## 7.3 Assessment of Effects on Adjacent Properties

Adverse effects in relation to noise on persons are considered below.

Wider effects, were considered above, and considered to be less than minor.

### 7.3.1 Noise

The siren will exceed the permitted noise thresholds during an emergency alert and testing. As noted above, this testing regime will encourage and promote tsunami siren evacuation practice and familiarise communities with the warning signals associated with this activity. While it is recognised that these warning systems will be noisy, effects will be temporary and considered necessary to promote good CDEM practices. Taking into account the temporary nature of the noise exceedance, adverse effects on the properties and persons that experience the exceeded noise levels are considered less than minor. Taking into account the temporary nature of the noise

exceedance, adverse effects on the properties and persons that experience the exceeded noise levels are considered less than minor.

### 7.3.2 Summary of Effects

Taking the above into account, it is considered that any adverse effects on persons at the aforementioned properties will be less than minor in relation to noise effects. Wider effects, were assessed in above and are considered to be less than minor.

It is considered, therefore, that there are no adversely affected persons in relation to this proposal.

## 7.4 Limited Notification Conclusion

Having undertaken the section 95B limited notification tests, the following conclusions are reached:

- Under step 1, limited notification is not mandatory;
- Under step 2, limited notification is not precluded;
- Under step 3, limited notification is not required as it is considered that the activity will not result in any adversely affected persons; and
- Under step 4, there are no special circumstances.

Therefore, it is recommended that this application be processed without limited notification.

# 8.0 Consideration of Applications (Section 104)

## 8.1 Statutory Matters

Subject to Part 2 of the Act, when considering an application for resource consent and any submissions received, a council must, in accordance with section 104(1) of the Act have regard to:

- Any actual and potential effects on the environment of allowing the activity;
- Any relevant provisions of a national environmental standard, other regulations, national policy statement, a New Zealand coastal policy statement, a regional policy statement or proposed regional policy statement; a plan or proposed plan; and
- Any other matter a council considers relevant and reasonably necessary to determine the application.

As a restricted discretionary activity, section 104C of the Act states that a council:

(1) may grant or refuse the application;

(2) must only consider matters over which a discretion is restricted; and

(3) if it grants the application, may impose conditions under section 108 only for those matters which it has restricted the exercise of its discretion in its plan.

## 8.2 Weighting of Proposed Plan Changes: Proposed Far North District Plan

On the 27th July Far North District Council (FNDC) notified their Proposed District Plan (PDP).

Under the Proposed Far North District Plan, siren 67 is zoned Mixed Use and subject to Coastal Environment Overlay.

At the time of preparing this AEE, only rules identified as having immediate legal effect have been considered. This will remain the case until FNDC releases a decision on the Proposed Far North District Plan.

# 9.0 Effects on the Environment (Section 104(1)(A))

Having regard to the actual and potential effects on the environment of the activity resulting from the proposal, it was concluded in the assessment above that any adverse effects relating to the proposal will be less than minor and that no persons would be adversely affected by the proposal.

Further, it is considered that the proposal will also result in positive effects including:

- The improved health and safety measures to support the wellbeing of coastal community at Waitangi; and
- Improved civil defence and emergency management practices in Waitangi and Paihia, designed to contribute to the regions civil defence and resilience to natural hazards within Te Taitokerau Northland; and
- Currently, the sirens do not achieve the minimum National Emergency Management Agency (NEMA) standards for tsunami sirens and alerts. The proposal will ensure Te Taitokerau Northland is in line with NEMA standards and best practice.

Overall, it is considered that when taking into account the positive effects, any actual and potential adverse effects on the environment of allowing the activity are acceptable.

# 10.0 District Plan and Statutory Documents (Section 104(1)(B))

## 10.1 National Policy Statement for Natural Hazards

The National Policy Statement for Natural Hazards (NPS-NH) requires natural hazard risk to people and proposed works associated with subdivision, use, and development to be managed using a risk-based and proportionate response. Resource consent applications are to be assessed against the prescribed risk matrix, which considers the likelihood and consequence of potential natural hazard events.

In this instance, a desktop assessment of the Northland Regional Council Advanced Natural Hazards GIS Viewer has been undertaken. This confirms that the subject site is subject to the following hazards;

- Coastal Erosion (Zone 1:50 Year Scenario);
- Coastal Flood (Zone 1:50 Year Scenario), Coastal Flood (Zone 2: 100 Year Scenario), Coastal Flood (Zone 3: 100 Year + Rapid Sea Level Rise Scenario); and
- River Flood Hazard Zone (10 Year ARI Event) and River Flood Hazard Zone (100 Year ARI Event).

While the NPS-NH seeks to manage development using a risk-based and proportionate approach, the intent of the proposed tsunami siren is to support and safeguard the wellbeing of Far North District communities by improving resilience to tsunami risk. The bulk and location of the proposed siren is not considered to exacerbate the effects of flooding or coastal erosion on the site or adjacent properties, given the minor scale of works and limited building platform requirements.

As outlined throughout this application, tsunami sirens are an important tool within the Civil Defence Emergency Management (CDEM) framework for managing natural hazard risk. The siren is therefore considered to be essential life-saving infrastructure, serving an important functional purpose for these coastal communities and settlements.

As such, the proposal is considered to be generally consistent with the objectives and policies of the NPS-NH.

## 10.2 National Policy Statement for Infrastructure

The National Policy Statement for Infrastructure (**NPS-I**) seeks to support the delivery and operation of national, regional, and local infrastructure to promote the social, economic, environmental, and cultural wellbeing of people and communities, including their health and safety.

Policy 1(2)(g) requires decision-makers to recognise that infrastructure provides benefits, including reducing risks from and improving resilience to natural hazards and climate change.

The proposed tsunami siren constitutes regionally significant emergency management infrastructure. Its primary purpose is to provide early warning in the event of a tsunami, thereby reducing risk to human life and improving community resilience to tsunami events. The siren forms part of a wider, regional and district-wide tsunami warning network implemented by Te Taitokerau's Civil Defence and Northland Regional Council.

The proposal therefore directly aligns with and gives effect to Policy 1(2)(g), as it enhances natural hazard preparedness and contributes to safeguarding the health and safety of the Paihia and Waitangi communities.

Accordingly, the proposal is consistent with the intent and direction of the NPS-I.

## 10.3 Objectives and Policies of the Far North District Plan

### 10.3.1 Chapter 7.7 Commercial

Siren 67 is located within the Commercial Zone, which applies to established commercial centres throughout the district and provides for a wide range of urban activities. The physical location of Siren 67 is within a road reserve, which is administered and maintained by the FNDC. The site is also subject to Designation NZTA3, and is therefore under the designating authority of Waka Kotahi New Zealand Transport Agency.

The purpose of the Commercial Zone is to provide for the development of commercial centres and a range of compatible activities, while avoiding, remedying, or mitigating adverse effects on the surrounding environment and adjacent activities. While tsunami siren infrastructure is not specifically anticipated within the ODP and does not clearly align with the defined terms for telecommunications or utility services, the proposal is considered to be consistent with the overall intent of the zone.

The objectives and policies of Chapter 7.7 seek to enable commercial and other activities to establish within centres where they provide for commercial needs, are mutually compatible, and benefit from close locational relationships with surrounding communities. The proposed tsunami siren is considered to align with these objectives, as it supports the health and wellbeing of the Paihia and Waitangi communities by providing an early warning system in the event of a tsunami.

The bulk and location of the proposed siren is consistent with the existing urban and built environment character of the Commercial Zone and is similar in scale to other infrastructure elements typically found within road reserve environments. The proposal will not require vegetation clearance and will involve only minimal land disturbance associated with installation works.

Overall, while the siren infrastructure is not explicitly provided for under the ODP, it is not considered to compromise the purpose of the Commercial Zone. In summary, the proposal is considered to be consistent with the objectives and policies of the Commercial Zone and aligns with the intent of the zone framework.

### 10.3.2 Chapter 12.4 Natural Hazards

The objectives and policies of the natural hazards chapter are contained within Chapter 12.4 of the ODP and seek to reduce the threat of natural hazards to life, property and the environment.

While the parcel has areas that are subject to Coastal flooding per the NRC Hazard Maps, the proposed siren infrastructure is not within the hazard overlays, nor does it introduce new vulnerable activities and is proposed to protect the community from tsunami hazard risk.

The proposal is considered consistent with the intent of the natural hazards chapter.

## 10.4 Objectives and Policies of the Proposed Far North Plan

The proposal results in tsunami siren infrastructure being located within the Mixed-Use Zone. The proposal also interreacts with overlays that include the Coastal Environment, Coastal Flood Zone 1, 2 and 3, River Flood Hazard 10-, 50 year and 100-year ARI Event, and Coastal Erosion.

For the purposes of this application, the proposal has been categorised as a Temporary Activity, which is defined as follows:

> "means an activity that is temporary and limited in duration. It may include carnivals; concerts; fairs; festivals and events; markets and exhibitions; public meetings; parades; special events; sporting events; filming activities; temporary military training activities; temporary motorsport activities; and emergency response training by ambulances, Civil Defence, Coast Guard New Zealand, Fire and Emergency New Zealand, New Zealand Police, Land Search and Rescue, or Surf Life Saving New Zealand. It also includes buildings or structures accessory to temporary activities, temporary car parking areas, and the ancillary activities associated with the temporary activities."

The proposal has been categorised as an Emergency Service, which is defined as follows:

> "Emergency Service, means ambulances, Civil Defence, Coastguard New Zealand, Fire and Emergency New Zealand, New Zealand Police, Land Search and Rescue, and Surf Life Saving New Zealand."

While the above activity definition is the most appropriate, the PDP does not specifically provide for CDEM structures like tsunami sirens. However, it does provide for noise exemptions relating to emergency services. In the Noise Chapter, the noise rules and effects standards do not apply to:

> "7. any warning device or siren used by emergency services for emergency purposes (and routine testing and maintenance)"

Overall, it is considered that there is a gap within the PDP with respect to CDEM service activities, which are considered fairly unique and uncommon in this context but are nonetheless important and required support the Regions civil defence and emergency management response. The proposed tsunami siren infrastructure is pivotal to the Region's resilience plan for managing and addressing the risk of tsunami hazards within Te Taitokerau. Further, the proposal is considered to support the overall health, safety and wellbeing of the Region's communities.

On this basis, the proposal is not considered to be contrary to, but is not entirely consistent with the anticipated outcomes of the PDP.

## 10.5 Objectives and Policies of the Regional Policy Statement for Northland

The operative Regional Policy Statement (**RPS**) for Northland contains high level policy guidance for development within the region and is the vehicle for identifying and dealing with significant resource management issues in Te Taitokerau Northland. With respect to the coastal environment, it contains objectives and policies which seek to protect and preserve the natural character of the coastal environment, whilst safeguarding the integrity, form, function and resilience of the coastal environment from natural hazards and protect significant indigenous biodiversity and habitats from inappropriate subdivision, use and development. Of particular relevance to this proposal are as follows:

- Objective 3.7 and 3.8 seek to provide for significant infrastructure that will protect health and safety of the community and recognise the importance of the long-term infrastructure.
- Objective 3.13 recognises the risk and impacts of natural hazard events. 3.13(b), (e) and (g) are of particular relevance to this proposal as they enable appropriate hazard mitigation measures to be constructed and recognise that critical infrastructure may have to be located within hazard prone areas.

In regards to above objectives and policies, the following is noted:

- The proposal is considered appropriate and a functional need for the reasons discussed throughout the assessment provided as part of this application.
- The tsunami sirens are a method that will mitigate coastal hazards such as tsunami by alerting the community and to ensure their safety.

On this basis, the proposal is considered to be consistent with outcomes of the RPS.

## 10.6 New Zealand Coastal Policy Statement

The New Zealand Coastal Policy Statement (**NZCPS**), prepared by the Minister of Conservation, sets out objectives and policies in order to achieve the purpose of the RMA in regards to the coastal environment of New Zealand. It contains objectives and policies which include those aimed at safeguarding the integrity, form, functioning and resilience of the coastal environment and sustaining its ecosystems, and preserving the natural character of the coastal environment.

Of particular relevance to this proposal are objectives 2, 4, 6 and policies 6, 13, 18, 19, 24 and 25 as follows:

Objective 2 and policy 13 seek to preserve the natural character, features, and landscape values of the coastal environment.

Objective 4 and policies 18 and 19 seek to maintain and enhance public open space within the coastal environment by ensuring public access to the coast is retained and provided for.

Objective 6 recognises that the protection of the values of the coastal environment does not preclude use and development in appropriate places and forms within appropriate limits, and that functionally some uses and development can only be located on the coast or in the marine area. Policy 6(2)(c) further acknowledges that there are activities with a functional need to be located in the coastal marine area.

Policies 24 and 25 seek to identify areas that are potentially to be affected by coastal hazards such as tsunami and how to avoid or mitigate them.

In regards to above objectives and policies, the following is noted:

The proposed siren site is not identified as an outstanding feature or landscape. The proposed activity does not restrict public access in any way. The proposal is considered appropriate and has a functional and operational need to be located within the coastal environment for the reasons discussed throughout the assessment provided as part of this application.

The tsunami siren is a method that will mitigate coastal hazards such as tsunami by alerting the community and to ensure their safety. For the reasons noted above, it is considered that the proposal is aligned with the outcomes sought by the NZCPS.

### 10.7 Summary

It is considered that the proposed development is generally in accordance with the objectives and policies of the National Policy Statements, ODP, PDP,RPS and NZCPS.

## 11.0 Part 2 Matters

Section 5 of Part 2 identifies the purpose of the RMA as being the sustainable management of natural and physical resources. This means managing the use, development and protection of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic well-being and health and safety while sustaining those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding, remedying or mitigating adverse effects on the environment.

Section 6 of the Act sets out a number of matters of national importance including (but not limited to) the protection of outstanding natural features and landscapes and historic heritage from inappropriate subdivision, use and development.

Section 7 identifies a number of “other matters” to be given particular regard by Council and includes (but is not limited to) Kaitiakitanga, the efficient use of natural and physical resources, the maintenance and enhancement of amenity values, and maintenance and enhancement of the quality of the environment.

Section 8 requires Council to take into account the principles of the Treaty of Waitangi.

Overall, as the effects of the proposal are considered to be less than minor, and the proposal accords with the relevant ODP objectives and policies, it is considered that the proposal will not offend against the general resource management principles set out in Part 2 of the Act.

# 12.0 Other Matters (Section 104(1)(C))

## 12.1 Record of Title Interests

Confirmation from Land Information New Zealand confirms that the site is legally held as a road reserve and is not subject to any interests (refer to **Appendix 1**).

## 12.2 Section 176 Approvals

The proposed location of Siren 67 is within a road reserve adjacent to State Highway 11 and is located within Designation NZTA3 (SH11), for which Waka Kotahi New Zealand Transport Agency is the requiring authority.

Section 176 of the Resource Management Act 1991 provides that no person may undertake work within a designation unless the work is undertaken by, or on behalf of, the requiring authority and is in accordance with the designation.

While the proposed tsunami siren is not directly provided for within the designation purpose, written approval for the proposed location and associated works has been obtained from Waka Kotahi on 9 February 2026. Accordingly, the works are considered acceptable within the designation, and an Outline Plan of Works under section 176A is not required in this instance.

See **Appendix 2** for written approval from NZTA.

# 13.0 Conclusion

The proposal involves the construction of one siren at Te Karuwha Road Roundabout Roadside Reserve, within in the Far North District.

Based on the above report it is considered that:

- Public notification is not required as adverse effects in relation to natural hazards, noise, construction activities, archeological and heritage effects, cultural effects, and servicing are considered to be less than minor;
- There are also positive effects including the health and safety of coastal communities in the Far North;
- Limited notification is not required as is not required as no persons at adjacent properties are considered to be adversely affected, with written approval being obtained by both NZTA and FNDC regarding the proposed location.
- The proposal accords with the relevant ODP, PDP, RPS objectives and policies; and
- The proposal is considered to be consistent with Part 2 of the Act.

It is therefore concluded that the proposal satisfies all matters the consent authority is required to assess, and that it can be granted on a non-notified basis.

Parcel ID

5238333

Title type

Title status

# Parcel: (ID) 5238333

## Summary

| | |
|---|---|
| Appellation | - |
| Parcel Status | Current |
| Intent | Road |
| Associated Feature | - |
| Land District | North Auckland |
| Non Surveyed Definition | - |
| Parcel ID | 5238333 |
| Parcel Area | - |
| Total Area | - |

## Laura Bowman

**From:** Tim Elliott <Tim.Elliott@nzta.govt.nz>
**Sent:** Monday, 9 February 2026 11:10 am
**To:** Brendon Gray <brendon.gray@nrc.govt.nz>; Aran Arrieta <aran.arrieta@nzta.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

Hi Brendan –

Thanks for the confirmation, as long as the siren and its associated equipment doesn't imped the use of the footpath then I have no concerns with the proposal – I'd recommend you contact Cath.Beaumont@fndc.govt.nz at FNDC who is their Road Corridor Manager, FNDC are looking to undertake work in the grassed areas of the roundabout to better manage parking during Waitangi.

Regards

Tim


### Tim Elliott

**Senior Safety Engineer, Northland, Transport Services**
Te Toki Tārai
Email: tim.elliott@nzta.govt.nz
Phone: 09 955 1037

**NZ Transport Agency Waka Kotahi**
Auckland, Level 5, AON Centre, 29 Customs Street West
Private Bag 106602, Auckland 1143, New Zealand
Connect with us on social media



**From:** Brendon Gray <brendon.gray@nrc.govt.nz>
**Sent:** Monday, 9 February 2026 10:51 AM
**To:** Tim Elliott <Tim.Elliott@nzta.govt.nz>; Aran Arrieta <Aran.Arrieta@nzta.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

Hey Tim,

Yes, that is correct. The siren would be located on the south side of the footpath.

Nga Mihi

**Brendon Gray**
Partnerships Manager
**Northland Emergency Management Group » Te Kaunihera ā rohe o Te Taitokerau**
**P** 0800 002 004 **» W** www.nrc.govt.nz/civildefence/

**Book a meeting with me directly –** This way you can book directly into my calendar and skip the back and forth of trying to find a time that suits.

---

**From:** Tim Elliott <Tim.Elliott@nzta.govt.nz>
**Sent:** Monday, 9 February 2026 9:04 am
**To:** Brendon Gray <brendon.gray@nrc.govt.nz>; Aran Arrieta <aran.arrieta@nzta.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

Hi Brendon

Thanks for the e-mail – would you be able to confirm that the siren will be behind the footpath please.

Regards

Tim

## Tim Elliott

**Senior Safety Engineer, Northland, Transport Services**
Te Toki Tārai
Email: tim.elliott@nzta.govt.nz
Phone: 09 955 1037

**NZ Transport Agency Waka Kotahi**
Auckland, Level 5, AON Centre, 29 Customs Street West
Private Bag 106602, Auckland 1143, New Zealand
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---

**From:** Brendon Gray <brendon.gray@nrc.govt.nz>
**Sent:** Thursday, 5 February 2026 9:52 AM
**To:** Aran Arrieta <Aran.Arrieta@nzta.govt.nz>
**Cc:** Kobus Du Toit <Kobus.DuToit@nzta.govt.nz>; Tim Elliott <Tim.Elliott@nzta.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

You don't often get email from brendon.gray@nrc.govt.nz. Learn why this is important

Kia ora Aran,

I hope you are well.

We have one more tsunami siren that we have had a long struggle to find suitable locations for, Waitangi.
We've been working with Hapu there, and they support the proposed location, but it is NZTA roadside reserve. Can I please get approval to locate a siren at this site?


Nga Mihi

**Brendon Gray**
Partnerships Manager
**Northland Emergency Management Group » Te Kaunihera ā rohe o Te Taitokerau**
**P** 0800 002 004 **» W** www.nrc.govt.nz/civildefence/

Book a meeting with me directly – This way you can book directly into my calendar and skip the back and forth of trying to find a time that suits.

## Laura Bowman

**From:** Cath Beaumont <Cath.Beaumont@fndc.govt.nz>
**Sent:** Monday, 9 February 2026 11:42 am
**To:** Brendon Gray <brendon.gray@nrc.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

Hi Brendon

I have no problem with the placement at all and thanks for getting in touch.

Kind regards

Cath

**Cath Beaumont**
Road Corridor Manager
**M** 272135672 | **P** 6494015760 | Cath.Beaumont@fndc.govt.nz
**Te Kaunihera o Te Hiku o te Ika | Far North District Council**

**Pokapū Kōrero 24-hāora | 24-hour Contact Centre 0800 920 029**
**fndc.govt.nz**


**From:** Brendon Gray <brendon.gray@nrc.govt.nz>
**Sent:** Monday, 9 February 2026 11:19 am
**To:** Cath Beaumont <Cath.Beaumont@fndc.govt.nz>
**Subject:** FW: Tsunami Siren Replacement Project - Waitangi

You don't often get email from brendon.gray@nrc.govt.nz. Learn why this is important

**CAUTION:** This email originated from outside Far North District Council.
Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi Cath,

I just wanted to make sure you are aware of this site that is part of a wider project. You may have seen some of these sirens around the district, and around the rest of Northland.
These are FNDC owned assets, under Ruben Garcia ultimately. This is the last to require approval.
Do you have any issues with this location? It is approved by Hapū and NZTA.

Nga Mihi

**Brendon Gray**
Partnerships Manager

**Northland Emergency Management Group » Te Kaunihera ā rohe o Te Taitokerau**
**P** 0800 002 004 **» W** www.nrc.govt.nz/civildefence/

**Book a meeting with me directly –** This way you can book directly into my calendar and skip the back and forth of trying to find a time that suits.

---

**From:** Tim Elliott <Tim.Elliott@nzta.govt.nz>
**Sent:** Monday, 9 February 2026 11:10 am
**To:** Brendon Gray <brendon.gray@nrc.govt.nz>; Aran Arrieta <aran.arrieta@nzta.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

Hi Brendan –

Thanks for the confirmation, as long as the siren and its associated equipment doesn't imped the use of the footpath then I have no concerns with the proposal – I'd recommend you contact Cath.Beaumont@fndc.govt.nz at FNDC who is their Road Corridor Manager, FNDC are looking to undertake work in the grassed areas of the roundabout to better manage parking during Waitangi.

Regards

Tim

## Tim Elliott

**Senior Safety Engineer, Northland, Transport Services**
Te Toki Tārai
Email: tim.elliott@nzta.govt.nz
Phone: 09 955 1037

**NZ Transport Agency Waka Kotahi**
Auckland, Level 5, AON Centre, 29 Customs Street West
Private Bag 106602, Auckland 1143, New Zealand
Connect with us on social media



---

**From:** Brendon Gray <brendon.gray@nrc.govt.nz>
**Sent:** Monday, 9 February 2026 10:51 AM
**To:** Tim Elliott <Tim.Elliott@nzta.govt.nz>; Aran Arrieta <Aran.Arrieta@nzta.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

Hey Tim,

Yes, that is correct. The siren would be located on the south side of the footpath.

Nga Mihi

**Brendon Gray**
Partnerships Manager
**Northland Emergency Management Group » Te Kaunihera ā rohe o Te Taitokerau**
**P** 0800 002 004 **» W** www.nrc.govt.nz/civildefence/

**Book a meeting with me directly –** This way you can book directly into my calendar and skip the back and forth of trying to find a time that suits.

---

**From:** Tim Elliott <Tim.Elliott@nzta.govt.nz>
**Sent:** Monday, 9 February 2026 9:04 am
**To:** Brendon Gray <brendon.gray@nrc.govt.nz>; Aran Arrieta <aran.arrieta@nzta.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

Hi Brendon

Thanks for the e-mail – would you be able to confirm that the siren will be behind the footpath please.

Regards

Tim

## Tim Elliott

**Senior Safety Engineer, Northland, Transport Services**
Te Toki Tārai
Email: tim.elliott@nzta.govt.nz
Phone: 09 955 1037

**NZ Transport Agency Waka Kotahi**
Auckland, Level 5, AON Centre, 29 Customs Street West
Private Bag 106602, Auckland 1143, New Zealand
Connect with us on social media



---

**From:** Brendon Gray <brendon.gray@nrc.govt.nz>
**Sent:** Thursday, 5 February 2026 9:52 AM
**To:** Aran Arrieta <Aran.Arrieta@nzta.govt.nz>
**Cc:** Kobus Du Toit <Kobus.DuToit@nzta.govt.nz>; Tim Elliott <Tim.Elliott@nzta.govt.nz>
**Subject:** RE: Tsunami Siren Replacement Project - Waitangi

> You don't often get email from brendon.gray@nrc.govt.nz. Learn why this is important

Kia ora Aran,

I hope you are well.

We have one more tsunami siren that we have had a long struggle to find suitable locations for, Waitangi.
We've been working with Hapu there, and they support the proposed location, but it is NZTA roadside reserve. Can I please get approval to locate a siren at this site?


Nga Mihi

**Brendon Gray**
Partnerships Manager
**Northland Emergency Management Group » Te Kaunihera ā rohe o Te Taitokerau**
**P** 0800 002 004 **» W** www.nrc.govt.nz/civildefence/

Book a meeting with me directly – This way you can book directly into my calendar and skip the back and forth of trying to find a time that suits.

## Laura Bowman

**From:** Papanui Polamalu <papanuip@nrc.govt.nz>
**Sent:** Monday, 19 January 2026 1:07 pm
**To:** Brendon Gray <brendon.gray@nrc.govt.nz>
**Subject:** FW: Waitangi Tsunami Siren location

**From:** Whati Rameka <whati.rameka@tetiiwaitangi.co.nz>
**Sent:** Monday, 19 January 2026 12:12 pm
**To:** Papanui Polamalu <papanuip@nrc.govt.nz>
**Subject:** RE: Waitangi Tsunami Siren location

Morena

I managed to discuss with Ngati Kawa at a tangi on Saturday.

Please proceed with the resource consent excluding the pou.

We do not have funding nor a carver available to do this mahi.

Let me know if you require hapu support for the RC.

Whati

**From:** Papanui Polamalu <papanuip@nrc.govt.nz>
**Sent:** Saturday, 17 January 2026 7:04 am
**To:** Whati Rameka <whati.rameka@tetiiwaitangi.co.nz>
**Subject:** Re: Waitangi Tsunami Siren location

Our condolences e te whānau, yes so many passings lately. Sorry for the inconvenience.

Very much appreciated  Whati

---

**From:** Whati Rameka <whati.rameka@tetiiwaitangi.co.nz>
**Sent:** Thursday, January 8, 2026 10:51:24 am
**To:** Papanui Polamalu <papanuip@nrc.govt.nz>
**Subject:** RE: Waitangi Tsunami Siren location

Tena koe Papanui

Nga mihi o te tau hou pakeha!

Just checking in whether this has been resolved?

I understand we had no issue on the location.

Whati

---

**From:** Papanui Polamalu <papanuip@nrc.govt.nz>
**Sent:** Thursday, 13 November 2025 11:55 am
**To:** Ngati Kawa Taituha <ngatikawat@gmail.com>; Hama Apiata <hama.waitangi@gmail.com>; Isaiah.apiata@gmail.com; George Riley <george.r@tetiiwaitangi.co.nz>; Whati Rameka <whati.rameka@tetiiwaitangi.co.nz>; Dr Mary-Anne Baker <maryanne@tetiiwaitangi.co.nz>; Bill Tane <chairperson@oromahoetrust.co.nz>; Richard Takimoana <richardtakimoana@waitangi.org.nz>; Merata Kawharu <merata.kawharu@gmail.com>; Hirini Tane <hirini.tane@gmail.com>; Mutunga Rameka <mutungaramekanr@gmail.com>
**Cc:** Bill Hutchinson <billh@nrc.govt.nz>; Brendon Gray <brendon.gray@nrc.govt.nz>
**Subject:** Waitangi Tsunami Siren location

Tēnā koutou katoa,

E pehea ana koutou? I hope this email finds everyone safe and well.

I apologise for the inconvenience,  but we are still trying to get the resource consent through the process for the Tsunami siren in Paihia.  To get the consent through with the Pou attached, we do need some information about the Pou.

Firstly we totally support the adding of your Pou on the siren, but are you able to share dimensions, the colour scheme and any design details you're allowed to give us?

Here are some details of the Tsunami Siren:

- 2.7m2 concrete foundation to support a
- 8m steel pole (like a power pole)
- A Siren which is approximately 1.15m high
- Two x 100w solar panels
- Control box

*(This is the same model as the one to be placed at Waitangi)*

Unfortunately there are some of the considerations that need to be added to the resource consent.

- The colours, these sirens have a strict colour code so adding the colour of the Pou is required for the application.
- The size, which is to ensure we don't have an issue with the weight and wind loading effects where it could cause the siren to fall over.

The Pou would need to be built around the siren pole once it is in place. The process of erecting the poles is very cumbersome and putting a Pou onto the pole before construction would most likely cause significant damage to the piece of whakairo. The poles themselves take quite a bit of damage in the process and require some touch up work after construction, so a wooden poupou would be likely to suffer too much damage if we did it that way.

It also cannot be slid onto either end as the ends have large flanges on them. So, assembly after the pole is up would be the safest way to get it constructed.

If we need to have a kanohi ki te kanohi conversation or online hui please don't hesitate to contact myself or Brendon Gray.

Once again I apologise for the continued comms, and sorry for the inconvenience and hope to hear from you soon.


Puketona Rd
Paihia, Northland Region
Google Street View
Sep 2024
See more dates
Park
Te Kemara Ave
Google

Tsunami Siren # 67
Siren Type: 293

Location: Te Karuwha Road Roundabout Roadside Reserve

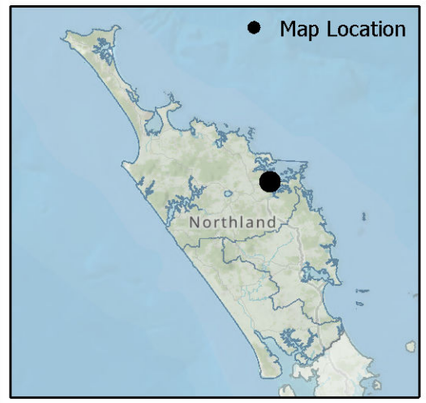
GPS: -35.277694, 174.082863

Property Owner: Far North District Council

Parcel ID: 5238333

Legal Desc: Road Reserve

Record of Title:



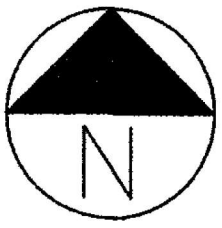

Data sources: Land Information New Zealand, Northland Regional Council
Imagery: Northland 0.3m Rural Aerial Photography 2023-2024

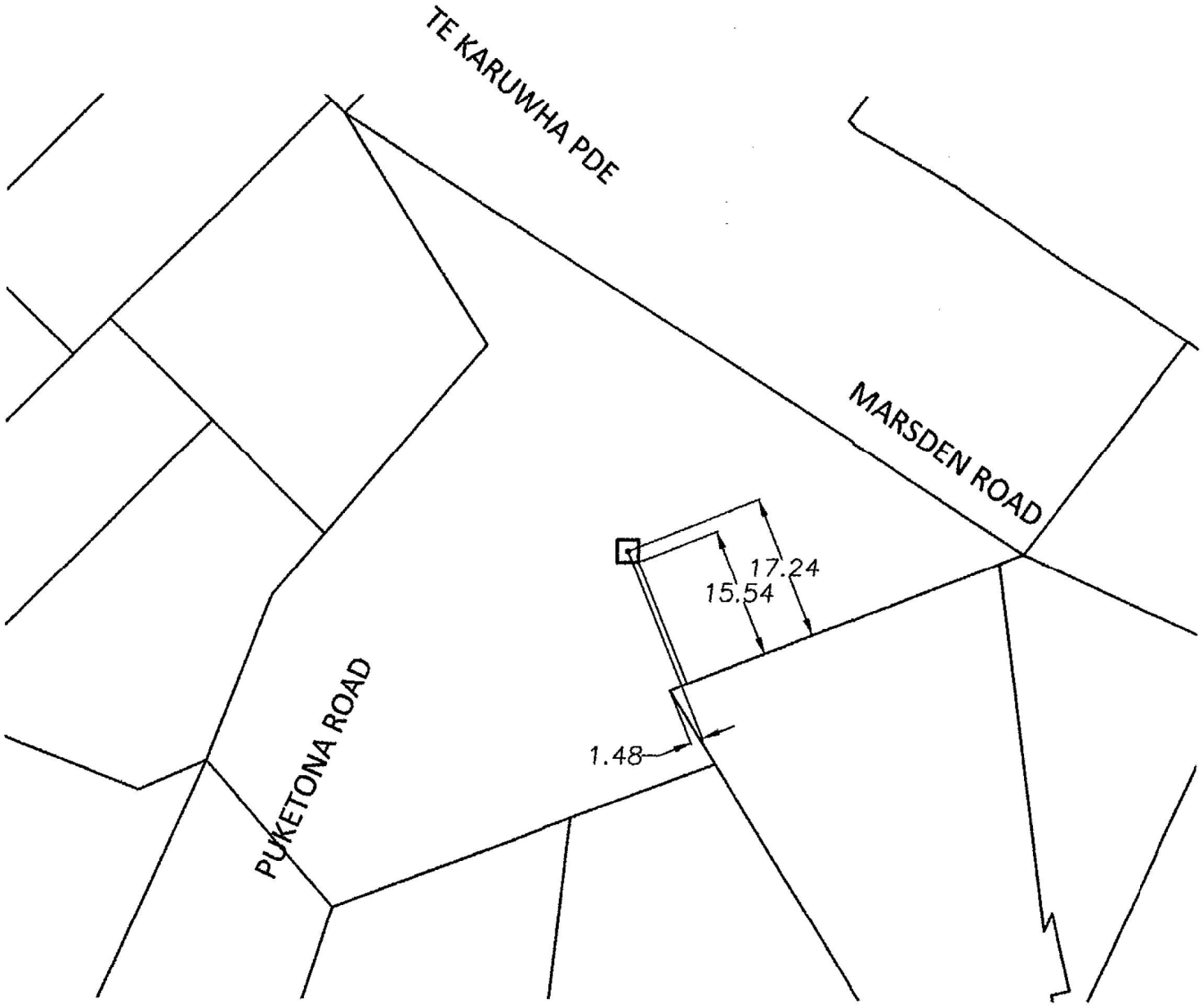
# Tsunami Siren # 67 - Te Tii Marae Waitangi

A3 Scale: 1:1,000

0 12.5 25 50 m

Updated by spatialize.co.nz on 5/06/2025




NOTE:

FOUNDATION PAD PLAN SIZE 2.5m BY 2.5m

OVERALL HEIGHTS:

TWS-293 SIREN MODULE 9.123m

TWS-295 SIREN MODULE 9.758M

# SITE NO 67- SIREN TYPE TWS-293
# TE KAHUWHA PARADE ROUNDABOUT ROADSIDE RESERVE
# GEOLOCATION -35.277694N, 174.082863E

TUTUKAKA CONSULTANTS LIMITED
Consulting Engineers
50 Taonga Lane, Tutukaka
Whangarei 0173
Phone (09) 434 3694, 0221 880 870
E-mail: wayne@tutukakaco.com

client: NORTHLAND REGIONAL COUNCIL

location: FAR NORTH DISTRICT

project: NORTHLAND TSUNAMI SIREN NETWORK

drawing title: RESOURCE CONSENT STAGE 1 - SEPPARABLE PORTION 1

Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

SCALES: 1:1000

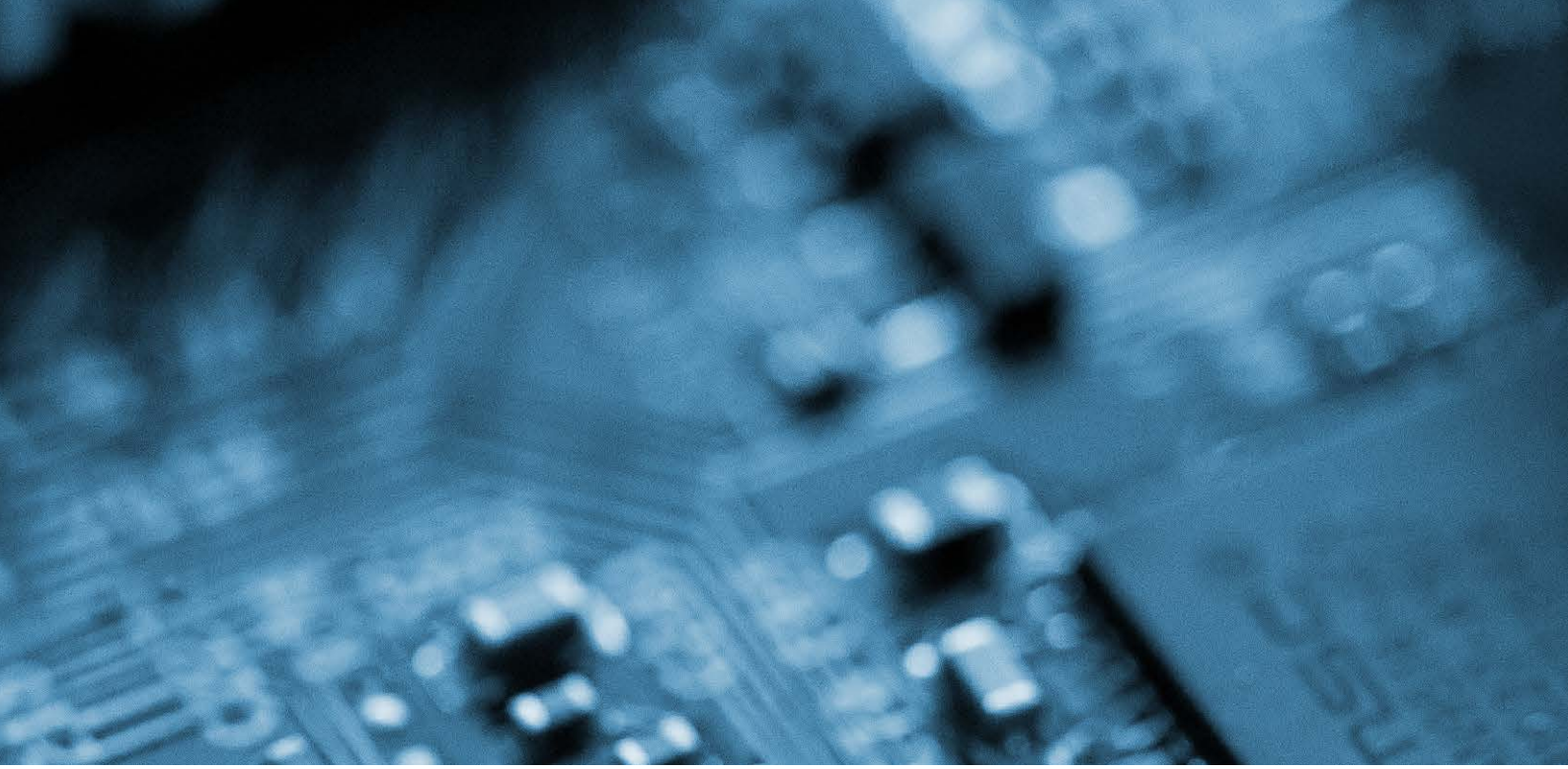
FILE: SIREN LOC up~east01
DATE: 07/23
ORIGINAL SIZE: A4

REVISIONS

| | |
|---|---|
| A | ISSUE FOR CLIENT APPROVAL |
| B | LOCATION CHANGED 20-8-24 |

DRAWING NUMBER 231203/08

REVISION: B



**Project:**

**Northland Regional Council**

May 31, 2021

# DATASHEETS


Gabinete electrónico de dos compartimentos

HSS

ENGINEERING®

WARNING SYSTEM SOLUTIONS

*Las sirenas de la serie TWS-290 son las más confiables en el mercado para tonos de alerta y comunicación por voz*

# SIRENAS ELECTRÓNICA DE ALTO POTENCIA

## TWS-295

La combinación de potentes tonos de alarma de alta eficiencia y una transmisión de voz clara e inteligible garantiza una excelente advertencia durante cualquier emergencia. Esto permite al operador notificar y dirigir una advertencia a la población afectada. Con un diseño superior del grupo de altavoces TWS proporciona una verdadera salida de sonido de 360 ° en todo el rango de frecuencias. La serie TWS-290, con sus amplificadores de alta eficiencia y Los controladores de altavoz duraderos EZ-PULL™ pueden proporcionar advertencia continua durante un mínimo de 30 minutos a plena potencia de salida, únicamente con la energía de la batería. Todos los componentes electrónicos están integrados en un gabinete de aluminio resistente a la corrosión de alta calidad.

### CARACTERÍSTICAS

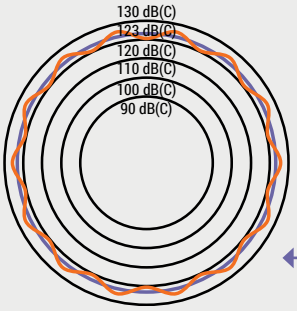
- 5 Modulos omnidireccionales de altavoces ensamblados en una columna vertical
- Gabinete de aluminio con clasificación IP66 con compartimiento de batería separado
- SPL 123 dB(C) @ 100' / 30 m
- El altavoz TWS-295 incluye 5 speakers drivers EZ-PULL™ de alta eficiencia
- Amplificador y transductores de sonido de calidad superior
- Cable de altavoz de 15 metros incluido
- Alimentado por batería, un mínimo de 30 minutos de potencia total con baterías de nuestra recomendación
- Cargador baterias, conmutación por 3 etapas compensada por temperatura
- Controles locales o controles remotos
- 5 Amplificadores de potencia de alta eficiencia
- Controlador de sirena electrónico con SI TEST® - Autocomprobación / diagnóstico silencioso
- Generador de tonos de alarma, transmisión de voz automática y en vivo
- Monitoreo de estado completo que incluye alarma de batería baja, estado del amplificador / altavoz
- Pararrayos de CA incluido (pararrayos de antena incluido con opción TWS-RADIO)
- Seis tonos de advertencia estándar – Wail, Whoop, Attack, Hi-Lo, Alert, Airhorn
- Tonos de advertencia personalizados opcionales
- Tipo de amplificadores Clase D
- Fabricado en polímero de carbono reforzado con fibra no corrosivo. Material no metálico
- Índice de inteligibilidad de STI 0,99. Capacidad de voz clara con respuesta de frecuencia de alta calidad

## RENDIMIENTO ACÚSTICO

| | |
|---|---|
| **SPL @ 1 metro:** | 153 dB(C) |
| **SPL @ 30 metros:** | 123 dB(C) |
| **70dB rango ISO 13475-1*:** | 14,320 m |
| **70dB rango estándar FEMA**:** | 1,280 m |

* ISO: Reducción de la presión acústica de 6 dB pr. duplicación de la distancia (según ISO 13475-1)

** FEMA: Reducción de presión sonora de 10 dB pr. duplicación de la distancia (según las pautas de FEMA)




El diseño superior del grupo de altavoces proporciona una verdadera salida de sonido de 360 ° en todo el rango de frecuencias. SPL +/- 1 dB de disminución en 360º

## CONDICIONES DEL ENTORNO

| | |
|---|---|
| **Temperatura de operación** | -35° C a + 70° C |
| **Temperatura de almacenamiento** | -65° C a + 125° C |
| **Humedad no condensada** | 0 to 95 % |

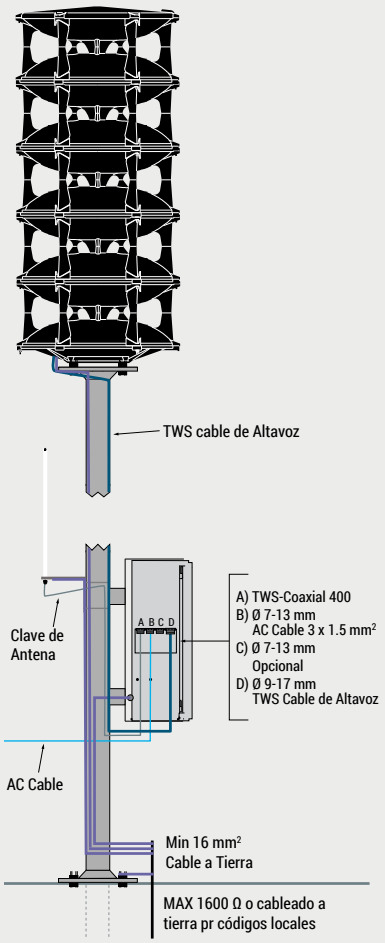
## ELECTRÓNICA DEL SISTEMA

| | |
|---|---|
| **Alimentacion de entrada a cargador de batería** | 120/240 VCA o 50/60 Hz |
| **Salida de cargador de batería** | 28 VDC, 10A # |
| **Baterías** | 2 unidades, cada una con 12 V, AGM sellada. 100 AH. consumo en funcionamiento |
| **Consumo en Standy** | 82 mA, 24 VDC |
| **Corriente de Funcionamiento** | 111 A, 24 VDC |
| **Potencia de salida por transductor** | (típica / máxima) 400 Watts / 600 Watts |
| **Potencia de salida total** | (típica / máxima) 2000 Watts / 3000 Watts |

# U.L. Componente Reconocido

| **Componentes** | **Altura** cm (pulgadas) | **Ancho** cm (pulgadas) | **Fondo** cm (pulgadas) | **Peso** kg(lbs) |
|---|---|---|---|---|
| **TWS-295 Speaker** | 178,8 (70,4) | 84,8 (33,4) | | 137,5 (303) |
| **Gabinete Electrónico** | 84,5 (33,3) | 58,0 (22,8) | 35,0 (13,8) | 43,0 (94,9)* |

* Menos baterías. Dos baterías: 12 V, selladas. Calcio – Plomo, 24 kg adicionales por batería. No kit de radio. Si se selecciona esta opción adicionar 2.5 kg.




## INFORMACIÓN PARA LA ORDEN

| **Descripción del producto** | **Orden No.** |
|---|---|
| Conjunto de altavoces y gabinete de electrónica | TWS-295 |
| **Opciones** | |
| Placa de control de estado / activación auxiliar para contacto Activación y estado de cierre | AUXCS |
| Placa de activación auxiliar para cierre de contacto | AUXIN |
| Unidad de fuente de alimentación directa de AC de alta eficiencia | TWS -AC-PCU |
| Módulo GSM | GV-GSM-RTU |
| Ethernet control / status interface | GV-IP |
| Control de estado / control de línea bidireccional de Giant Voice® | GV-LLM |
| Radios con opciones analógicas o digitales con amplio rango de frecuencia dentro de VHF y UHF | TWS-RADIO |
| Alerta visual omnidireccional | TWS-VISUALERT |
| Luz estroboscópica montada en celda superior | TWS-TL31R |
| Interfaz de Giant Voice® a interfaz Whelen Tonos con Sistema PAGA existente | GV-PGINT |
| Alarma de Intrusión | TWS INTRU |
| Alimentacion fotovoltaica/Solar | TWS-SBC200 |
| Par de baterías (2 pcs) | TWSBATT |
| Escudo Solar para Gabinete Electrónico | TWS SUN SHIELD |
| Tonos de alerta personalizados | GV-TONES |

REV. C

HSS Engineering A/S
Laegaardsvej 12 · 8520 Lystrup · Denmark
Phone + 45 7022 8844
www.hss.dk · info@hss.dk

HSS
ENGINEERING®
WARNING SYSTEM SOLUTIONS


*Two compartment electronics cabinet*

HSS ENGINEERING®
WARNING SYSTEM SOLUTIONS

*The TWS-290 siren series is the most reliable warning siren system on the market for both warning tones and voice communication*

# ALL HAZARD HIGH-POWER SIREN SYSTEM

## TWS-293

The combination of powerful high efficiency alarm tones and clear, intelligible voice broadcast ensures an excellent warning during any emergency. This enables the operator to notify and direct a warning to the affected population. The superior design of the TWS speaker cluster provides a true 360° sound output throughout the entire frequency range. The TWS-290 series, with its high-efficiency amplifiers and durable EZ-PULL™ speaker drivers, can provide continuous warning for a minimum of 30 minutes at full output power, solely from battery power. All electronics are built into a high-quality corrosion resistant aluminum cabinet.
This makes the TWS-290 siren series the preferred Mass Notification Solution by our customers worldwide.

### FEATURES

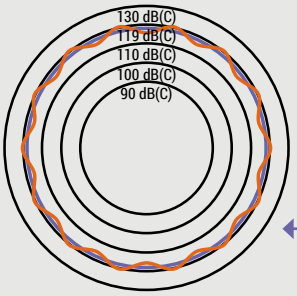
- 3 omni-directional speaker cells assembled in a vertical column
- IP 66 rated aluminum cabinet with separate battery compartment
- 119 dB(C) @ 100' / 30 m
- TWS-293 speaker includes 3 pcs high efficiency EZ-PULL™ speaker drivers
- 600 Watts per speaker driver rated max. output power for superior durability
- 15 m speaker cable included
- Battery powered, minimum of 30 minutes of full power output with batteries of our recommendation
- Temperature compensated 3-stage switch mode battery charger
- Local or remote control / status
- 3 pcs high efficiency power amplifiers
- Electronic siren controller featuring SI TEST® - Silent self-test / diagnostics
- Alarm tone generator, automatic and live voice broadcast
- Full status monitoring including low battery alarm, amplifier / speaker status
- AC lightning arrestor included (antenna lightning arrestor included with TWS-RADIO option)
- Six standard warning tones – Wail, Whoop, Attack, Hi-Lo, Alert, Airhorn
- Optional customized warning tones

## ACOUSTIC PERFORMANCE

| | |
|---|---|
| **SPL @ 1 m:** | 149 dB(C) |
| **SPL @ 30 m:** | 119 dB(C) |
| **70dB range ISO 13475-1*:** | 9,110 m |
| **70dB range FEMA standard**:** | 914 m |

* ISO: 6 dB sound pressure reduction pr. doubling of distance (as per ISO 13475-1)

** FEMA: 10 dB sound pressure reduction pr. doubling of distance (as per FEMA guidelines)




The superior design of the speaker cluster provides a true 360° high sound output throughout the entire frequency range.

## ENVIRONMENTAL

| | |
|---|---|
| **Operating temperature** | -35° C to + 70° C |
| **Storage temperature** | -65° C to + 125° C |
| **Humidity, non-condensing** | 0 to 95 % |

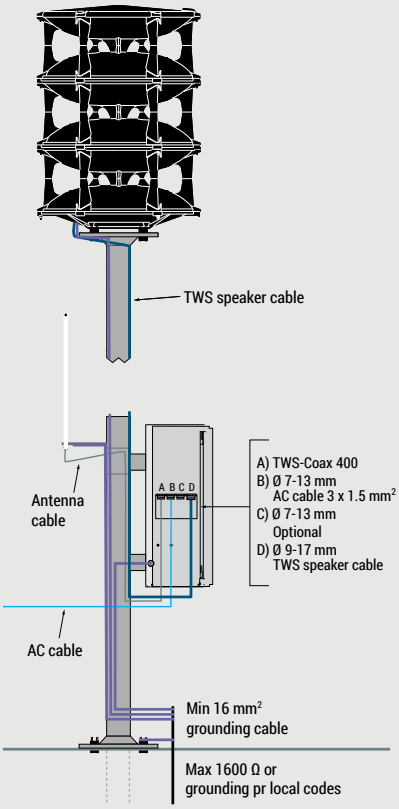
## ELECTRICAL

| | |
|---|---|
| **Battery charger input** | Option of 120/240 VAC or 50/60 Hz |
| **Battery charger output** | 28 VDC, 10A# |
| **Batteries** | 2 pcs 12 V, AGM sealed. 100 AH. Sold separately |
| **Standby current** | 82 mA, 24 VDC |
| **Operating current** | 23 A, 24 VDC |
| **Normal amplifier output power** | 400 Watts during tone / 500 Watts during voice |
| **Rated total max. output power** | 1800 Watts |

# U.L. recognized component

| **Component** | **Height** cm (inches) | **Width** cm (inches) | **Depth** cm (inches) | **Weight** kg (lbs.) |
|---|---|---|---|---|
| **TWS-293 speaker** | 115.3 (45.4) | 84.8 (33.4) | | 93 (205) |
| **Electronics cabinet** | 84.5 (33.3) | 58.0 (22.8) | 35.0 (13.8) | 36.4 (80.1)* |

* Less batteries. Two batteries: 12 V, sealed, lead-calcium, add 24 kg pr. battery.
Less optional radio kit. Add 2.5 kg, if this option is selected.




## ORDERING INFORMATION

| **Product Description** | **Order No.** |
|---|---|
| Speaker assembly and electronics cabinet | TWS-293 |
| **Options** | |
| Auxiliary activation / status control board for contact closure activation and status | AUXCS |
| Auxiliary activation board for contact closure | AUXIN |
| High efficient AC direct power supply unit | TWS-AC-PSU |
| GSM module | GV-GSM-RTU |
| Ethernet control / status interface | GV-IP |
| Giant Voice® Two way landline control / status monitoring | GV-LLM |
| High standard radios in both analogue and digital versions with wide frequency range within both VHF and UHF | TWS-RADIO |
| Omni-directional visual lighting | TWS-VISUALERT |
| Top mounted strobe light | TWS-TL31R |
| Giant Voice® Paging interface to interface TWS warning with existing paging systems | GV-PGINT |
| Intrusion alarm | TWS-INTRU |
| Solar power | TWS-SBC100 |
| Two pairs of batteries | TWSBATT |
| Sun shield for electronic cabinet | TWS SUN SHIELD |
| Customized warning tones | GV-TONES |

REV. H

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HSS ENGINEERING®
WARNING SYSTEM SOLUTIONS

Three things you need to know in order to save lives

# ALERT INFORM DIRECT

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## Standard tones

# IT'S IMPORTANT THAT THE PRODUCT YOU CHOOSE SOUNDS RIGHT

**Comes with six standard warning tones**

| Tone | Tone symbol | Frequency | Period of time |
|---|---|---|---|
| Wail |  | 410-675 Hz | 4 sec / 1 sec |
| Alert |  | 560 Hz | Steady |
| Hi/Lo |  | 465/650 Hz | 8 sec / 8 sec |
| Attack |  | 410-490 Hz | 1 sec / 1 sec |
| Air Horn |  | 465-650 Hz | Modulated / 1.6 sec |
| Whoop |  | 300-465 Hz | 3 |

### THIS IS WHAT YOU GET

- **Minimized cost of services and maintenance during the systems life span.**
- **Less power consumption (therefore greater energy autonomy and less accumulation of heat in the electronic components of the system).**
- **Working 24 / 7 / 365 (No need for thermal auto shutdown during vital emergencies).**
- **Lower weight and height give less wind load, smaller mast and lower installation costs.**
- **Comes with the most powerful speaker drivers in the market.**
- **Greater reliability thanks to important components such as amplifiers, drivers and batteries.**

# Weights and measures

TWS-291 TWS-292 TWS-293 TWS-294 TWS-295 TWS-296 TWS-297 TWS-298 TWS-299 TWS-2910

| Modelo | SPL @ 1 m | SPL @ 30 m | System wattage Audio tone | Voice audio | Hight cm (inches) | Width cm (inches) | Weight kg (lbs.) |
|---|---|---|---|---|---|---|---|
| **TWS-291** | 139 dB(C) | 109 dB(C) | 400 | 500 | 51.8 (20.4) | 84.8 (33.4) | 48.6 (107) |
| **TWS-292** | 145 dB(C) | 115 dB(C) | 800 | 1000 | 83.6 (32.9) | 84.8 (33.4) | 70.8 (156) |
| **TWS-293** | 149 dB(C) | 119 dB(C) | 1200 | 1500 | 115.3 (45.4) | 84.8 (33.4) | 93 (205) |
| **TWS-294** | 151 dB(C) | 121 dB(C) | 1600 | 2000 | 147.1 (57.9) | 84.8 (33.4) | 115.3 (254) |
| **TWS-295** | 153 dB(C) | 123 dB(C) | 2000 | 2500 | 178.8 (70.4) | 84.8 (33.4) | 137.5 (303) |
| **TWS-296** | 155 dB(C) | 125 dB(C) | 2400 | 3000 | 210.6 (82.9) | 84.8 (33.4) | 164.2 (362) |
| **TWS-297** | 156 dB(C) | 126 dB(C) | 2800 | 3500 | 242.3 (95.4) | 84.8 (33.4) | 186.5 (411) |
| **TWS-298** | 157 dB(C) | 127 dB(C) | 3200 | 4000 | 274.1 (107.9) | 84.8 (33.4) | 208.7 (460) |
| **TWS-299** | 158 dB(C) | 128 dB(C) | 3600 | 4500 | 305.8 (120.4) | 84.8 (33.4) | 230.9 (509) |
| **TWS-2910** | 159 dB(C) | 129 dB(C) | 4000 | 5000 | 337.6 (132.9) | 82.5 (32.5) | 253.1 (558) |

| Cabinets | Hight cm (inches) | Width cm (inches) | Depth cm (inches) | Weight kg (lbs.) |
|---|---|---|---|---|
| **Electronics cabinet**** (TWS-291-295) | 84.5 (33.3) | 58.0 (22.8) | 35.0 (13.8) | _* |
| **Electronics cabinet**** (TWS-296-2910) | 169.0 (66.6) | 58.0 (22.8) | 35.0 (13.8) | _* |

* Less batteries. Two batteries: 12 V, sealed, lead-calcium, add 24 kg pr. battery. Less optional radio kit. Add 2.5 kg, if this option is selected. Weight depends on model siren, verify weight in the technical data sheet of the specific equipment.

** Equipment is configured for 120 Vac input power. Other input Voltages supplied upon request.

# DESIGN – TOWER AND MAST

In accordance with local regulations and standards

**SIMPLE DESIGN**

**EASY TO INSTALL**

# ACCESSORIES FOR THE TWS-SERIES

## SOLAR POWER SYSTEM - DESIGNED FOR HARSH ENVIRONMENTS

The TWS-SBC200 is an all-inclusive solar power supply solution engineered to meet the power requirement of a TWS-Siren or Giant Voice® PA/GA system. High quality components and UV resistant cabling ensure years of performance even in harsh environments. Solar panels with tempered glass and excellent low light power output combined with 3-Stage intelligent PWM charging ensure high efficiency charging performance. Simple yet flexible aluminium mounting bracket for easy panel angling and installation.

## HIGH INTENSITY VISUAL ALERT SUPER-LED VISUALERT

## VISUAL LED WARNING

Enhance your Voice and Siren Mass Notification System with an optional visual component: The omni-directional visual lighting for TWS-290 & OA Series.

- VisuAlert Super-LED® mounts under a TWS-290 or omni-alert system
- Complete 360° highly effective LED warning
- VisuAlert illuminates with a designed flash pattern when siren is activated
- Cluster of six LED Whelen M6 Series warning lightheads, 24 VDC
- Bracket supports are 300 Series aluminium alloy in a high strength
- All connections are waterproof

TWS-290 Series. Mass notification solution

# TWS-SERIES HAS THE BEST PERFORMANCE IN THE MARKET

**SPECIALISTS IN CUSTOMIZED WARNING SYSTEM SOLUTIONS**

## PERFORMANCE

- Maximum acoustic and energy performance
- Highest SPL sound output compared to power consumption
- True 360° omnidirectional sound propagation without any acoustic shadows
- Proven MTBF of more than 30,000 hours
- Lowest maintenance and service requirements
- Modular design made of robust fiber-reinforced polycarbonate
- High efficiency EZ-PULL™ speaker drivers
- Normal amplifier output power 400 Watts during tone / 500 Watts during voice
- Rated total max. output power 600 Watts total capacity per amplifier
- Intelligible pre-recorded or live voice messages in a wide area
- STI intelligibility index 0.98
- A single amplifier for each high efficiency speaker driver
- Tested for decades in all types of climate and environments with success

## COMMUNICATIONS

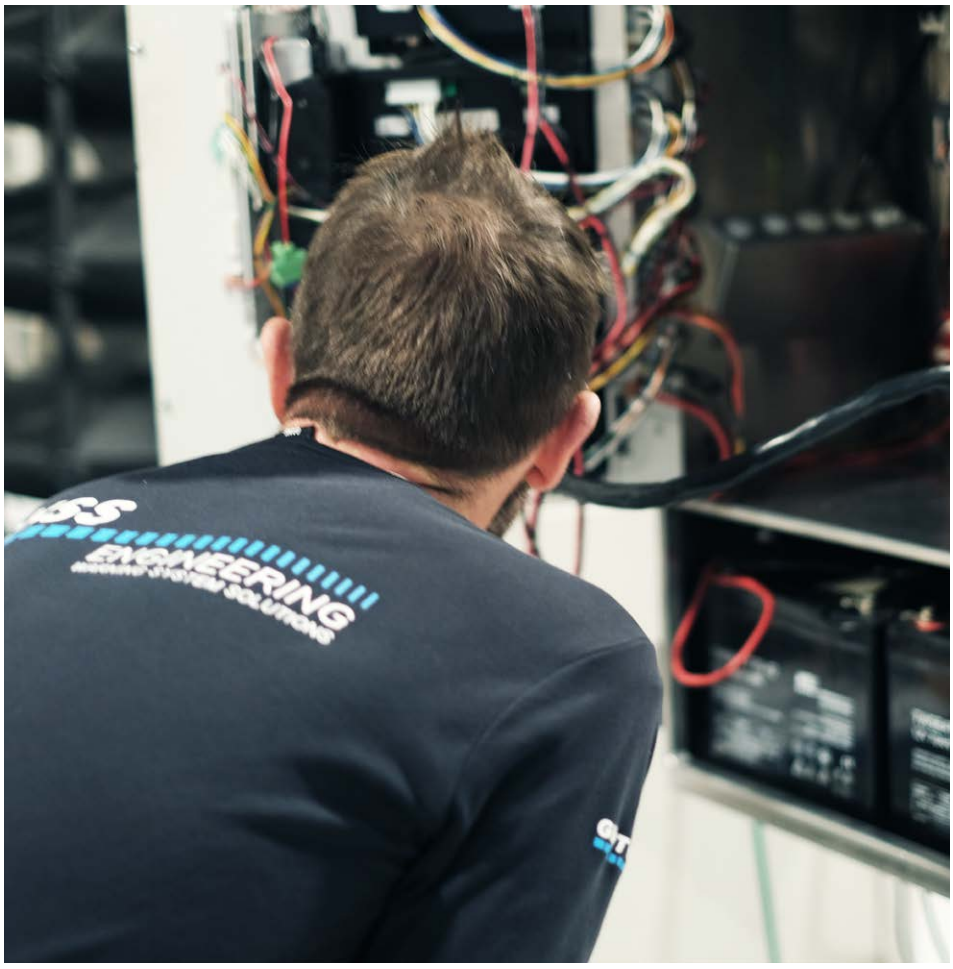
- Multiple technologies
- Simple or redundant
- VHF UHF digital radio
- Radio trunking
- GPRS 3G 4G
- Satellite BGAN M2M
- Broadband Networks
- IP Ethernet / Fiber Optic

## POWER

- Operation with AC, DC or solar energy
- Less power consumption = greater autonomy in emergencies
- Less excess heat in the electronics cabinet
- Minimum autonomy 30 minutes of continuous activation
- No need for thermal auto shutdown during vital emergency alerts
- Separate ventilated battery compartment

TWS-290 Series cabinet

# A RELIABLE, LOW COST WARNING AND INFORMATION SYSTEM






## PERFORMANCE

- Maximum acoustic performance
- Six standard public warning tones - Wail, Whoop, Attack, Hi-Lo, Alert, Airhorn
- SI TEST®
- Lightning arrestor / Intrusion alarm
- Tone generator / Timer function
- Public address capability
- Local controls and/or remote controls

## DESIGN

- Two compartment natural finish aluminum cabinet with battery tray
- Battery switch
- Electronic siren controller
- Robust and light weight
- Lower weight and height
- Less wind load
- Easy to install
- High quality IP66 electronics cabinet

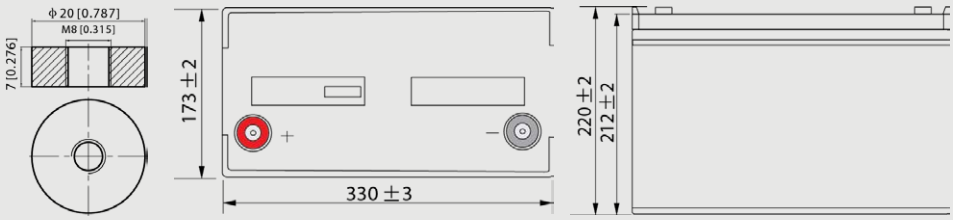

*A 12 V valve-regulated lead-acid (VRLA) battery for the TWS-290 Public Warning System*

# TWS BATTERY 100-12

## TWSBATT 100-12

### TECHNICAL DATA

| | | |
|---|---|---|
| **Nominal voltage** | 12 V | |
| **Nominal capacity (10HR)** | 100 AH | |
| **Dimensions** | Length:<br>Width:<br>Container height:<br>Total height: | 330 mm (12.99")<br>173 mm (6.81")<br>212 mm (8.35")<br>220 mm (8.66") |
| **Weight** | Approx. 28.5 kg (62.8 lbs.) | |
| **Terminal size** | Ø 8 mm | |

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# DISASTERS HAPPEN, BE PREPARED

## TRANSPORT INFORMATION

**UN No:** 2800

**Package group:** III

**IATA:** Not restricted for air transport-complies Special Revision A67

**IMO:** Not classified as of 1922

**Required Label** NON-SPILLABLE

Unrestricted U.S.A. shipment. Complies with IATA/ICAO Special Provision A67 for air transport. Recognized by DOT as "Dry Charge" 49 CFR 171-189 for surface transport. Classified per MG Amendment 27 as a non-hazardous material for water transport.

## TECHNICAL DATA

| | |
|---|---|
| **Terminal** | M8 |
| **Container material** | ABS |
| **Rated capacity** | 100.0 AH / 10.0 hr (10 hr, 1.80 V/cell, 25° C / 77°F) |
| **Max. discharge current** | 1200 A (5s) |
| **Internal resistance** | Approx. 4.8 mΩ |
| **Temp. range** | Standard operating: -15–50° C (5–122°F) When paired with our temp. compensating charger TWS-BATTCH: Extended Operating: -35–60° C (-31–140°F) |
| **Cycle use** | Initial Charging Current less than 30.0 A. Voltage 14.4 V–15.0 V at 25° C (77°F) Temp. Coefficient -30 m V/° C |
| **Standby use** | No limit on Initial Charging Current Voltage 13.5 V–13.8 V at 25° C (77°F) Temp. Coefficient -20 mV/° C |
| **Capacity affected by temperature** | 40° C (104°F) 25° C (77°F) 0° C (32°F) 103% 100% 86% |
| **Self-discharge** | TWSBATT 100-12 batterys may be stored for up to 6 months at 25° C (77°F) before a recharge is required. For higher temperatures the time interval will be shorter. |

## ORDERING INFORMATION

**Product Description**
TWS Battery AGM 12 V 100 Ah
**Order No.**
TWSBATT 100-12

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*Solar power system designed for harsh environments*

# SOLAR POWER SYSTEM

## TWS-SBC200

The TWS-SBC200 is an all-inclusive solar power supply solution engineered to meet the power requirement of a TWS-Siren or Giant Voice® PA/GA system. High quality components and UV resistant cabling ensure years of performance even in harsh environments. Solar panels with tempered glass and excellent low light power output combined with 3-Stage intelligent PWM charging ensure high efficiency charging performance. Simple yet flexible aluminium mounting bracket for easy panel angling and installation.

### FEATURES

- Panel performance guarantee, 90% for 10 years & 80% for 25 years
- Panels with tempered glass and class A cells with + 3% plus tolerance
- Panels feature bypass diodes for shadow optimization at serial connection
- 3-Stage intelligent PWM charging, bulk, boost/equalize, float
- Battery status LED indicator
- Extensive electronic protection – over voltage, over discharge, reverse polarity etc.
- Mounting bracket made of EN AW-5754 aluminium ensures extremely high corrosion resistance
- Solar feed cable featuring MC4 connectors is Weather/UV-resistant acc. to HD 605/A1, halogen-free and flame-retardant

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# DISASTERS HAPPEN, BE PREPARED

## ORDERING INFORMATION

**Product Description**
Solar power system 2 x 12V
100 Watt panels
**Order No.**
TWS-SBC200

REV. E

## TECHNICAL DATA PER SOLAR PANEL

| | |
|---|---|
| **Power** | 100 Watt* |
| **Panel voltage** | 12 Volt |
| **Number of bypass diodes** | 2 pcs. |
| **Max. power current** (Imp) | 5.68 A |
| **Open circuit voltage** (Voc) | 21.6 V |
| **Short circuit current** (Isc) | 6.14 A |
| **Max power tolerance** | -/+ 3% |
| **Dimensions** (pr. panel) | Width: 1200 mm (47,24")<br>Height: 540 mm (21,26")<br>Depth: 35 mm (1,37") |
| **Panel weight** (pr. panel) | 8.2 kg |

## INCLUDES

- 2 x 100 Watt* solar panels
- PWM solar charge controller
- TWS/GV power supply interface
- Mounting bracket for solar panels (weight 9.1 kg)
- Siren controller interface cable
- 15 meter solar feed cable

* Solar panels can be with higher power output for customer requirements.

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GIANT VOICE®

EMERGENCY SYSTEMS


*Basic unit incl. GV-EMS software*

# CORE UNIT

## GV-CORE-RM3

The Giant Voice® Core Unit serves as the integration platform for Giant Voice® products as well as auxillary components. It connects directly to the Giant Voice® Distributed Communication Network (GV-DCN). All components are chosen to ensure the highest reliability reducing maintenance to a minimum.

The Giant Voice® Core Unit features a multi I/O communications interface, which enables easy connection and control of classic analogue DTMF systems as well as digital radios, PA-microphone, LAN and fibre etc. Moreover, it has a built-in audio distribution interface, which provides connection to devices such as CD-Players, PA systems etc. and from here distributed throughout the control interface.

The built-in dual voltage 115/230 VAC power supply combined with the multi I/O communications interface ensures a high level of flexibility for installation.

### FEATURES

- Highly Versatile Communications Interface
- Advanced siren system fault monitoring and control features via GV-EMS software
- Backwards compatible TWS, Giant Voice and Whelen DTMF Control Interface
- Dual Voltage 115/230 VAC
- 19" 3U cabinet design
- CD-Players, PA systems etc distributed throughout the control interface
- Components chosen to ensure the highest reliability

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# GIANT VOICE®

EMERGENCY SYSTEMS

## ALERTS PEOPLE TO POSSIBLE DANGER

## ORDERING INFORMATION

**Product Description**
Core Unit
**Order No.**
GV-CORE-RM3

**Product Description**
Giant Voice® EMS
**Order No.**
GV-EMS

**Option**

**Product Description**
Telecom System Interface
**Order No.**
GV-PABX-A (Analogue)
GV-PABX-D (Digital)

REV. C

## TECHNICAL DATA

| | | |
|---|---|---|
| **DTMF Port** | 1 | |
| **Digital Communications Port** | 1 | |
| **Optional/Audio Port** | 1 | |
| **LAN Ports** | 2 | |
| **Display Port** | 1 | |
| **DVI-I** | 1 | |
| **COM Ports** | 2 | |
| **USB Ports** | 7 | |
| **PABX Expansion Slots** | 1 | |
| **Operating temperature** | -10° C – +60° C | |
| **Dimensions** | Width:<br>Height:<br>Depth: | 19" (48,26 cm)<br>3U<br>32,25 cm (12.69") |
| **Weight** | 5,35 kg | |
| **Dual Voltage** | 115/230 VAC | |
| **Max power consumption** | 100 Watt | |

## OPTIONS

| | |
|---|---|
| **GV-PABX-A** | Telephone Branch Exchange Interface-Analogue |
| **GV-PABX-D** | Telephone Branch Exchange Interface-Digital |

Please contact us for more details.

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EMERGENCY SYSTEMS

*A comprehensive and flexible emergency system*

# EMERGENCY MANAGEMENT SYSTEM

## GV-EMS

The system is scalable i.e., the user can access all data and information, or activate components on the system from any GV-CORE unit connected to the system.

The software can be operated from one or more screens displaying different menus simultaneously. Menus are predesigned for touch screen operation. The system can be configured to meet your specific needs, such as predefined warning tones, pre-recorded messages and sequences, as well as customer-selected maps of the area.

The GV-EMS is a comprehensive and flexible Emergency System providing easy and understandable information that enables the user to make the right decisions and to react within seconds.

The GV-EMS has been developed to meet the customers' need for precise and accurate information at hand, when vital decisions must be made.

The software is delivered preinstalled on the GV-CORE unit that serves as the platform for the Giant Voice® Distributed Communication Network (GV-DCN).

The system is easy to use with its straightforward logic - simply select the system components on the map and then choose your action from one of the on-screen menus.

You can also add predefined sequences to the system by assigning sequences to the programmable activation keys. A sequence is defined by any specific warning priority, such as an alert by tones and inform by a public announcement.

You will not encounter any language barriers and the user interface can be modified with easily recognizable icons and colors.

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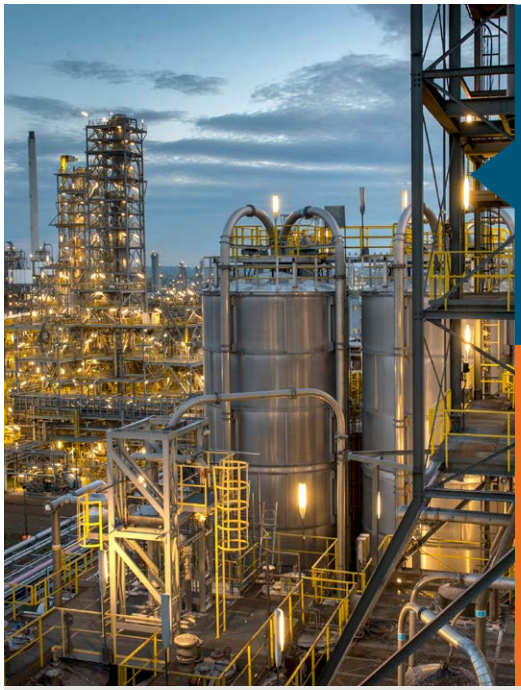

# GIANT VOICE®

EMERGENCY SYSTEMS

## ALERTS PEOPLE TO POSSIBLE DANGER

### INTEGRATION TO

- SCADA
- CCTV
- Fire System
- Warning Systems and more

### MAP FEATURES

- Zoom and pan capability
- Orientation map
- Predefined group selection
- Printable maps

### ACTIVATION FEATURES

- Activation of selected system components
- Activation status display
- Activation accept allows to preview the command before transmission

### SERVICE FEATURES

- Status data request from selected system components (for example: battery status, speaker driver or amplifier failure, AC Power, cabinet temperature)
- Real-time status monitoring

### ANALYSIS FEATURES

- User defined analysis criteria (Period, Selected Sirens, Command Type etc.)
- Data base of status logs with capability of storing information
- Export data function enabling export of selected data to e.g. Microsoft Excel

### FEATURES

- IP-Broadcast
- Unlimited amount of programmable predefined sequences
- Supports colour coded system components icon
- Configuration, monitoring and control capability of all system components in real-time
- Integration platform for a variety of components such as public address, general alarm sirens, PABX, sensors, strobe lights, text displays, SMS text message and more
- Individual Log-On ID supporting differentiation between operators, service personnel and administrators
- Supports GV-DCN network structure

### OPTIONS

- PABX Integration Additional screens
- 10 digit DTMF protocol
- Email Warning
- Giant Voice® Radio Base Station (UHF/VHF)
- Rack cabinet enclosure as pr. customer requirements
- SMS Warning

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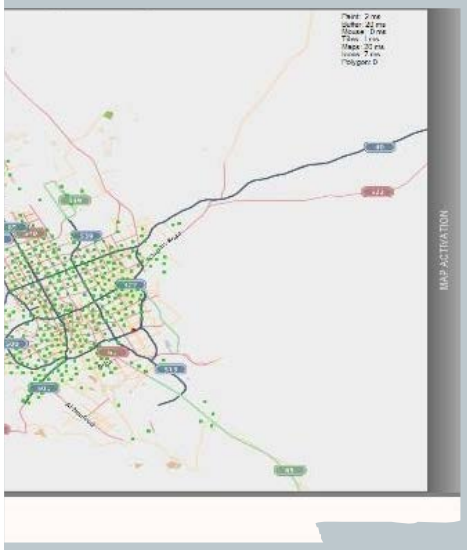

# GIANT VOICE®

EMERGENCY SYSTEMS

*A 19" touch screen for the Giant Voice® emergency management system*

# TOUCH SCREEN

## GV-TS19

The GV-TS19 Touch Screen is based on projected capacitive technology that, thanks to a glass overlay covering the screen, guarantees high durability, scratch-resistance and perfect picture performance. The touch function remains unaffected even if the glass is scratched.

A solid and steady base supports the Touch Screen with an adjustable stand offering full 90 degree positioning angles. Menu Buttons are located on the side of the screen, that can be locked to prevent tampering and includes a handy function to deactivate the Touch Screen for cleaning.

In addition, the edge-to-edge glass design creates an eye-catching finish, with high light transmission guaranteeing perfect picture clarity and brilliant colours. Analogue and Digital inputs are available for flexible connectivity along with a USB port for the Touch Interface.

### SPECIFICATIONS

| | |
|---|---|
| **Power supply** | AC 100 - 240 V, 50 / 60 Hz |
| **Power supply unit** | Internal |
| **Power consumption** | 25 W typical; max. 2 W in power management mode |
| **Power management** | VESA DPMS |
| **Analog input connector** | VGA |
| **Digital input connector** | HDMI<br>Display Port |
| **Inputs** | USB (for touch connectivity) |
| **Dimensions** | Width: 432 mm<br>Height: 391 mm<br>Depth: 219 mm<br>Weight: 6,9 kg |

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# GIANT VOICE®

EMERGENCY SYSTEMS

## ALERTS PEOPLE TO POSSIBLE DANGER

## ORDERING INFORMATION

**Product Description**
Giant Voice® 19" Touch Screen
**Order No.**
GV-TS19

**Options**

**Product Description**
Rackmount Bracket
for 19" Touch Screen
**Order No.**
GV-TSRMB

REV. F

## DISPLAY CHARACTERISTICS

| | |
|---|---|
| **Panel** | IPS LED |
| **Glass hardness** | 7H minimum |
| **Display area** | Height: 302.0 mm (11.89")<br>Width: 377.5 mm (14.86")<br>Response time 5 ms / 14 ms |
| **Contrast** | 1000: 1 with touch panel |
| **Brightness** | 225 cd/m² with touch panel |
| **Viewing zone** | Horizontal/vertical: 178°/ 178°<br>Right/left: 89°/ 89°; up/down: 89°/ 89° |
| **Display colour** | 16.7 million |
| **Pixel pitch** | 0.2928 mm |
| **Native resolution** | 1280 x 1024 (1.3 megapixel) |
| **Horizontal sync** | 31 - 80 KHz |
| **Vertical sync** | 50 - 75 Hz |
| **Synchronization** | Separate Sync |
| **Aspect ratio** | 5 : 4 |
| **Light transmittance** | 90% |

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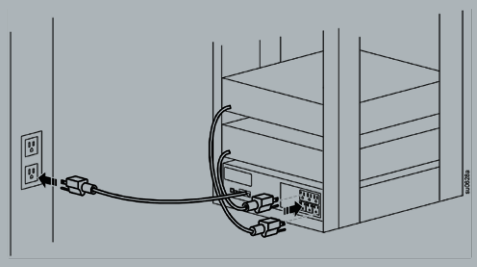
*Protect your Giant Voice® System from power outages*

**GIANT VOICE®**

EMERGENCY SYSTEMS



# UPS

## GV-UPS1500

The GV-UPS contains a battery pack that ensures operation of critical components in your PA/GA system in case of a power outage. The module is designed specifically for use together with the Giant Voice® PA/GA product range and is easily installed in racks along with these components.

The GV-UPS is equipped with 4 x IEC 230 VAC outlets and support loads 900 Watt. For extended battery capacity, more units can be added.

### FEATURES

- 2U rack case with rack rails
- 4 x IEC 230 VAC outlets
- Supports 900 Watt / 1500 VA
- True Sinewave output (THD<3%)
- High efficiency up to 92%
- Thermostatically controlled fan

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EMERGENCY SYSTEMS

## DISASTERS HAPPEN, BE PREPARED

## ORDERING INFORMATION

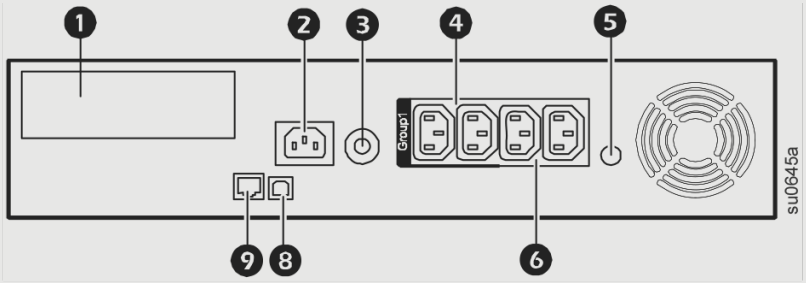
**Product Description**
1500 VA UPS
**Order No.**
GV-UPS1500

REV. E

## SPECIFICATIONS

| | |
|---|---|
| **Rated AC power output** | 900 Watt |
| **Number of 230VAC outlets** | 4 |
| **Transfer time** | 10 ms |
| **Power supply** | 230 VAC, 50/60 Hz |
| **Battery Volt-Amp-Hour capacity** | 336 |
| **Dimensions** | Width: 43.2 cm (17.0")<br>Height: 2U (8.6 cm)<br>Dept: 47.7 cm (18.8")<br>Weight: 28.6 kg |
| **Operating temperature** | 0 - 40° C |

1500 VA 230 VAC

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# GIANT VOICE®

EMERGENCY SYSTEMS

*The rack is a solution for your emergency warning system*

# RACK
## GV-RACK

The GV-RACK incorporates common features, such as adjustable 19-inch mounting angles and jacking feet, the GV-RACK range offers a configurable top panel system that provides an open base design to promote trouble free service and maintenance.

The GV-RACK is designed to provide the flexibility needed to suit all requirements of your Giant Voice® Emergency Management System. The rack can be fitted with options such as a top active fan and SMART UPS.

The GV-RACK is built to high quality standards.

### FEATURES

- Environmental protection rating IP20
- Adjustable 19-inch mounting rails
- Upgradable plain top panels
- Open base design
- Glazed front door and plain steel rear door
- Lockable lift off side panels
- Jacking feet fitted as standard
- Cable inlet apertures in both top and bottom
- Key lock on sides and rear. Key and handle lock on front

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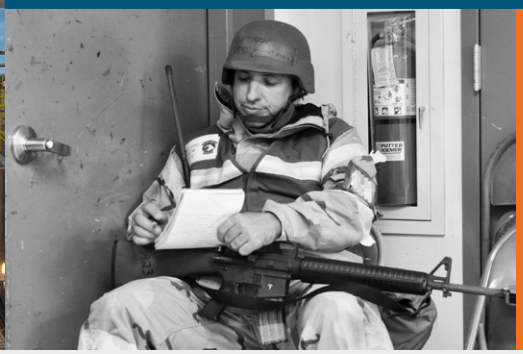
HSS ENGINEERING®
WARNING SYSTEM SOLUTIONS

# GIANT VOICE®

EMERGENCY SYSTEMS



# HSS ADVANCED WARNING SYSTEMS

## ORDERING INFORMATION

**Product Description**
RACK
**Order No.**
GV-RACK-15U
GV-RACK-22U
GV-RACK-36U
GV-RACK-42U

**Product Description**
Top active fan
**Order No.**
GV-RACK-FAN

**Product Description**
SMART UPS
**Order No.**
UPS 1500VA
UPS 3000VA*

* Requires a rack depth of 1000 mm
REV. F

## TECHNICAL DATA

| | | | | |
|---|---|---|---|---|
| **Air Flow** | 95 -115 CFM | | | |
| **Fan Speed** | 2700 - 3100 rpm | | | |
| **Noise level** | 44-49 db/A | | | |
| **Operating Voltage** | 220-240V, 50-60 Hz | | | |
| **Complies with** | IEC 297-1 | | | |
| **Dimensions** | **15 U** | **22 U** | **36 U** | **42 U** |
| Width | 600 mm | 600 mm | 600 mm | 800 mm |
| Height | 815 mm | 1120mm | 1728 mm | 2400 mm |
| Depth | 680 mm | 800 mm | 800 mm | 800 mm |
| **Color** | Light Grey NCS 1502-Y | | | |

## OPTIONS

- Smart UPS 1500 VA, 3000 VA*
- Other dimensions and colors are available on request

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HSS ENGINEERING®
WARNING SYSTEM SOLUTIONS

*Satellite & Cellular Communication Solutions*

GIANT VOICE®
EMERGENCY SYSTEMS

## DUAL MODE BGAN M2M

This terminal is the only Inmarsat BGAN M2M terminal to offer dual mode operation, which provides unique flexibility and M2M data communication cost-control, as it ensures the most cost effective communication service that can be chosen, depending on location.

Securing continuity of M2M IP data transfer, often originating in hard to reach, remote locations, dual-mode operation delivers significant fail-over capabilities with automatic switching between BGAN and cellular networks.

For organizations transferring critical real time data within their M2M networks, the dual mode can provide unmatched service availability. The terminal is well suited for bespoke M2M solutions such as IP SCADA for data backhaul, asset tracking, real time surveillance and remote telemetry.

# SATELITE SOLUTION

## Dual Mode BGAN M2M & Cellular terminal

## GV-SAT

HSS Engineering has designed a satellite & cellular communication solution ideal for monitoring, activation and interaction with the TWS Siren and GV-EMS systems. These systems function in areas with a lack of communication due to geographical conditions, using BGAN M2M technology terminal designed to operate on both Inmarsat BGAN (Broadband Global Area Network) and cellular 2G/3G/LtE networks. GV-SAT delivers continuous and reliable connectivity for critical monitoring and control applications.

BGAN M2M services use Inmarsat BGAN to provide a reliable, global, two-way IP data service. It is designed to connect monitoring and control applications in remote, unmanned locations, providing asset visibility and management control. By combining BGAN M2M with cellular connectivity in the same terminal, GV-SAT gives users the opportunity to choose the best carrier for any location.


GV-CORE

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HSS
ENGINEERING®
WARNING SYSTEM SOLUTIONS

# GIANT VOICE®

EMERGENCY SYSTEMS

## FEATURES

- GV-SAT is BGAN M2M certified and BGAN Class 2 Type Approved for services such as BGAN Link
- Lightweight and rugged IP66 design ensures durability for outside mounting - no enclosure needed
- Polemount included in the package
- Simple to set up and operate
- Versatile power options with both Power over Ethernet (PoE) and 10-32 VDC input
- Two cable glands for easy installation of standard power and Ethernet cables into the back housing
- Remote management of the terminal via SMS including configuration, debugging, and access to the web interface
- The optional cellular 2G/3G/LTE Modem is an integrated part of the design
- Automatic failover between BGAN and the cellular network ensures continuous connectivity
- Connectivity in North, Central & South America, Europe, Asia, Africa and more

## TECHNICAL DATA

| | |
|---|---|
| **Dimensions** (H x W x D) | Mainn Unit: 202 x 202 x 51.8 mm |
| **Weight** | Total: 1.4 kg |
| **Standard IP** | Up to 464 kbps |
| **Streaming IP** | 32, 64, 128 kbps (not in M2M mode) |
| **Connectivity** | 1 x Micro USB interface (for EXPLORER 3G modem)<br>1 x RJ45 Ethernet interface with PoE<br>1 x 8 pin Ethernet interface 1 x 3 pin for I/O<br>1 x 2 pin for DC power input |
| **Operating Temperature** | -40 °C – +75° C Storage |
| **Temperature** | -55 °C – +80° C Ingress Protection IP66 |
| **DC Input range** | 10.5-32 VDC Languages: ENG, FR, DE, ES, RU, JP and CN |
| **DC input range** | 10.5-32 VDC Pin Connector |
| **PoE input** | Poe+ IEEE 802.3 at Type 2 Class 4 via RJ45 Connector |

## ORDERING INFORMATION

**Product Description**
Giant Voice® Satelite Solution
**Order No.**
TWS-SAT

NOTE: The TWS-SAT Solution Frequency to be determined at order.
Please contact HSS Engineering for further information

REV. D

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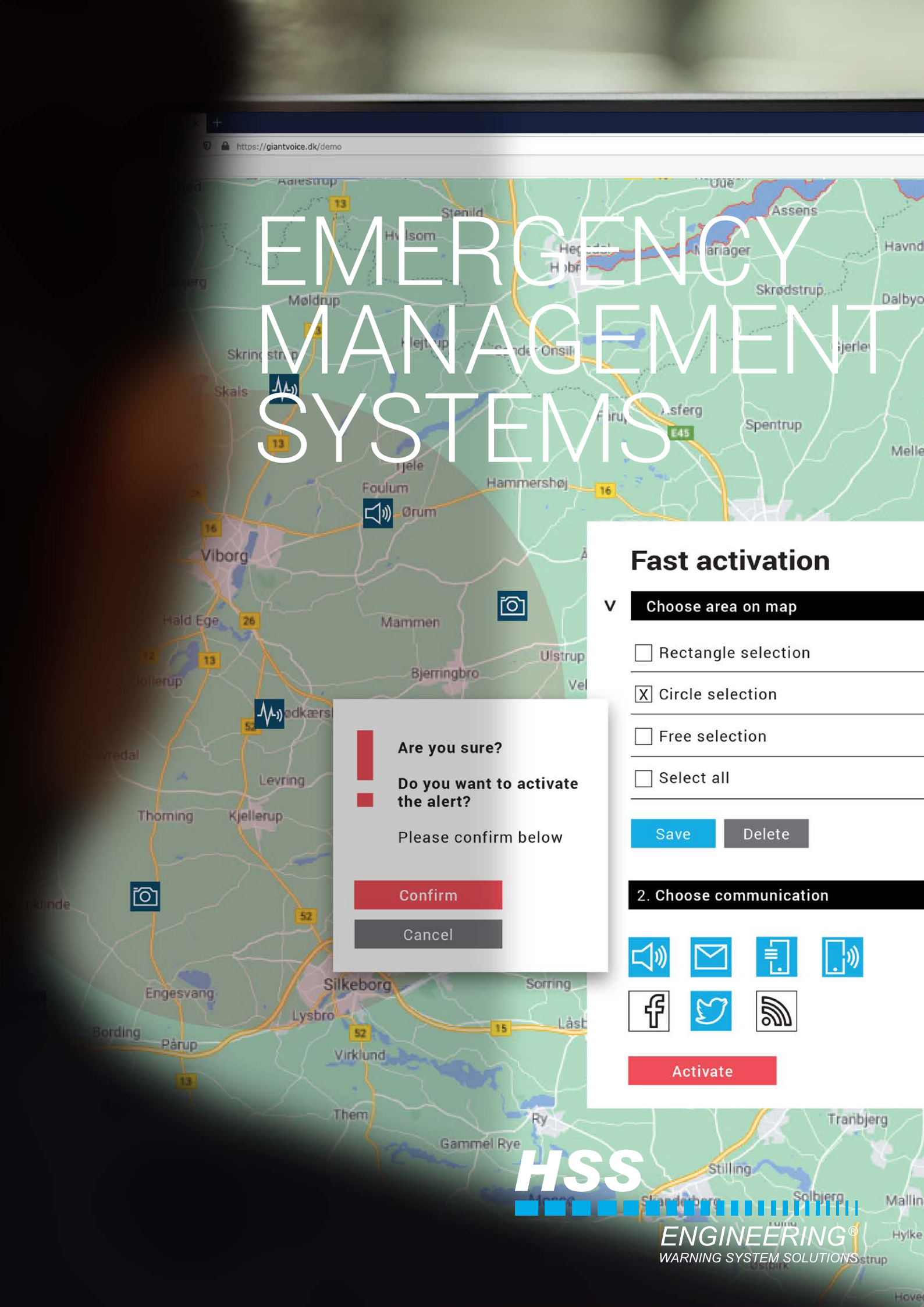
https://giantvoice.dk/demo
EMERGENCY MANAGEMENT SYSTEMS
Fast activation
Choose area on map
Rectangle selection
Circle selection
Free selection
Select all
Save
Delete
2. Choose communication
Activate
Are you sure?
Do you want to activate the alert?
Please confirm below
Confirm
Cancel
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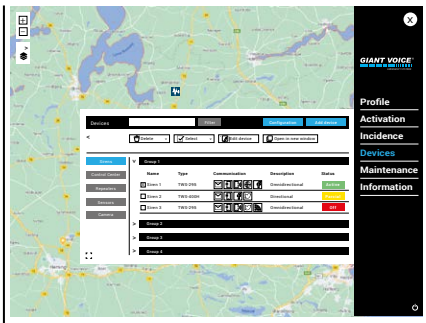
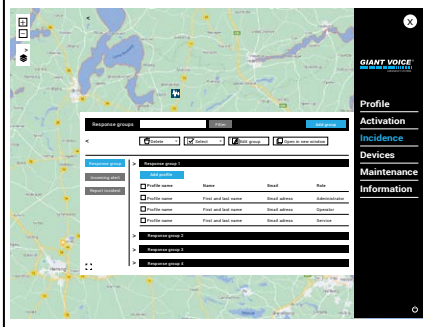
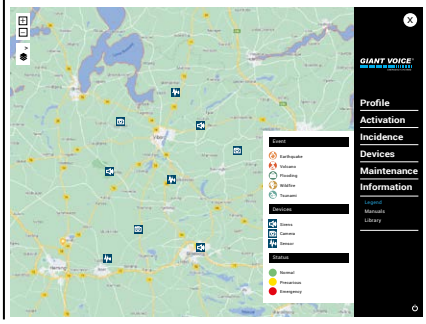
WARNING SYSTEM SOLUTIONS

# WE CUSTOMIZE COMPREHENSIVE AND FLEXIBLE EMERGENCY SYSTEMS




The GV-EMS is a comprehensive and flexible Emergency System providing easy and understandable information that enables the user to make the right decisions and to react within seconds.

The GV-EMS has been developed to meet the customer's need for precise and accurate information at hand, when vital decisions must be made. GV-EMS network structure is designed in a flat hierarchical structure. Working independently or in groups.

The software is delivered preinstalled on the GV-CORE unit that serves as the platform for the Giant Voice® Distributed Communication Network (GV-DCN).

The system is easy to use with its straightforward logic - simply select the system components on the map and then choose your action from one of the on-screen menus.

You can also add predefined sequences to the system by assigning sequences to the programmable activation keys. A sequence is defined by any specific warning priority, such as an alarm (tones) or a public information.

You will not encounter any language barriers and the user interface can be modified with easily recognizable icons and colors.

# GV-EMS. Emergency Management System

**GV-EMS MEETS INTERNATIONAL STANDARDS AND IT IS COMPATIBLE TO ANY COMMON ALERT PROTOCOL**


## INTEGRATION TO ANY DEVICE

- Sensoring systems
- CCTV systems
- Fire detection Systems
- Weather Station and more
- Unlimited amount of devices can be integrated

## MAP FEATURES

- Predefined static map
- Zoom capability
- Rectangle, circle, groups and free selection of devices
- Map formats: JPEG, PNG, SHP, DBF, JSON, GEOjson and SHX format

## ACTIVATION FEATURES

- Activation of selected system components
- Activation status display
- Activation accept allows to preview the command before transmission

## SERVICE FEATURES

- Status data request from selected system components (for example: status, speaker driver or amplifier failure, AC Power, cabinet temperature)
- Real-time status monitoring for any type of RTU device or repeater station

## ANALYSIS FEATURES

- User defined analysis criteria (Period, Selected Sirens, Command Type etc.)
- Data base of status logs with capability of storing information in any format
- Export data function enabling export of selected data to e.g. Microsoft Excel

## FEATURES

- Live voice message through IP-Broadcasting, radio VHF/UHF, etc.
- Unlimited number of programmable predefined sequences
- Predesigned menus for touch screen operation
- Interactive icons and symbols
- Configuration, monitoring and control capability of all system components in real-time
- Integration platform for a variety of components such as public address, general alarm sirens, PABX, sensors, strobe lights, text displays, SMS text message and more
- Individual Log-In ID supporting differentiation between operators, service personnel and administrators in order to secure the system
- Supports GV-DCN network structure
- GV-EMS can manage and monitor devices by any type of communication such as (VHF/UHF) Radio, IP Ethernet, BGAN/Vsat Satellite, GPRS 3G/4G mobile network, EWBS, Digital terrestrial television
- Predefined communication channel management

## OPTIONS

- PABX Integration Additional screens
- 10 digit DTMF protocol
- Mobile App
- Repeater station management
- Rack cabinet enclosure as pr. customer requirements
- Mass notification through SMS, Email and IOS / Android compatible mobile App

Step by step.

# THIS
## IS HOW WE MAKE IT WORK!


HSS
ENGINEERING®
WARNING SYSTEM SOLUTIONS

A full range of high-quality products!

# WE SUPPORT
## YOU ALL THE WAY

**A warning system from HSS Engineering® provides a complete alerting and notification system solution that utilizes a variety of technologies, software and hardware that enable municipalities, defense installations and industrial facilities to maintain the safety and security of their personnel and the general public and industrial facilities to maintain the safety and security of their personnel and the general public.**

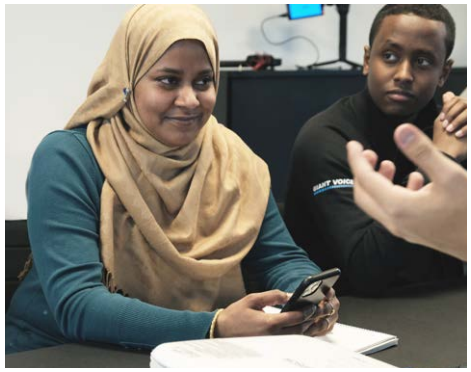
### MANUFACTURER OF CUSTOMIZED WARNING SYSTEM SOLUTIONS

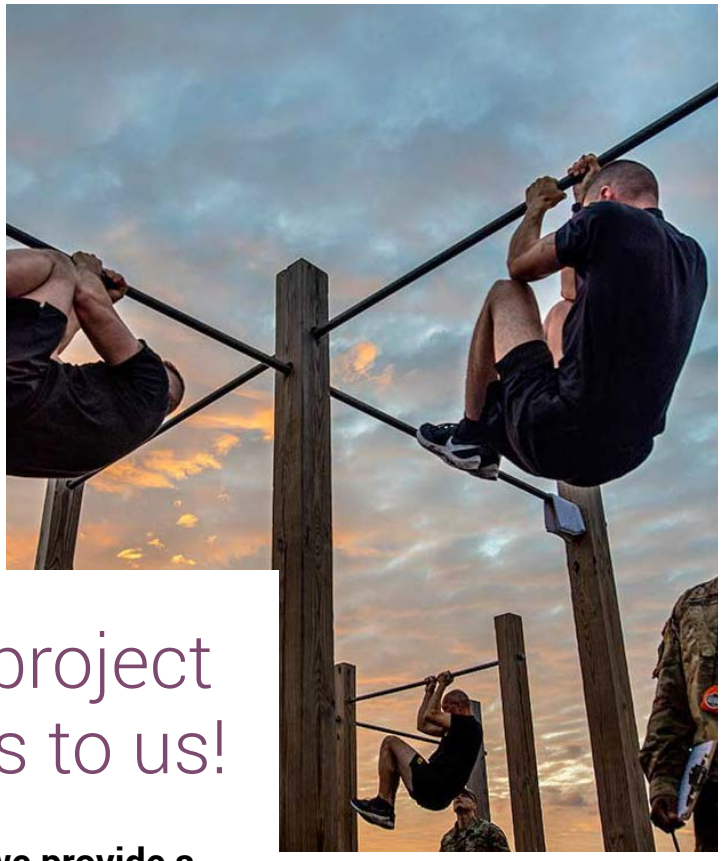
At HSS Engineering® we develop, manufacture, deliver, maintain, customize and assemble Giant Voice® and TWS warning system solutions for tailored warning solutions. Our extensive product range and consultancy services ensure that the customer receives a warning solution that addresses their specific safety requirements in a costeffective and timely manner.

We have challenged our engineers to develop the best technical solutions for a variety of systems. This is why HSS Engineering® currently has an unmatched reputation of providing the best warning system solutions to customers in a global context and with a local perspective.

We have worked successfully with a wide range of customers across North America, Central America, South America, the Middle East, Asia, Europe, and Oceania to provide cost effective, innovative and customized warning solutions. Throughout our 40 years in business, HSS Engineering® has successfully delivered a variety of projects featuring diverse process technologies to clients around the world.


We are specialists with an exclusive dedication in developing, customizing, manufacturing, delivering and maintaining Public Warning Systems (PWS), Emergency Management Systems (EMS), Public Address & General Alarm systems (PA/GA), defense warning systems as well as turnkey systems.

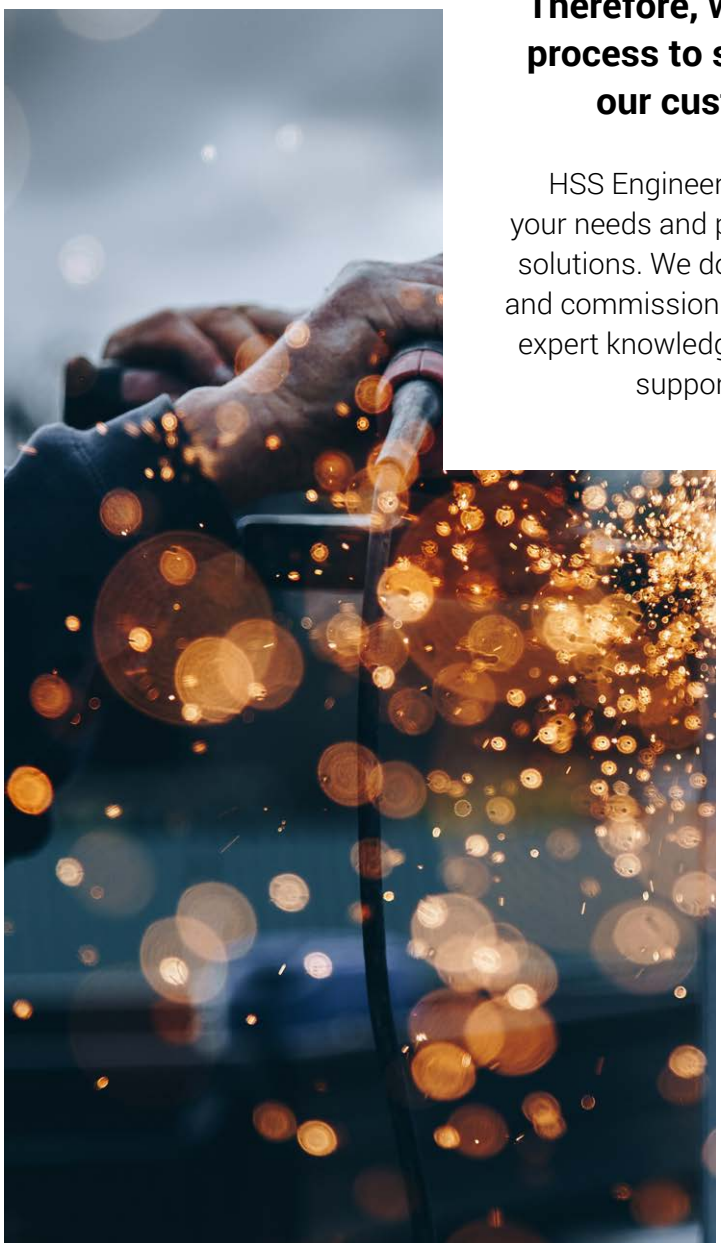


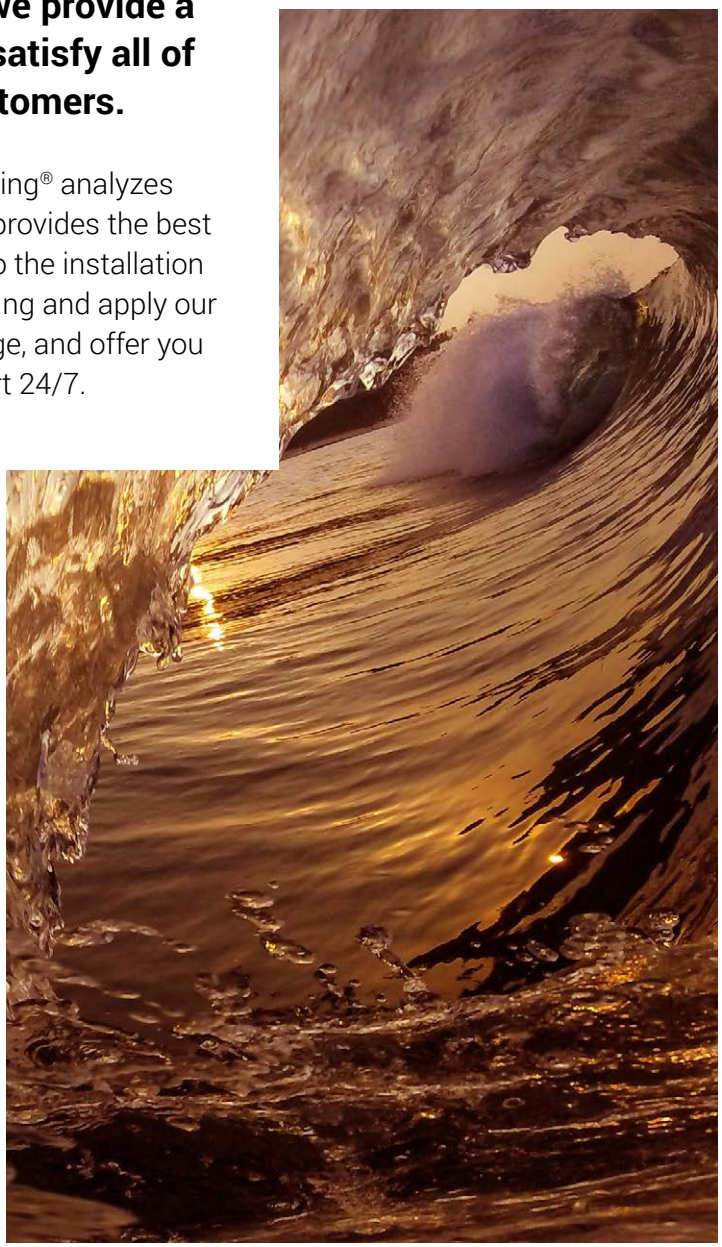


# Every project matters to us!

**Therefore, we provide a process to satisfy all of our customers.**

HSS Engineering® analyzes your needs and provides the best solutions. We do the installation and commissioning and apply our expert knowledge, and offer you support 24/7.





Alerting and notification solutions step by step.

# WE ANALYSE
## YOUR NEEDS

**A warning system from HSS Engineering® provides a complete alerting and notification system solution that utilizes a variety of technologies, software and hardware that enable municipalities, defense installations and industrial facilities to maintain the safety and security of their personnel and the general public and industrial facilities to maintain the safety and security of their personnel and the general public.**

During the consultancy and system design service our engineers help the customer to design or improve the system performance and give advice on individually tailored configurations. We further help our customers to identify system bottlenecks and weaknesses, and suggest courses of action to improve the system's overall responsiveness.

Finally, we are focused on system reliability allowing our customers to take proactive measures to avoid problems, now and into the future.

As part of our comprehensive service, our engineers can be a collaborator in any, or all, of the steps that lead to the design of a new customized warning solution.

### SITE SURVEY

Our system concept design often starts with a detailed site survey during which we assess the customer's requirements for the warning system solution such as

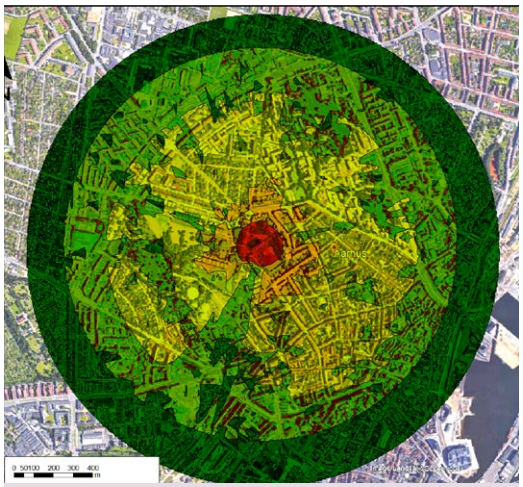
- Integration to other systems such as fire and gas, public address, PABX, etc
- Types of warning required
- Desired system functionality
- Inspection of site conditions such as hazardous areas, type of dangers, etc
- Background noise level, noise mapping and acoustic analysis

Based on the results of our site survey, the feedback from our engineers provides a range of options to consider in planning and designing the warning system solution. The gathered survey information is collected into a site survey report.

Alerting and notification solutions step by step.

# THE DEVELOPMENT OF A RELIABLE SOLUTION

**Several tools and processes are taken into consideration when the HSS Engineering® team is in the process of advising on and designing a system that can resolve all of our customers' warning needs.**



## INPUT

Topography, background noise level, information on buildings and structures, siren type, siren output, siren location and siren cluster elevation

## SOUNDPLAN

Analysis and calculation

## OUTPUT

Graphical presentation, showing siren sound propagation

### Action Matrix

The action matrix is a tool that helps identify the types of warning required, their initiation procedure and the area that should be covered by the system. The action matrix procedure requires careful planning and is developed in close corporation with the customers.

### Acoustics Simulations and Measurements

To ensure that the warning sound propagation will actually cover the relevant areas, HSS Engineering® offers the services of performing field test measurements. The noise measurements serve as the basis for a noise mapping and acoustical analysis. Creating a noise map gives a comprehensive overview, that in a graphical manner, helps identify weak spots in the sound coverage provided by the warning system.

The sound propagation coverage is compared to the sound levels and coverage areas to ensure that these requirements correspond to the International and local standards and regulations given for the area.The HSS Engineering® team can carry out acoustics simulations and measurements for indoor and outdoor environments.

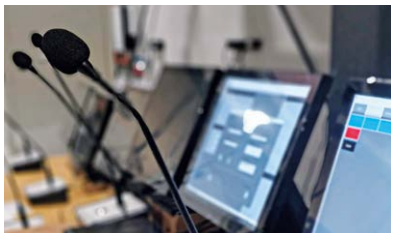
### System Concept Design

Acoustics simulations and measurements can along with the action matrix and other inputs gathered during the site survey be used to make decisions on where and how to install the system. Further more they help designing the interfaces to other external systems.

The system concept design is often kept at a modular level to ensure that the comprehensive overview of the suggested design concept is clear prior to manufacturing and further documentation.

### Technical Solution

At HSS Engineering® we go through a thorough process to ensure that we create, the most optimized solutions that are required to meet our customers' needs. We provide a detailed technical and economical explanation of the customers' solutions that can be adjusted according to the customers' feedback.



Alerting and notification solutions step by step.

# WE PROVIDE
## THE BEST SOLUTIONS

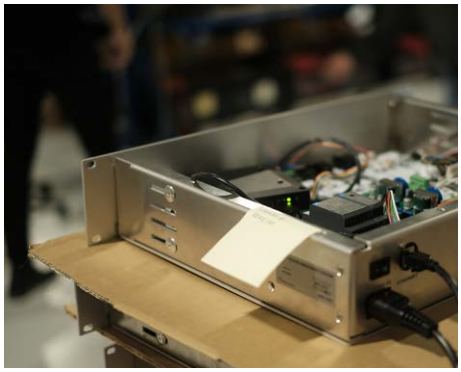
**We develop and provide the most reliable warning solutions.
We are able to customize the solution to meet our customers' requirements.
We handle documentation ranging from simple manufacturing
test sheets to construction drawings and wiring diagrams.**

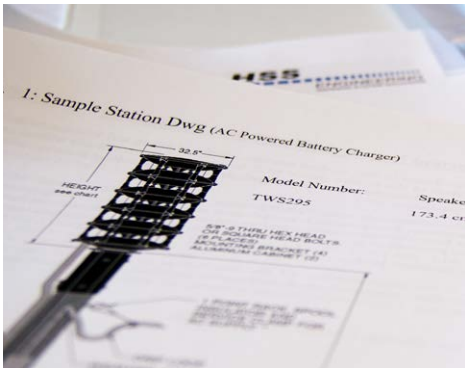
## FACTORY ACCEPTANCE TEST

Factory Acceptance Test (FAT) is conducted to determine and document, that the system hardware and software operate according to the customers' specifications.

At HSS Engineering® we consider the factory acceptance test (FAT) to be a very important milestone to;

- Determine and document that hardware / software work according to specifications
- Compare the configuration of the system according to the drawings and documentation
- Test and review the customers' entire operation so that it meets your requirements
- Changes can be identified and incorporated more easily at this stage
- The customer gets the guarantee that each component has been thoroughly tested and verified





Alerting and notification solutions step by step.

# WE DO
## THE INSTALLATION AND COMMISSIONING

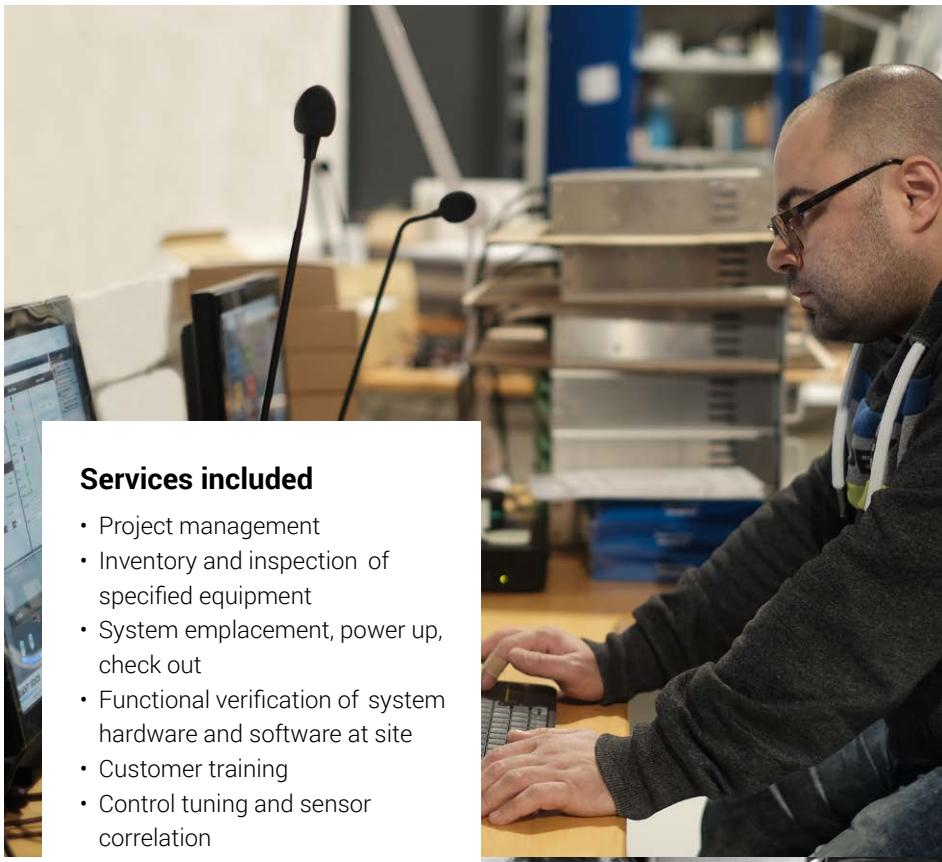
**Our project managers, engineers and technicians are all seasoned professionals familiar with local and international industry standards pertaining to emergency system installations.**

One of the things that sets HSS Engineering® apart from our competitors is that we deploy our own engineers on-site all over the world - including war zones. Our project managers, engineers and technicians are all seasoned professionals familiar with local and International industry standards pertaining to emergency system installation practices for the military, industry and public sectors around the globe. This ensures that we have direct control over the installation process and the ability to fully install, align, test, troubleshoot and commission the system.

Our field engineers receive training in all products each supplementing their specialized competences. This ensures that all field engineers share a common understanding of the system functionality while still maintaining the specialist skills within the deployed crew.

To ensure that all aspects are taken into consideration prior to installation a commissioning plan is laid out between the project manager and the customer to exactly define the system expectations, set a schedule and engage and commit all team members. The effort will be supported by providing the test equipment and knowledge necessary to leave the customer with the assurance that each component has been thoroughly tested and verified.

All of these factors give HSS Engineering® the ability to deliver a full turnkey project in the same high standard every time - anywhere in the world. Nevertheless, we also cooperate with local expert companies to deliver the best solutions.



### Services included

- Project management
- Inventory and inspection of specified equipment
- System emplacement, power up, check out
- Functional verification of system hardware and software at site
- Customer training
- Control tuning and sensor correlation
- Performance verification and documentation

### Benefits

- Streamlined process
- Smoother installations
- Improved quality
- Faster start up at lower cost
- Improved efficiency
- Optimized system performance
- Significantly better end result

Alerting and notification solutions step by step.

# WE TRANSFER
## OUR KNOWLEDGE

**HSS Engineering® offers private courses for customers and business representatives all around the globe, who are looking for a detailed explanation of our delivered system, technological solutions and services.**


We educate our staff thoroughly.

**At HSS Engineering® we are passionate learning facilitators and we target our training courses at the level of the participants.**

**Some of the course topics include:**

- Company overview
- System concept overview
- Communication
- Giant Voice® – Emergency management system training
- Discussing different system scenarios
- SPL standards
- System maintenance
- System troubleshooting

We have custom courses for all customers based on their focus areas. Our training courses are held at our headquarters in Denmark as well as on site, depending of our customers' needs.

Within the HSS Engineering® training, we use exercises and activities in which our participants can get practically involved. As a result, the participants gain knowledge of how the system operates.

# We have divided our training classes into 4 levels

- Operators training
- Basic service and maintenance
- Advanced service and maintenance
- System administrator/ administration

All classes are complemented with an official HSS Engineering® training class certificate stating the level and time of training.

Alerting and notification solutions step by step.

# WE OFFER
## SUPPORT 24-7

**Our support and maintenance program can provide both reactive (emergency support) services and proactive (preventative maintenance) services. We currently run service programs ranging from on-call service for hardware repair to full-time deployed engineers in war zones.**

Warning systems supplied by HSS Engineering® have a two-year warranty period and require very low maintenance. However, even after the warranty period has expired, ongoing support and technical assistance is available. HSS Engineering®'s support and maintenance program can provide both reactive (emergency support) services and proactive (planned preventative maintenance) services.


With an on-site support and maintenance program you get the combination of experience, technical knowledge and on-site support that ensures that your system can perform at any time. This program features a single point of contact for quick and reliable assistance, and HSS Engineering®'s dedicated personnel offers a professional service to its valued customers all over the world. All terms for our support and maintenance program can be set according to the specific customer needs. As such we currently run service programs ranging from on-call service over hardware repair to full-time deployed engineers in war zone.

Alerting and notification solutions step by step.

# KEEP YOUR
## SYSTEM RUNNING

### Planned preventative maintenance

A preventative maintenance contract with HSS Engineering® provides periodic checks and alignment to keep the system operating at published specification levels and helps prevent failures.

During our preventative maintenance, in addition to the standard maintenance, we also examine all con-sumable and possible failure parts of the system and report on their condition. Rectification can then be made avoiding a potentially costly and disruptive system failure.

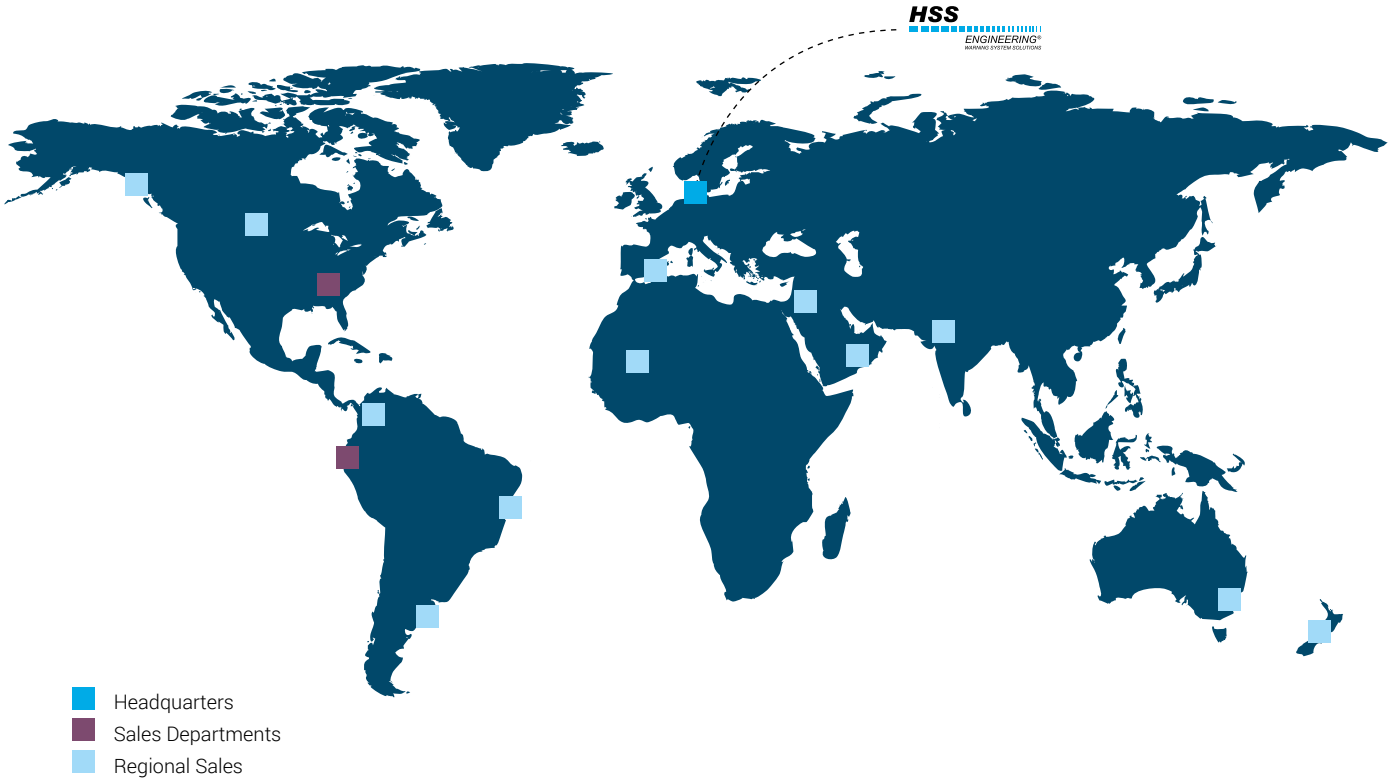

### Reactive service

With a reactive service contract with HSS Engineering®, we take responsibility for the full repair by authorized HSS Engineering® personnel if a piece of equipment should fail.
In a standard reactive service contract, you send the failed equipment to us for repair or replacement and we will return it to you within the agreed maximum time scale. The reactive service contract can also contain a 24-hour-hotline e-mail and telephone service for quick and reliable assistance.

### On-site service and maintenance

When the preventative and reactive maintenance services are not sufficient for your warning system solution, we also provide an on-site support and maintenance contract.

The on-site service and maintenance contract is tailored specifically to your needs and requirements. We offer every level of service from an on-call service to a full time deployed engineer 24 hours a day, 7 days a week and 365 days a year.

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ISO 9001:2015 certified company

REV. C

ORBCOMM®

CONNECTING THE WORLD'S ASSETS

# ST 9100
# Hardware Guide

T413, Version 03
Apr 2021

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# CONTACT AND LEGAL INFORMATION

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# PREFACE

## Purpose

This document is as an overview of the hardware characteristics and specifications for the ST 9100.

## Notation

A terminal consists of a transceiver unit plus antennas.

Hardware components and hardware labels in this document might not be exactly as shown and are subject to change without notice.

CAUTION: This safety symbol warns of possible hazards to personnel, equipment, or both. It includes hazards that will or can cause personal injury, property damage, or death if the hazard is not avoided.

Note: A note indicates information with no potential hazard. A note indicates points of interest or provides supplementary information about a feature or task.

Numbered lists indicate a series of steps required to complete a task or function.

Bulleted lists highlight information where order or sequence is not crucial.

## Reference

The content of the following documents might be useful in conjunction with this guide. These documents are available from the downloads section of the partner support website or from the ORBCOMM Developer Toolkit (ODT), which is also available from the website.

Document names and numbers are subject to change, or be discontinued, without notice. Always check the partner support website for the most current version of these documents.

| | |
|---|---|
| [N210] | IsatData Pro Gateway Web Service 2 User Guide |
| [N206] | MTWS Cellular Protocol |
| [T404] | LSF Developer Guide (FW v4.x) |
| [T405] | IsatData Pro Service API Ref (FW v4.x) |
| [T414] | ST 9100 Installation Guide |

## Battery Safety Warnings

CAUTION: Do not short circuit or expose the battery to temperatures above the maximum rated temperature.

CAUTION: Always follow local disposal guidelines to properly dispose of the Lithium-ion battery and the device.

CAUTION: Store in a cool, well ventilated area. Elevated temperatures will result in shortened battery life.

CAUTION: DO NOT replace the battery. Changing the battery without ORBCOMM's permission could violate regulatory conformity.


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CAUTION: DO NOT throw the internal battery or the device into fire.


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# 1 PRODUCT OVERVIEW

The ST 9100 is a flexible, robust, and programmable dual mode satellite-cellular terminal. It is ideal for remotely monitoring and controlling fixed and portable assets in industries as diverse as transportation, oil and gas, utilities, maritime and more. The versatile, environmentally sealed ST 9100 is ideal for rugged environments in the world's most remote areas.

The ST 9100 (Figure 1) is a satellite-cellular terminal. Features include the following:

- An IsatData Pro satellite-cellular transceiver for communicating with the network
  - Part number ST9100-D01 for use in the Americas
  - Part number ST9100-C01 for use outside of the Americas
- An integral multi-GNSS subsystem
- Four (4) general purpose I/Os
- Two (2) dedicated open drain outputs
- Four (4) inputs (digital or 0-5 V analog of which the first two can be configured as 4-20 mA)
- Two (2) RS-232 ports
- One (1) RS-485 port
- Two (2) CAN Bus ports
- One (1) 1-Wire interface
- 3-Axis 16-bit accelerometer
- Multiple SIM support
- Cellular module
- Bluetooth connectivity
- Internal backup battery
- Satellite antenna (p/n ST901065-APA standard antenna, ST901066-APA low elevation antenna)
- Cellular antenna - LTE/3G/2G fallback (p/n ST101066-001)
- Terminal shroud (optional- p/n ST101014-001)

Figure 1: ST 9100 Satellite-Cellular Transceiver



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The transceiver's built-in programmability allows it to work as a standalone data-messaging transceiver, with built-in I/O data collection and processing capabilities. Feature-rich software tools make programming easy and shorten the design and testing time. The transceiver can also be configured with terminal apps. Terminal apps are configurable device-level applications that include specific feature sets that are implemented by ORBCOMM. Contact Customer Support or your Account Manager for further details.

## 1.1 Overview of the Messaging System

The IsatData Pro satellite messaging system is designed to support the management of mobile or fixed assets located around the world. An asset fitted with one of ORBCOMM's satellite based mobile terminals can have their status and locations monitored and send large messages.

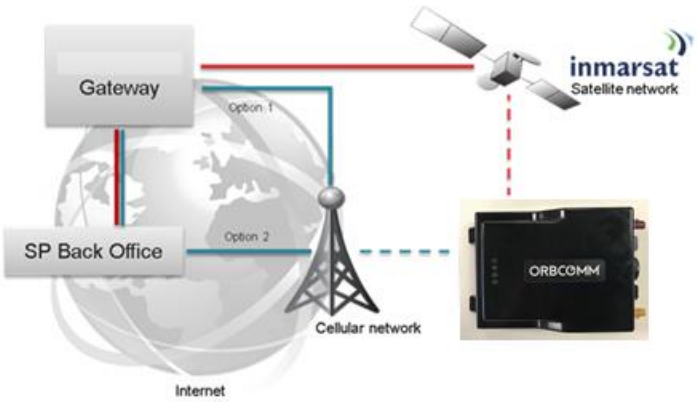
The network provides the following key features and benefits:

- Polling of terminal status and location
- Scheduled reporting of terminal status and location
- Transmission of text messages to and from a serial port on the transceiver
- Two-way communication for messaging to and from the asset for near real-time control
- Up to 6,399 bytes from-mobile messages
- Up to 10,000 bytes to-mobile messages
- Default acknowledged messages
- Global service

Service is provided to end users by Solution Providers (SPs) who use the IsatData Pro network to offer particular applications and/or services to their clients. The SPs link their application services to the satellite terminals by connecting to the IsatData Pro gateway. This acts as the communications hub of the system, routing traffic to and from the terminals and the various service providers.

The terminal can be configured to route cellular messages through the same IsatData Pro Gateway that supplies satellite messages. This is shown as Option 1 in the System Diagram. Option 2 represents a terminal configured to route cellular messages directly to a customer or Solution Provider proprietary cell server. In this case the connection to ORBCOMM's IsatData Pro Gateway supplies satellite messages. Refer to [T404, N206, and N210] for more information about configuring the terminal's cellular messaging transport.

Figure 2: System Architecture





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The satellite-cellular terminal is based on Lua software and is supported by a suite of IsatData Pro tools, enabling SPs a programmable platform they can tailor to their specific applications.

## 1.2 Terminal

Note: Hardware components may not be exactly as shown in this document. A terminal consists of a transceiver unit plus antennas.

Transceivers with a standard antenna operate on the IsatData Pro network at an elevation angle of 20° to 90° and -5° to 90° for transceivers with low elevation antennas. The transceivers are self-contained, compact, and provide low power consumption.

A cellular module is available to operate over the cellular network

The transceiver's built-in programmability allows it to work as a stand-alone with built-in I/O data collection and processing capabilities. Terminals are suitable for the AVL market.

Feature-rich software tools make application design easy and shorten the design and testing time. ORBCOMM also provides consulting services to SPs to help program the transceiver and get customer applications running quickly.

## 1.3 Transceiver Components

CAUTION: Do not rely solely on the terminal for emergency (SOS) calls.

In addition to the features mentioned earlier, the transceiver has the following benefits:

- Designed to be used as a standalone or incorporated into an SP solution
- Built-in dual-GNSS receiver to calculate position, speed, and heading
- Quick and easy installation reduces labor time and costs
- Installed firmware
- Flexible custom application design (Lua Services Framework)
- Wide operational temperature range
- Satellite plus cellular modem integration
- Discrete I/O ports to interface with a wide range of after-market accessories
- Rugged construction

### 1.3.1 Transceiver Unit

Each transceiver is a self-contained unit, including a satellite/cellular modem, a multi-GNSS module, programmable microcontroller, and multiple discrete and analog I/Os (input/output) capable of monitoring and controlling external sensors and devices. Ideal for mobile applications, it is also suitable for fixed installations.

Arranging the transceiver unit's connectors (Figure 3) at one end of the unit simplifies installation. Sturdy flanges on the side make mounting quick and easy.


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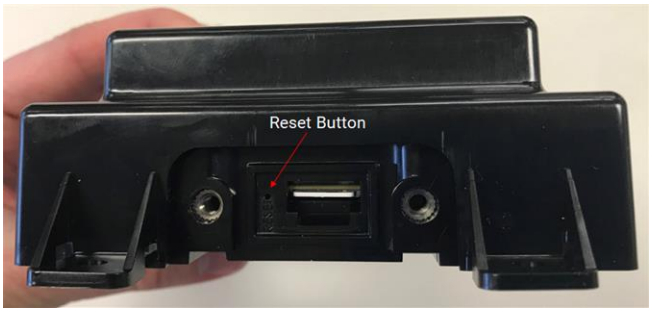
Figure 3: Connector Position


An anti-tamper SIM door on the back side of the transceiver (Figure 4) provides easy access to the SIM card holder and reset button.

Figure 4: SIM Access Door

Figure 5: Reset Button




### 1.3.2 Satellite Antenna

CAUTION: Use only color-matching antennas.

The satellite-cellular transceiver's satellite antenna is waterproof and designed to operate in extreme environments. It has four mounting flanges for installation.

The satellite antenna connects to the transceiver using a 5 m (16 ft.) cable terminated with a curry yellow colored FAKRA RF connector.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The satellite-cellular transceiver is available with either the standard satellite antenna (Figure 6) or the low elevation satellite antenna (Figure 7).

Figure 6: Standard Satellite Antenna

Figure 7: Low Elevation Satellite Antenna

### 1.3.3 Cellular Antenna

CAUTION: Use only color-matching antennas.

The ST 9100 cellular antenna is an LTE antenna with a burgundy colored FAKRA connector.


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Figure 8: Cellular Antenna


### 1.3.4 Terminal Shroud

Use the optional terminal shroud if mounting the transceiver outdoors.

Figure 9: Terminal Shroud


### 1.3.5 ST 9100 Cables and Connectors

The following are available for the ST 9100:

- A 5-meter blunt cut cable (p/n ST101062-002). Refer to [T414] for details.
- An IP67 Field Installable Connector (p/n ST101096). Refer to [T414] for details.
- A development cable (p/n ST101084-001). Refer to APPENDIX A for details.

CAUTION: An external 5 A slow blow fuse must be added in series with the external voltage wire (Table 3).


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# 2 SPECIFICATIONS

## 2.1 Temperature

| Parameter | Value |
|---|---|
| Operating Temperature Range | -20°C to +80°C (-4°F to +176°F) |
| Storage Temperature Range | -20°C to +35°C (-4°F to +95°F) |

### 2.1.1 Internal Backup Battery Temperature

Table 1 defines the internal backup battery's temperature specifications.

Table 1: Transceiver with Internal Backup Battery Temperature Specifications

| Parameter | Value |
|---|---|
| Charge Temperature Range | 0°C to +45°C (32°F to +113°F) |
| Discharge Temperature Range | -20°C to +75°C (-4°F to +167°F) |
| Storage Range | |
| ≤ 1 month | -20°C to +45°C (-4°F to +113°F) |
| ≤ 3 months | -20°C to +35°C (-4°F to +95°F) |
| ≤ 1 year | 0°C to +30°C (32°F to +86°F) |
| Ideal for long-term storage | 10°C to +25°C (60±25% R.H.), (50°F to +77°F) |

## 2.2 Electrical

### 2.2.1 Input Range

CAUTION: An external 5 A slow blow fuse must be added in series with the external voltage wire (Table 3).

| Parameter | Value |
|---|---|
| Power Supply Voltage | 9 to 32 V DC |

### 2.2.2 Power Consumption

Typical values with a transceiver input voltage of 12 VDC.

Table 2: Transceiver Input Currents

| Mode of Operation | Condition | 25°C (77°F) | -40°C (-40°F) | 85°C (185°F) | Unit |
|---|---|---|---|---|---|
| Sleep | Externally powered | 511 | 322 | 750 | µA |
| Charger | ON | 400 | N/A | N/A | mA |
| SatCom Tx | Burst current | 733.87 | 720.77 | 728.13 | mA |


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| Mode of Operation | Condition | 25°C (77°F) | -40°C (-40°F) | 85°C (185°F) | Unit |
|---|---|---|---|---|---|
| SatCom Rx | Burst current for Rx frequency. 1540045000 1000 2 (C/No=42dBHz) | 76.70 | 25.77 | 80.13 | mA |
| GPS | Cold fix current during uBlox on command | 32.60 | 38.37 | 36.59 | mA |
| TOBY Rx (Idle) | measure Rx level in 129 channels for 1000 ms intervals | 91.52 | 101.36 | 102.3 | mA |
| | measure Rx level in LTE FDD5 for 1000 ms | 88.97 | 92.31 | 104 | mA |
| | measure Rx level in LTE FDD 12 for 1000 ms | 89.17 | 91.10 | 156.92 | mA |
| TOBY Tx max | 2G-850 TX in channel=189, PCL=0 (max power), Seq=5, Mod=1(GMSK), Interval=5000 ms | 403.99 | 375.03 | 473.8 | mA |
| | 2G-900 TX in channel=37, PCL=0 (max power), Seq=5, Mod=1(GMSK), Interval=5000 ms | 777.52 | 614.95 | 900 | mA |
| | 2G-1900 TX in channel=698, PCL=0 (max power), Seq=5, Mod=1(GMSK), Interval=5000 ms | 504.42 | 510.73 | 525.17 | mA |
| | 4G FDD band 5, 850MHz, TX in channel=120525, power=24 dBm, Internal=5000 ms | 224.88 | 202.20 | 236.68 | mA |
| | 4G FDD band 2, 1900MHz, TX in channel=118900, power=24 dBm, Internal=5000 ms | 270.94 | 288.16 | 282.63 | mA |

### 2.2.3 Load Dump Protection

Active load dump protection is provided on the power pins. The cut-off is >34 V and automatic reset of the load dump occurs when the input voltage is <34 V.

### 2.2.4 Inrush Currents

Typical inrush currents: 12 volts and 25°C (77°F).

| Quantity | Value |
|---|---|
| Peak in-rush current | 4.12 A |
| In-rush pulse duration | 138 µS |

### 2.2.5 Reverse Voltage Input

| Parameter | Voltage |
|---|---|
| Reverse Polarity Protection | -40 V DC (maximum) |

### 2.2.6 SIM Cards

The transceiver offers two embedded (not field replaceable) and one removable 3FF (micro SIM) SIM card. The specifications for the SIM cards are the same.

| Parameter | Value |
|---|---|
| SIM Voltage | 1.8 V or 3 V standard SIM cards |
| Card Detection | Switch connected to cellular module |


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## 2.3 Connectors

| | |
|---|---|
| **Transceiver 24 position mating connector** | Chogori Technology Company |
| **Satellite Antenna** | IMS Connector Systems<br>3400.SMBA.2K10.089 (RG58/LMR-195 sized cable)<br>FAKRA - K-curry yellow |
| **Cellular Antenna** | IMS Connector Systems<br>3400.SMBA.2D10.029 9RG174 sized cable)<br>FAKRA - D-bordeaux |

### 2.3.1 Connector Pin Assignment

Table 3 maps to the layout shown in Figure 10.

Figure 10: Transceiver View of Connector

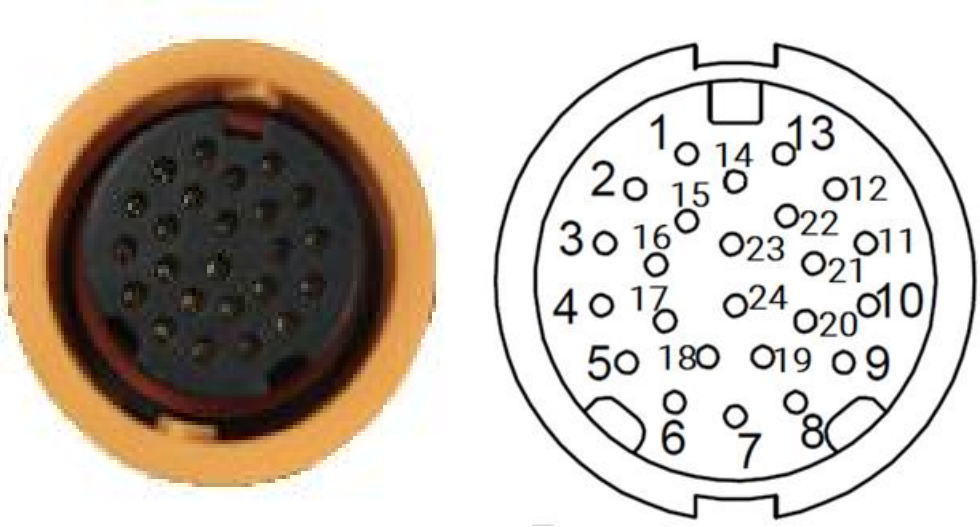


Table 3: Electrical Pin Assignment

| PIN | Function | Type | Description |
|---|---|---|---|
| 1 | RS485_A | I/O | Half duplex RS485 driver output or receiver input (complementary to RS485_B) |
| 2 | Digital_IN4 / 0-5 V_IN4 | I | Digital input or 0-5 V analog input |
| 3 | Digital_IN3 / 0-5 V_IN3 | I | Digital input or 0-5 V analog input |
| 4 | I/O_4 | I/O | Multifunction GPIO, push-pull, analog input, current limited current sink or ignition load |
| 5 | I/O_2 | I/O | Multifunction GPIO, push-pull, analog input or current sink |
| 6 | Ground | PWR | External supply ground return |
| 7 | External Voltage | PWR | External 9-32 VDC supply |
| 8 | Output_6 | O | Open drain output |


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| Parameter | Min. | Max. | Units |
|---|---|---|---|
| **Current Loop** | | | |
| Operating current range | 4 | 20 | mA |
| Load voltage at 4 mA | 0.396 | 0.404 | V |
| Load voltage at 20 mA | 1.98 | 2.02 | V |
| Load resistance | 99 | 101 | Ω |
| Loop voltage (supplied by users externally) | 10 | 32 | V |
| Maximum input high voltage | - | 32 | - |
| **ESD** | | | |
| TVS breakdown voltage | 40 | 44.2 | V |
| TVS clamp voltage | - | 58.1 | V |

## 2.5 Serial Interfaces

Transceivers have the following interfaces:

- 2 x CAN Bus
- 1 x RS-485/J1708
- 2 x RS-232
- 1 x 1-Wire

### 2.5.1 CAN Bus

The transceiver provides two CAN Bus interfaces for sending and receiving frames.

The transceiver incorporates a controller area network interface with signaling rates up to 1 Mbps.

Note: You must provide a termination resistor externally to the transceiver.

| Parameter | Min. | Typical | Max. | Units |
|---|---|---|---|---|
| Input Common Mode Voltage | -7 | - | 12 | V |
| Differential Input Threshold | -6 | - | 6 | V |
| Peak to Peak Output Common Mode Voltage | - | 1 | - | V |
| Differential Output Voltage (dominant) | 1.2 | - | 3 | V |
| Differential Output Voltage (recessive) No Load | -0.5 | - | 0.05 | V |
| CANH or CANL | -36 | - | 36 | V |
| **ESD Protection** | | | | |
| Human Body Model[1] | - | ±16 | - | kV |
| Contact Discharge Model | - | ±30 | - | kV |

[1]All electrical interfaces operate normally after being subjected to 8 kV ESD contact discharge per IEC 60945 and IEC 61000-4-2 human body model, level 3.


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| PIN | Function | Type | Description |
|---|---|---|---|
| 9 | 1Wire Com | PWR | 1-WIRE return path |
| 10 | Console_RS232_TX | O | ±15 kV ESD protected, RS-232 level (nominally ±5.5 V) transmitter outputs |
| 11 | AUX_RS232_RX | I | TTL/CMOS level receiver outputs |
| 12 | CAN1_H | I/O | High level CAN BUS line |
| 13 | CAN1_L | I/O | Low level CAN BUS line |
| 14 | CAN0_L | I/O | Low level CAN BUS line |
| 15 | RS485_B | I/O | Half duplex RS485 driver output or receiver input (complementary to RS485_A) |
| 16 | Digital/Analog_IN1 /<br>0-5 V_IN1 /<br>P1_4-20 mA+ | I | Digital input or 0-5 V analog input or 4-20 mA input |
| 17 | I/O_3 | I/O | Multifunction GPIO, push-pull, analog input or current sink |
| 18 | I/O_1 | I/O | Multifunction GPIO, push-pull, analog input or current sink |
| 19 | Output_5 | O | Open drain output |
| 20 | 1Wire_DATA | I/O | Input/output driver for 1-Wire Line |
| 21 | Console_RS232_RX | I | TTL/CMOS level receiver outputs |
| 22 | AUX_RS232_TX | O | ±15 kV ESD protected, RS-232 level (nominally ±5.5 V) transmitter outputs |
| 23 | CAN0_H | I/O | High level CAN BUS line |
| 24 | Digital_IN2 /<br>0-5 V_IN2 /<br>P2_4-20 mA+ | I | Digital input or 0-5 V analog input or 4-20 mA input |

## 2.4 I/O Interface

### 2.4.1 Standard General Purpose I/Os

The transceiver supports four (4) configurable general purpose I/Os (GPIO I/O_1 to I/O_4):

- Digital input with weak (1 MΩ) pull-down
- Digital input with 20-50 K pull-down
- Digital input with 20-50 K pull-up
- Analog input
- Digital output – push-pull
- Digital output – open drain
- Disabled

On certain vehicles, I/O_1 can be used to monitor ignition. The voltage on the I/O pin may not drop low enough to present a logic zero to the host processor when the ignition is turned off. In such a case I/O_1 can be configured to switch in a 4 kOhm load to draw the voltage below the logic zero threshold level of the host processor ensuring a logic zero. The other I/O ports should not be used for ignition monitoring. Refer to section 2.4.1.1

I/O_4 provides dedicated overcurrent/short circuit protection circuitry when operated in the open drain mode. The other I/Os do not have this circuitry therefore I/O_4 is recommended for applications requiring overcurrent/short circuit protection.

Simplified block diagrams of the I/O when configured as digital inputs, digital outputs, and analog inputs are shown in the figures below (Figure 11, Figure 12, and Figure 13).


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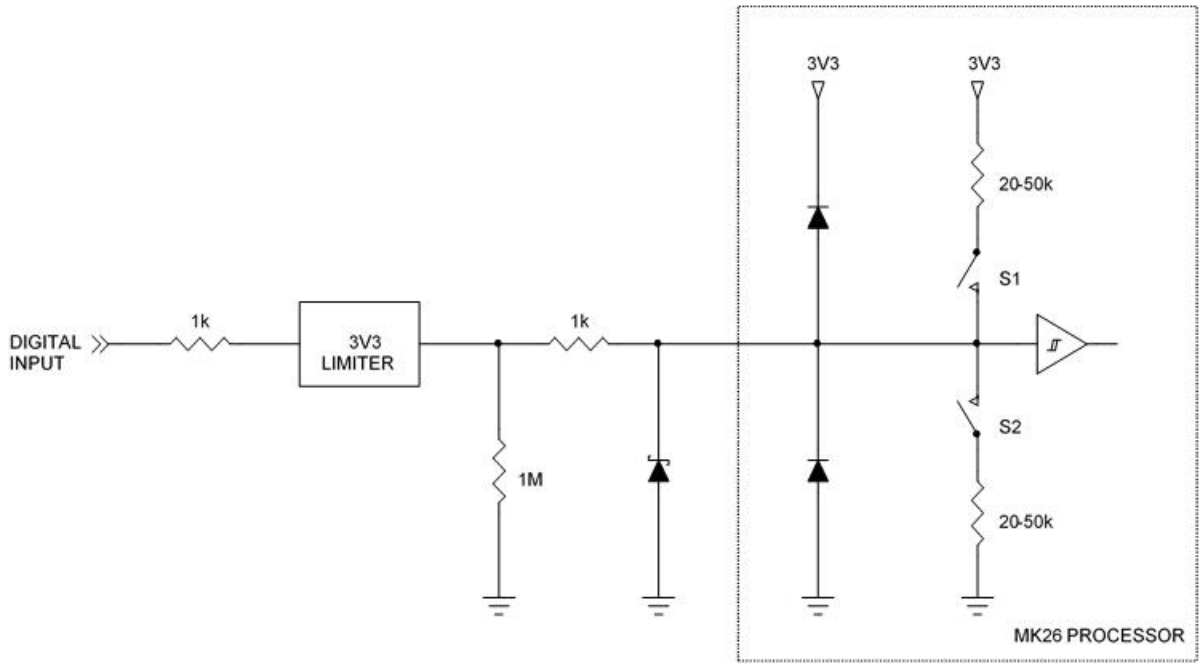
The transceiver also supports two dedicated outputs (Output_5 and Output_6). More information on these outputs can be found in section 2.3.1.

### 2.4.1.1 Digital Input

Figure 11 shows a schematic of the I/O when configured as a digital input.

Figure 11: Digital Input




| Input Type | S1 | S2 |
|---|---|---|
| With weak pull-down | Open | Open |
| With pull-down | Open | Closed |
| With pull-up | Closed | Open |

The input specifications are provided in the table below.

| Parameter | Min. | Typical | Max. | Units |
|---|---|---|---|---|
| Input low range | -10 | - | 1.16 | V |
| Input high range | 2.31 | - | 150 | V |
| Input current with weak pull-down (weak 1 MΩ pull-down still in place); $V_{in}$ = 3.3 V | - | 4.5 | - | µA |
| Input source current with 50 k pull-up ($V_{in}$ = 0.0 V) | - | 75 | - | µA |
| Input sink current with 50 k pull-down ($V_{in}$ = 3.3 to 150 V) | - | 81 | - | µA |
| Input bandwidth | 1 | - | - | kHz |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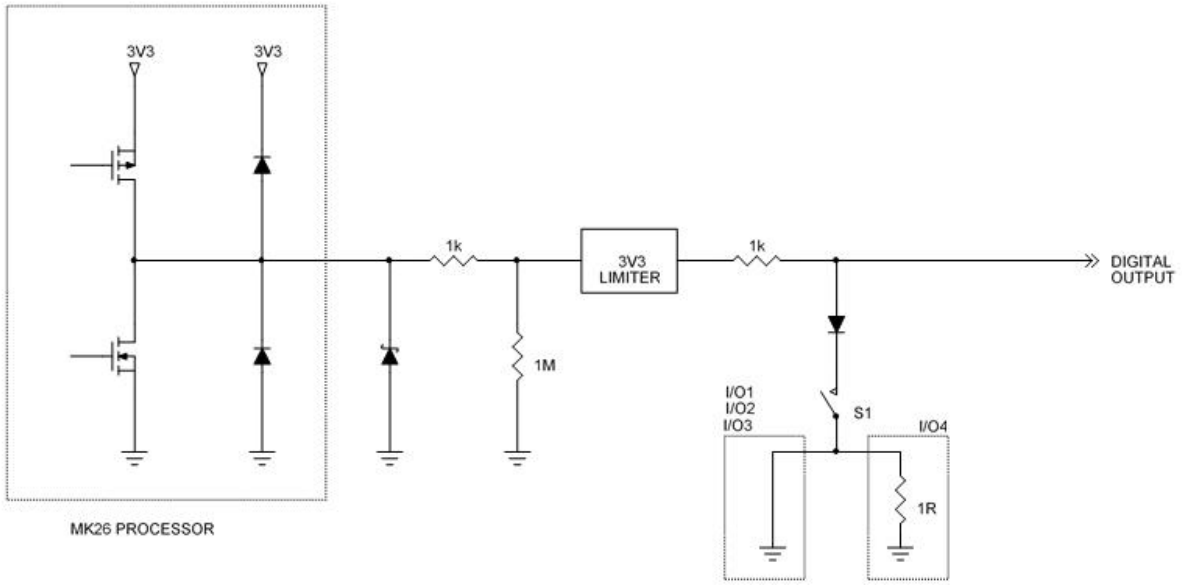
### 2.4.1.2 Digital Output

Figure 12 shows a schematic of the I/O when configured as a digital output.

Figure 12: Digital Output




| | |
|---|---|
| Push-pull | S1 = Open |
| Open drain | S1 = Closed (Low Impedance)<br>S1 = Open (High Impedance) |

#### 2.4.1.2.1 Push-pull

In the push-pull configuration the output is driven directly from the microprocessor.

| Parameter | Min. | Typical | Max. | Units |
|---|---|---|---|---|
| Output high voltage - open circuit | 3.23 | 3.3 | 3.37 | V |
| Output high voltage (sourcing 10 mA) | 2.8 | - | - | V |
| Output low voltage (sinking 10 mA) | - | - | 0.5 | V |
| Output bandwidth | 100 | - | - | Hz |

#### 2.4.1.2.2 Open Drain

| Parameter | Min. | Typical | Max. | Units |
|---|---|---|---|---|
| Sink current (do not exceed) | - | - | 250 | mA |
| Output voltage (sinking 250 mA)<br>I/O_1 to I/O_3<br>I/O_4 | <br>-<br>- | <br>1.15<br>1.40 | <br>1.35<br>1.60 | <br>V<br>V |
| Absolute limits (high impedance) | -10 | - | 150 | V |
| Output bandwidth | 100 | - | - | Hz |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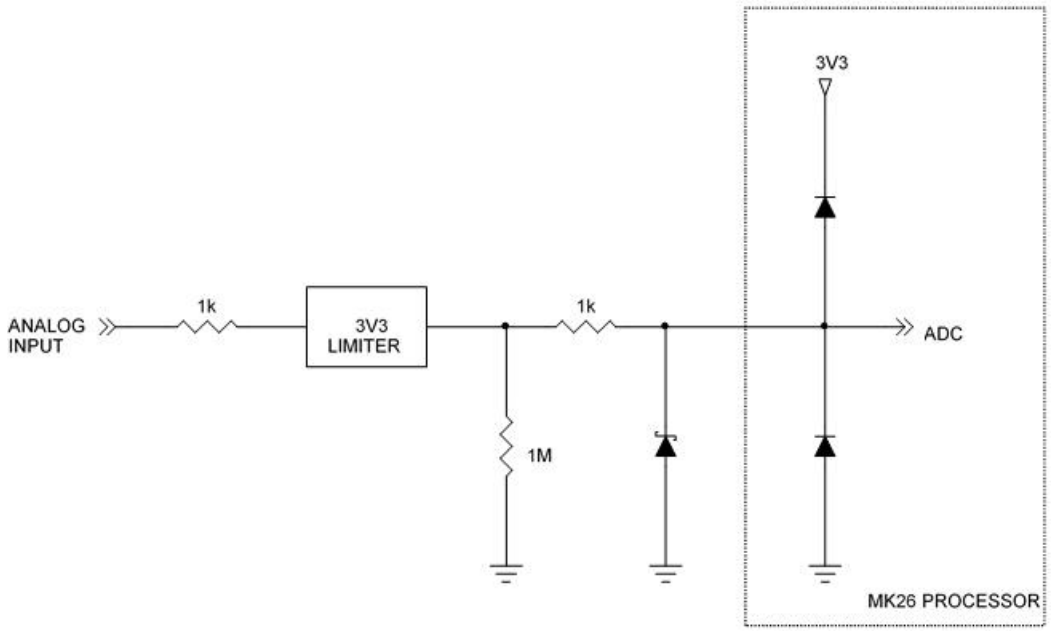
### 2.4.1.3 Analog Input

Figure 13 shows a schematic of the I/O when configured as an analog input.

Figure 13: Analog Input




| Parameter | Min. | Typical | Max. | Units |
|---|---|---|---|---|
| Input impedance | - | 1 | - | MΩ |
| Normal input measurement range | 0 | - | 3.3 | V |
| Resolution (12 bits) | - | 0.8 | - | mV |
| Proportional measurement error | - | - | 3 | % |
| INL error | - | - | 2 | LSB |
| Absolute limits | -10 | - | 150 | V |

## 2.4.2 Dedicated Outputs

The transceiver provides two open drain outputs (output_5 and output_6) that can be used to turn on various devices such as relays, lights or audible alarms. These outputs are capable of sinking current only. Both outputs are controlled from the host processor. The outputs are not protected against over current conditions and you must ensure that the maximum current capability of the internal switch is not exceeded. Both outputs include ESD protection. You must also ensure that the voltage applied to the output pin does not exceed the maximum value as shown in the table below.


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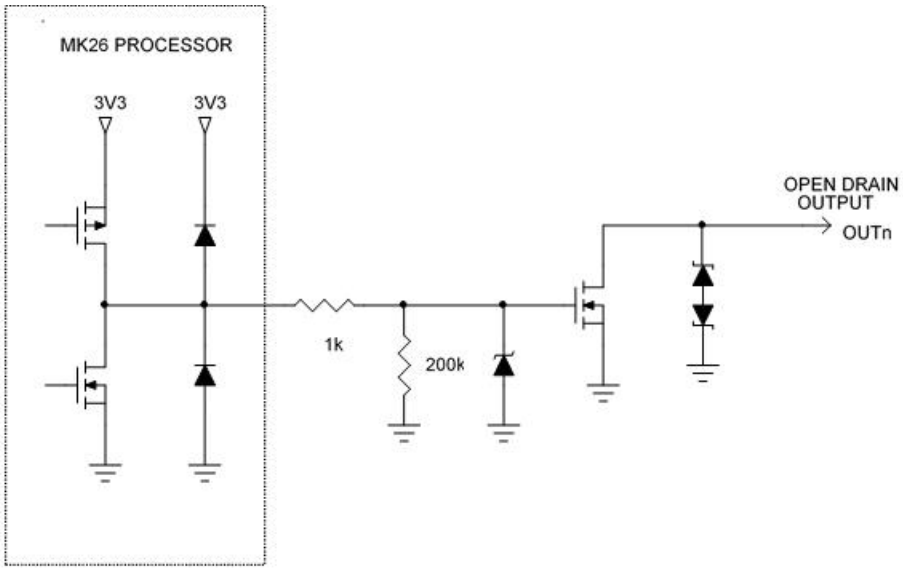
Figure 14: Open Drain Outputs




| Parameter | Max. | Units |
|---|---|---|
| Sink Current | 250 | mA |
| Applied Voltage | 40 | V |
| Internal switch power dissipation | 691 | mW |
| Voltage output (sink current = 250 mA) | 2.76<br>(minimum 48 mV) | V |

### 2.4.3 Multi-purpose Ports

In addition to the standard I/Os, the transceiver provides the following multi-function ports.

- Four (4) digital input only ports.
- Four (4) 0-5 V analog input only ports.
- Two (2) 4-20 mA inputs.

Four pins on the interface connector are independently configured to provide the following combinations:

- Four (4) digital inputs or,
- Four (4) 0-5 V analog inputs or,
- Two (2) 4-20 mA inputs or,
- Two (2) digital inputs and two 0-5 V analog inputs or,
- Two (2) digital inputs and one 4-20 mA input or,
- Two (2) 0-5 V analog inputs and one 4-20mA input.

#### 2.4.3.1 Input Only Ports

Four ports (PINs 2, 3, 16, and 24) can be configured as dedicated inputs. Each input is ESD protected by a 36 V transient voltage suppressor that clamps the input transient at 58 V. A 15 V Zener ensures the FET maximum gate voltage of 20 V is not exceeded.


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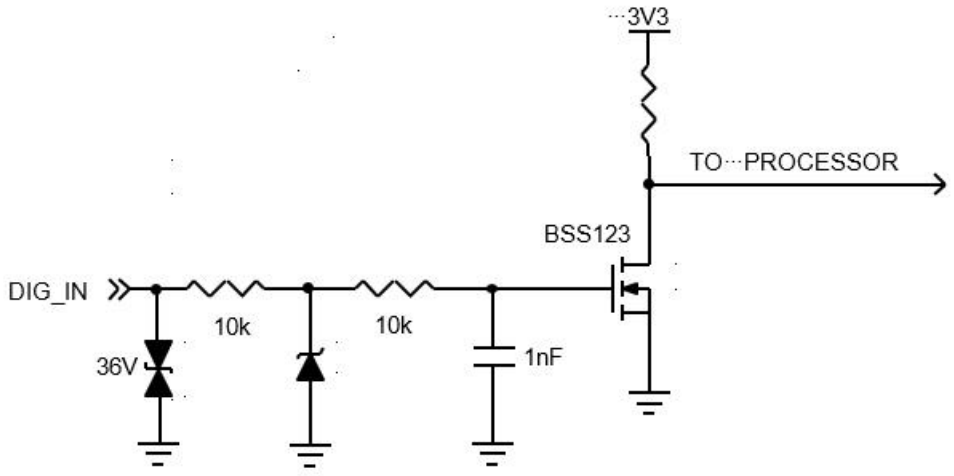
Figure 15: Dedicated Inputs




| Parameter | Min. | Max. | Processor | Units |
|---|---|---|---|---|
| **Digital Input** | | | | |
| Typical Input high voltage (Zener starts conducting at ±14.49 V) | 1.6 | 14 | 0 | V |
| Maximum input high voltage | - | 32 | 0 | V |
| Input low voltage | 0 | 1.4 | 3.3 | V |
| Input frequency | 1 | 10 | - | Hz |
| **ESD** | | | | |
| TVS breakdown voltage | 40 | 44.2 | - | V |
| TVS clamp voltage | - | 58.1 | - | V |

### 2.4.3.2 Analog Inputs (0-5 V)

Four ports (PINs 2, 3, 16, and 24) can be configured as dedicated 0-5 V analog inputs. 0-5 V applied to the ports is converted to 0-3.3 V to be compatible with the ADC voltage range of the host processor.

| Parameter | Min. | Max. | Units |
|---|---|---|---|
| **Analog Input** | | | |
| Input voltage range | 0 | 5 | V |
| Maximum input high voltage | - | 32 | V |
| **ESD** | | | |
| TVS breakdown voltage | 40 | 44.2 | V |
| TVS clamp voltage | - | 58.1 | V |

### 2.4.3.3 Inputs 4-20 mA

The ST9100 can monitor two 4-20 mA sensors. Two ports (PINs 16 and 24) can be configured as two dedicated 4-20 mA receivers.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### 2.5.2 RS-485/J1708

The transceiver provides a half-duplex RS-485 or J1708 interface as an accessory bus and for SCADA interfacing with signaling rates up to 250 kbps.

Note: You must provide a termination resistor externally to the transceiver when required.

The electrical characteristics of the interface are:

| Parameter | Min. | Typical | Max. | Units |
|---|---|---|---|---|
| Input Common Mode Voltage | -8 | - | 12.5 | V |
| Differential Input Threshold | -200 | - | 200 | mV |
| Output Common Mode Voltage | - | 1.8 | 3 | V |
| Differential Drive Output, 54 Ω load | 1.5 | 2.3 | - | V |
| **ESD Protection** | | | | |
| Human Body Model | - | ±16 | - | kV |
| Contact Discharge Model | - | ±30 | - | kV |

### 2.5.3 RS-232 (Console and Auxiliary)

The two RS-232 interfaces default to the following settings: 9600 bit/s, 1 start, 8 data, 1 stop bit, and no parity. The baud rate is configurable up to 115,200 bps.

The electrical characteristics of the interface are:

| Parameter | Min. | Typical | Max. | Units |
|---|---|---|---|---|
| Rx Input Low Threshold for DTE Connected | - | - | -2.7 | V |
| Rx Input High Threshold for DTE Connected | 2.7 | - | - | V |
| Rx Threshold for DTE Disconnected | -0.3 | - | 0.3 | V |
| Serial Rx Input Low Threshold | 0.6 | - | - | V |
| Serial Rx Input High Threshold | - | - | 2.4 | V |
| Rx Input Voltage Range | -25 | - | 25 | V |
| Serial Tx Low Output (3 kΩ load) | - | - | -3.7 | V |
| Serial Tx High Output (3 kΩ load) | 3.7 | - | - | V |
| **ESD Protection** | | | | |
| Human Body Model | - | ±15 | - | kV |
| Contact Discharge Model | - | ±8 | - | kV |

### 2.5.4 1-Wire

The 1-Wire interface allows connection to downstream 1-Wire devices connected on a bus, or to a single button reader. Relative to any attached 1-Wire device, the transceiver behaves as the master. The 1-Wire driver supports 3 or 5 V devices on the bus.

At standard speed, the 1-Wire supports up to 39 devices over a 61-meter (200 feet) CAT5 cable. In overdrive, the usable expected distance is reduced to ≤ 15 meters (≤ 50 feet) with a maximum node count of 9.

The electrical characteristics of the interface are:


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| Parameter | Min. | Typical | Max. | Units |
|---|---|---|---|---|
| 1-Wire Input High Voltage | 3 | - | - | V |
| 1-Wire Input Low Voltage | - | - | 1 | V |
| 1-Wire Output Low Voltage (IOL - 8 mA sink current) | - | - | 0.2 | V |
| **1-Wire ESD Protection Diode and Resistors** | | | | |
| Avalanche Voltage | 7.4 | - | 11.05 | V |
| Trigger Voltage | - | 10 | 11 | V |
| Holding Voltage (IOL - 8 mA sink current) | 5.5 | - | - | V |
| Holding Current | 11 | - | - | mA |
| Continuous Diode Current | - | - | 80 | mA |

## 2.6 RF Specifications

### 2.6.1 Satellite (Standard) Antenna

| Parameter | Value |
|---|---|
| Maximum EIRP | 7 dBW |
| Elevation Angle | 20° to 90° degrees |
| Maximum transmit antenna gain | 4.5 dBic |
| Rx Operating Frequency | 1518-1559 MHz |
| Tx Operating Frequency | 1626.5-1660.5 MHz, 1668-1675 MHz |

### 2.6.2 Satellite (Low Elevation) Antenna

| Parameter | Value |
|---|---|
| Maximum EIRP | 5 dBW |
| Elevation Angle | -5° to 90° degrees |
| Maximum transmit antenna gain | 2.5 dBic |
| Rx Operating Frequency | 1518-1559 MHz |
| Tx Operating Frequency | 1626.5-1660.5 MHz, 1668-1675 MHz |

### 2.6.3 Cellular Antenna

| Parameter | Value |
|---|---|
| Network Coverage | Global: Cat 4 LTE (B1, B3, B5, B7, B8, B28), UMTS (850, 900, 1900, 2100), Quad-band GSM<br>Americas: Cat 1 LTE (B2, B4, B5, B12), UMTS (850, 900, 1900, 2100), Quad-band GSM |
| Frequency | 700/824/960/1710/1880/2170/2600/2700 MHz |
| Impedance | 50 Ω |
| VSWR | 2.0:1 |
| Gain | 2.5 dB |
| Maximum EIRP | 700-2700 MHz |


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### 2.6.3.1 Cellular Antenna Electrical

| Frequency (MHz) | Return Loss (dB) | VSWR | Efficiency (%) | GAIN (dB) |
|---|---|---|---|---|
| 700 | -10.62 | 1.85 | 46.03 | 1.45 |
| 824 | -22.27 | 1.16 | 36.48 | 0.6 |
| 960 | -14.25 | 1.48 | 56.75 | 1.25 |
| 1710 | -19.03 | 1.25 | 44.98 | 2.18 |
| 1880 | -21.14 | 1.21 | 66.68 | 4.74 |
| 2170 | -10.93 | 1.78 | 34.04 | 1.06 |
| 2600 | -22.79 | 1.16 | 49.32 | 3.89 |
| 2700 | -26.19 | 1.10 | 60.12 | 4.45 |

## 2.7 Satellite Transmitting Power

The maximum transmitting power (EIRP) for the IsatData Pro satellite is 7 dBW.

## 2.8 GNSS Module

The transceiver allows concurrent reception of up to three (3) GNSS channels.

The manufacturer's specifications are given in the table below.

Table 4: Multi-GNSS Specifications

| Parameter | GPS | GLONASS | BeiDou | Galileo |
|---|---|---|---|---|
| **Time to First Fix** | | | | |
| Cold Start | 29 s | 30 s | 34 s | 45 s |
| Warn Start | 2s | 2 s | 3 s | 7 s |
| Hot Start | 1 s | 1 s | 1 s | 1 s |
| **Sensitivity** | | | | |
| Tracking | -162 dBm | -166 dBm | -160 dBm | -159 dBm |
| Hot Start | -157 dBm | -156 dBm | -155 dBm | -151 dBm |
| Cold Start | -148 dBm | -145 dBm | -143 dBm | -138 dBm |
| **Accuracy** | | | | |
| Horizontal Position | 2.5 m | 4.0 m | 3.0 m | 4.0 m |
| Velocity | 0.05 m/s | | | |
| Heading | 0.3 degrees | | | |

## 2.9 Internal Backup Battery

The internal backup battery provides autonomous battery charging to the transceiver and operates directly from the external supply over the 9-32 VDC input range. The internal backup battery contains a protection card to ensure that the pack does not get damaged due to a short circuit, over discharge or an over-charge condition.

If the battery voltage is below the minimum set voltage, the charger turns off.


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Table 5: Internal Backup Battery

| Parameter | Value |
|---|---|
| Battery Chemistry | Lithium Ion |
| Back-up Period | 48 hours |
| Rated Capacity | 2000 mAh |
| Charge (capacity) Retention | 90% (after 28 days at 25 ±5°C (77 ±9°F) |
| Battery Cut-off | 7 V |
| Nominal Pack Voltage | 7.2 V (2 x cells in series) |
| Minimum Discharge Voltage | 5 V |
| Charging Voltage | 8.4 V |
| Peak Output Current | 6 A |

Refer to section 1.0.1 for internal backup battery temperature ranges.

## 2.10 Memory

| Parameter | Value |
|---|---|
| PSRAM | 8 MB |
| Flash | 16 MB |

## 2.11 Environmental

| Parameter | Description |
|---|---|
| Vibration | The terminal meets all its specifications during exposure to random vehicular vibration levels per SAE J1455, section 4.10.4.2 figures 6, 7, and 8, and MIL-STD-810H, section 514.8, figure 514.8C-1. |
| Mechanical Shock | The terminal meets all its specifications after exposure to positive and negative saw tooth shock pulses with peaks of 20 G and durations of 11 ms as specified in MIL-STD-810H, section 516.8, Procedure I, section 2.3.2c. |
| Thermal Shock | The terminal meets all of its specifications after a thermal shock test as detailed in SAE J1455, section 4.1.3.2 |
| Drop Test | The terminal meets all its specifications after a handling drop test as specified in SAE J1455, section 4.11.3.1. |
| ESD (Enclosure) | All electrical interfaces operate normally after being subjected to 6 kV ESD contact discharge per IEC 60945 and IEC 61000-4-2 human body model, level 3. |
| Altitude | The terminal meets all specifications after a nonoperating 12.2 km (7.5 miles) altitude test as detailed in SAE J1455, section 4.9.3, except with an ambient temperature of -40°C (-40°F). |
| Humidity | The terminal meets all its specifications during exposure to 90% relative humidity at +85°C (185°F), per the test methodology of SAE J1455, section 4.2.3 (3 x 8-hour humidity cycle per figure 4a) |
| Ingress Protection | IP67 – The terminal meets all of its specifications after immersion and dust tests as detailed in IEC 60529, sections 13.1, 13.4, 14.1, 14.2.7 and 14.3 (with and without optional terminal shroud) |


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# 2.12 Sensors

## 2.12.1 Temperature Sensor

| Parameter | Value |
|---|---|
| Range | -40 to +85°C (-40 to +185°F) |
| Accuracy (typical) | ±4°C (±7.2°F) |

## 2.12.2 Accelerometer

The transceiver has a 3D 16-bit accelerometer to detect motion in any axis.

In low power applications, frequent GPS fixes can dominate the power budget. To reduce the power budget effects of GPS fixes, the accelerometer can be used to detect if motion has occurred.

The accelerometer thresholds to detect advanced features such as driver behavior monitoring vary depending on the environment. To avoid false detects, extensive testing is required to ensure that adequate acceleration magnitude thresholds and time durations are used.

Refer to T405 for additional details.

| Parameter | Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Resolution | - | - | 16 | - | bit |
| Acceleration Range | software selectable | - | +2 | - | g |
| | | - | +4 | - | g |
| | | - | +8 | - | g |
| | | - | +16 | - | g |
| Output Data Rate (ODR) | selectable via digital interface | 12.5 | - | 1600 [1] | Hz |
| Sensitivity | 2 g | - | 16384 | - | LSB/g |
| | 4 g | - | 8192 | - | LSB/g |
| | 8 g | - | 4096 | - | LSB/g |
| | 16 g | - | 2048 | - | LSB/g |
| Sensitivity Temperature Drift | 3 V supply | - | ±0.02 | - | %/K |
| Zero-g Offset | Ta = 25°C (77°F) | - | ±40 | - | mg |
| Zero-g Offset Temperature Drift | 3 V supply | - | ±1 | - | mg/K |
| Wake up Time | from low power or suspended modes | - | 0.8 | - | ms |
| Start up Time | power on reset | - | 3.2 | 3.8 | ms |

# 2.13 Cellular Module - LTE

## 2.13.1 Transceivers Operating in the Americas

Transceivers (p/n ST9100-D01), operating in North or South America, have the following characteristics.

[1] The software supports a maximum ODR of 400 Hz.


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| | |
|---|---|
| **Type** | u-blox Toby R200 series |
| **LTE Module** | LTE bands: 2, 4, 5, 12<br>UMTS bands: 850, 900, 1900, 2100 MHz<br>GSM 850/900/1800/1900 MHz |
| **Output Power** | LTE power Class 3 (23dBm)<br>UMTS/HSDPA/HSUPA power Class 3 (24dBm)<br>GSM/GPRS Power Class:<br>*Class 4 (33 dBm) for GSM/E-GSM band<br>*Class 1 (30 dBm) for DCSPCS band<br>EDGE(8-PSK) Power Class:<br>*Class E2 (27 dBm) for GSM/E-GSM band<br>*Class E2 (26 dBm) for DCS/PCS band |
| **Input Power** | Peak currents of 1.5 A typical, 1.9 A maximum. Module supply peak current consumption: peak of current consumption through the VCC pins during a GSM 1-slot Tx burst at maximum Tx power, with a matched antenna |
| **Data Transfer** | LTE Category 1: up to 10.3Mb/s DL, 5.2 Mb/s UL<br>HSDPA category 8: up to 7.2 Mb/s DL, HSUPA category 6: up to 5.76 Mb/s UL<br>GPRS multi-slot class 33, CS1-CS4, up to 107 kb/s DL, up to 85.6 kb/s UL<br>EDGE multi-slot class 33, MCS1-MCS9, up to 296 kb/s DL, up to 236.8 kb/s UL |
| **Antenna Detect** | Output DC current pulse: 9 µA typical<br>Output DC current pulse time length: typical 330 µs |

### 2.13.2 Transceivers Operating Outside of the Americas

Transceivers (p/n ST9100-C01), operating outside of North or South America, have the following characteristics.

| | |
|---|---|
| **Type** | u-blox Toby L280 series |
| **LTE Module** | LTE bands: 1, 3, 5, 7, 8, 28<br>UMTS bands: 850, 900, 1900, 2100 MHz<br>GSM 850/900/1800/1900 MHz |
| **Output Power** | LTE power Class 3 (23dBm)<br>UMTS/HSDPA/HSUPA power Class 3 (24dBm)<br>GSM/GPRS Power Class:<br>*Class 4 (33 dBm) for GSM/E-GSM band<br>*Class 1 (30 dBm) for DCSPCS band<br>EDGE(8-PSK) Power Class:<br>*Class E2 (27 dBm) for GSM/E-GSM band<br>*Class E2 (26 dBm) for DCS/PCS band |
| **Input Power** | Peak currents of 1.9 A typical, 2.5 A maximum. Module supply peak current consumption: peak of current consumption through the VCC pins during a GSM 1-slot Tx burst at maximum Tx power, with a matched antenna |
| **Data Transfer** | LTE Category 4: up to 150Mb/s DL, 50 Mb/s UL<br>HSDPA category 24: up to 42 Mb/s DL, HSUPA category 6: up to 5.6 Mb/s UL<br>GPRS multi-slot class 12, CS1-CS4, up to 85.6 kb/s DL/UL<br>EDGE multi-slot class 12, MCS1-MCS9, up to 236.8 kb/s DL/UL |


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| | |
|---|---|
| **Antenna Detect** | Output DC current pulse: 21 µA typical<br>Output DC current pulse time length: typical 3.6 ms |

## 2.14 LED

The transceiver has four visible LEDs (2.14) to indicate status. For more detailed LED information, refer to [T404].

Figure 16: LED Location


Table 6: LED Operation

| Icon | Function | Description | Color | LED ON | LED OFF |
|---|---|---|---|---|---|
| | Sensor | Indicates whether a central device (Bluetooth) is connected to the terminal or if the terminal is in fast advertising mode. | BLUE | Bluetooth Central Connected | Bluetooth Central Disconnected |
| | Cellular | Indicates cellular communications status.<br>Note: This LED only functions if the cellular module is powered on. The operation of this LED is dependent on the type of cellular module being used in the device. | GREEN | Data 2G/3G /Registered LTE | No Service (no network or not registered) |
| | Satellite / Satcom | Indicates satellite communications status. | YELLOW | -Power ON /External Reset | - |
| | Power | Indicates that the transceiver has external power. | RED | External Power Present | External Power Absent |


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## 2.15 Mechanical

### 2.15.1 ST 9100

| Parameter | Value |
|---|---|
| Mass | 465 g (16 oz) |
| Enclosure Material | Lexan plastic |

Figure 17: ST 9100 Top View Dimensions

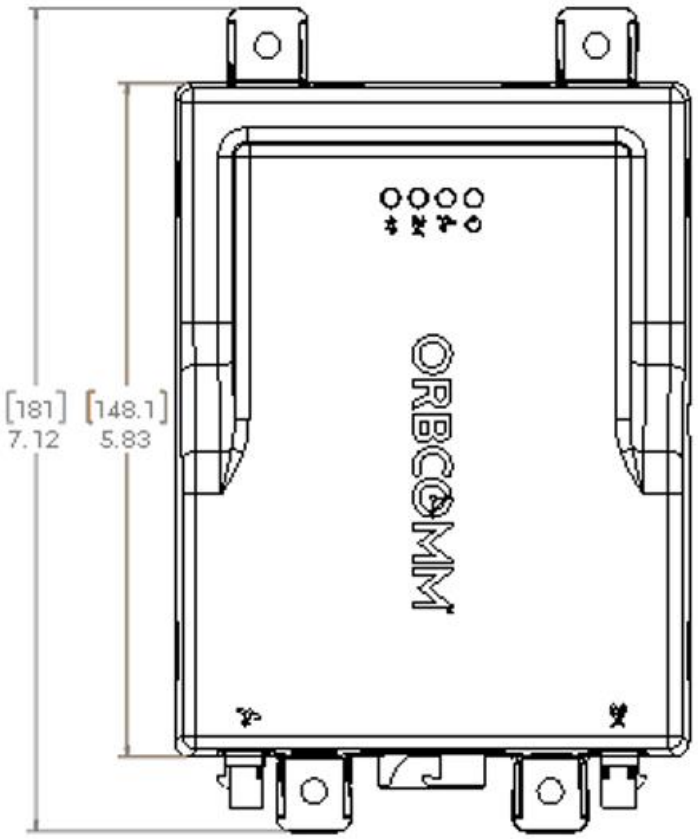



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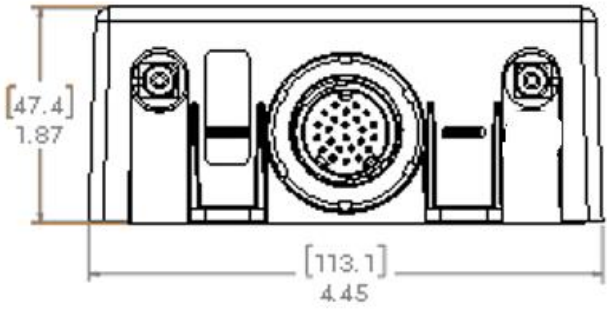
Figure 18: ST 9100 Side Connector View Dimensions




## 2.15.2 Cellular Antenna

| Parameter | Value |
|---|---|
| Mass | 55 g (2 oz.) |
| Dimensions | 129.5 x 22.8 x 7 mm (5 in. x 0.9 x 0.27 in.) |
| Cable length | 3 m (10 ft.) |
| Mounting | FAKRA straight plug connector |
| Operating Temperature | -40°C to 85°C (-40°F to 185°F) |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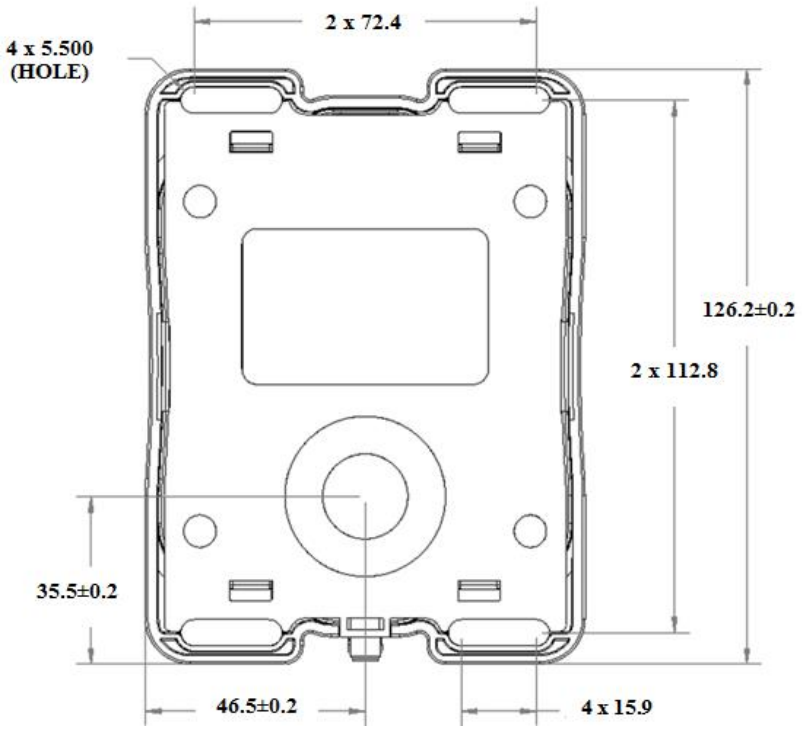
### 2.15.3 Satellite Antenna

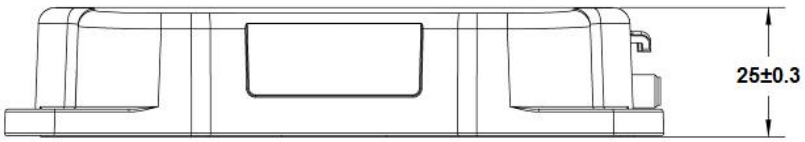
Figure 19: Satellite Antenna (standard and low elevation) - Bottom View (mm)




#### 2.15.3.1 Standard Antenna

| Parameter | Value |
|---|---|
| Mass | Side entry with 5 m (16 ft.) cable: 360 g (13 oz.) |
| Enclosure Material | Lexan EXL |
| Color Code | 8T9D076 (white) |
| Sealing Gasket Material | Santoprene® |

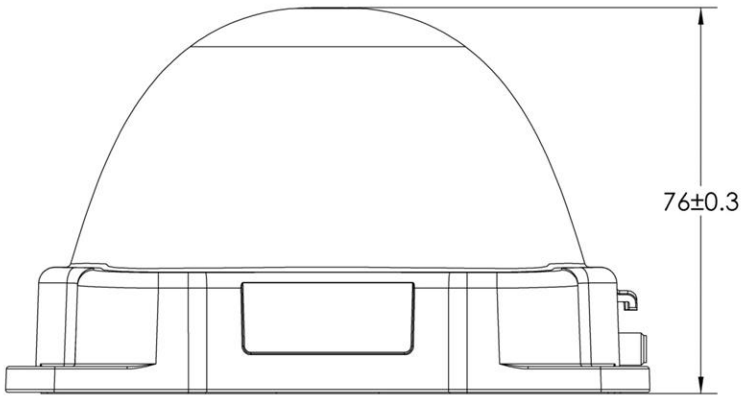
Figure 20: Standard Antenna Height Dimensions (mm)



### 2.15.3.2 Low Elevation Antenna

| Parameter | Value |
|---|---|
| Mass | Side entry with 5 m (16 ft.) cable: 365 g (13 oz.) |
| Enclosure Material | Lexan EXL |
| Color Code | 8T9D076 (white) |
| Sealing Gasket Material | Santoprene® |

Figure 21: Low Elevation Antenna Height Dimensions (mm)




### 2.15.3.3 Terminal Shroud

| Parameter | Value |
|---|---|
| Mass | 150 g (2 oz.) |
| Enclosure Material | Lexan EXL |
| Color Code | 8T9D076 (white) |


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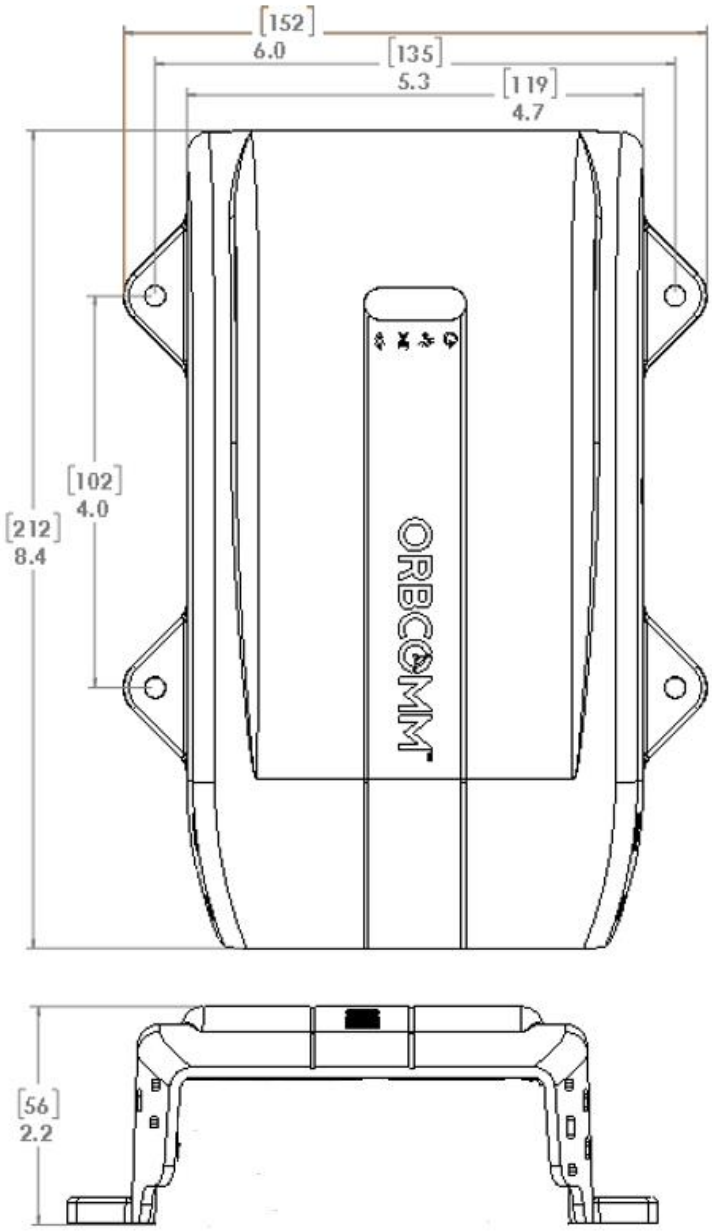
Figure 22: Terminal Shroud Dimensions



# 3 COMPLIANCE

Certifications for the following have been received, unless noted otherwise. Contact your Account Manger for updates.

## Inmarsat Type Approval

## Industry Canada

- IC certification is pending
- ICES-003
- RSS-170, Issue 2, Spectrum Management and Telecommunications Policy, Radio Standard
- RSS-102, radiation safety per Safety Code 6 (compliance shown by computation)
- IC ID: 11881A-ST9100; 11881A-UNNB30; 8595A-TOBYL280 OR 8595A-1EHM44NN

## Anatel Homologation

## FCC

- FCC certification is pending
- CFR 47 Part 25, CFR 47 Part 15
- CONTAINS FCC ID: XGS-ST9100; XGS-UNNB30; XPYTOBYL280 OR XPY1EHM44NN

## CE RED 2014/53/EU

## Ingress Protection

- Cellular antenna: IP65
- Satellite antenna: IP67
- Transceiver unit: IP67

## RoHS

- Restriction of Hazardous Substances (RoHS) [1]

## UN

- UN 38.3 Transportation Compliance

## PTCRB

## AMAC

- Certification is pending

[1]European Union's (EU) Directive 2002/95/EEC "Restriction of Hazardous Substances" (RoHS) in Electronic and Electrical Equipment.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## EU Declaration of Conformity

Hereby, ORBCOMM Inc. declares that the radio equipment types listed in this document comply with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available from http://www2.orbcomm.com/eudoc.

## WARNING:

- The minimum 20 cm (8 in.) separation distance from the device is required for RF exposure safety for all persons.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference.(2) This device must accept any interference, including interference that may cause undesired operation of the device.
    - L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

      1) L'appareil ne doit pas produire de brouillage;

      2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.


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# APPENDIX A DEVELOPMENT CABLE

The development cable is p/n ST101084-001.

Figure 23: Development Cable

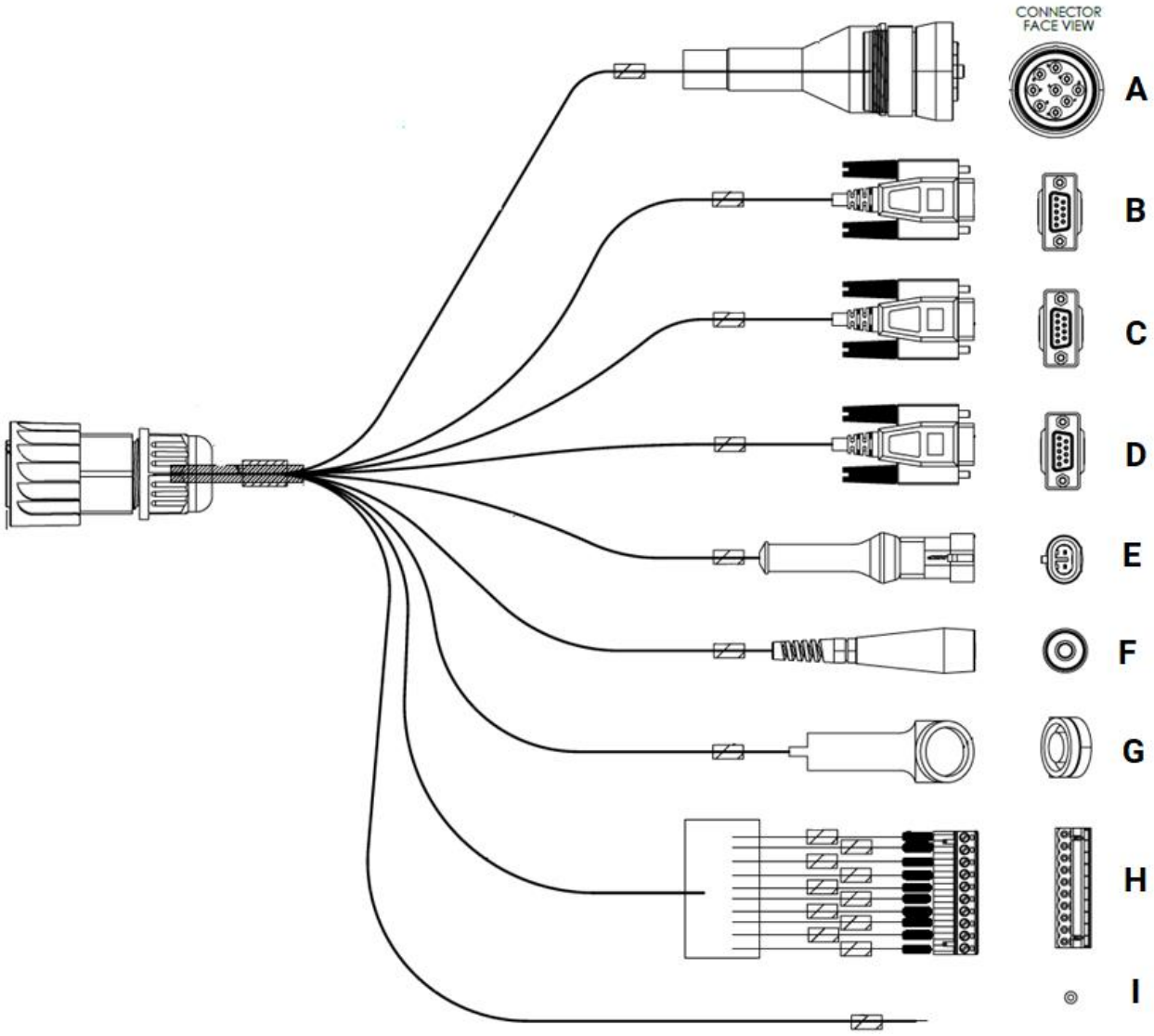



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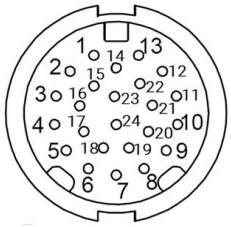
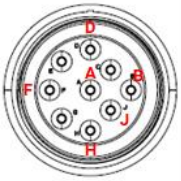
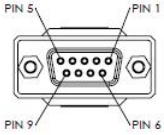
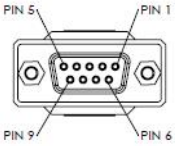
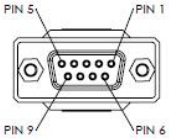
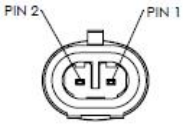
Table 7: Development Cable Connectors

| Transceiver Connector | End A | End B | End C | End D | End E |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| PIN 9 - 1Wire Com | | | | | |
| PIN 10 - RS232 TX | | PIN 2 | | | |
| PIN 21 - RS232 RX | | PIN 3 | | | |
| PIN 22 - AUX RS232 TX | | | PIN 2 | | |
| PIN 13 - CAN 1 Low | PIN D | | | | |
| PIN 14 - CAN 0 Low | PIN J | | | | |
| PIN 1 - RS485 A | | | | PIN 1 | |
| PIN 24 - Dig IN 2 | | | | | |
| PIN 16 - Dig IN 1 | | | | | |
| PIN 4 - I/O_4 | | | | | |
| PIN 5 - I/O_2 | | | | | |
| PIN 6 _ Ground | PIN A and PIN E | PIN 5 | PIN 5 | PIN 5 | PIN 2 |
| PIN 7 - VEXT | PIN B | | | | PIN 1 |
| PIN 8 - Out 6 | | | | | |
| PIN 18 - I/O_1 | | | | | |
| PIN 17 - I/O_3 | | | | | |
| PIN 3 - Dig IN 3 | | | | | |
| PIN 15 - RS485 B | | | | PIN 2 | |
| PIN 23 - CAN 0 High | PIN H | | | | |
| PIN 12 - CAN 1 High | PIN C | | | | |
| PIN 11 - AUX RS232 RX | | | PIN 3 | | |
| PIN 20 - 1Wire Data | | | | | |
| PIN 19 - Out 5 | | | | | |
| PIN 2 - Dig IN 4 | | | | | |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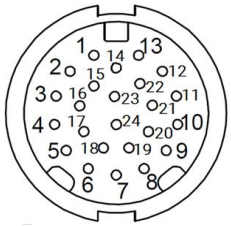
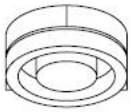
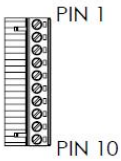
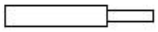
| Transceiver Connector | End F | End G | End H | End I |
|---|---|---|---|---|
|  |  |  |   |  |
| PIN 9 - 1Wire Com | | 1Wire Common | | |
| PIN 10 - RS232 TX | | | | |
| PIN 21 - RS232 RX | | | | |
| PIN 22 - AUX RS232 TX | | | | |
| PIN 13 - CAN 1 Low | | | | |
| PIN 14 - CAN 0 Low | | | | |
| PIN 1 - RS485 A | | | | |
| PIN 24 - Dig IN 2 | | | PIN 8 | |
| PIN 16 - Dig IN 1 | | | PIN 7 | |
| PIN 4 - I/O_4 | | | PIN 4 | |
| PIN 5 - I/O_2 | Input 1 | | | |
| PIN 6 _ Ground | Ground | | PIN 2 | |
| PIN 7 - VEXT | | | PIN 1 | |
| PIN 8 - Out 6 | | | PIN 6 | |
| PIN 18 - I/O_1 | | | | I/O_1 |
| PIN 17 - I/O_3 | | | PIN 3 | |
| PIN 3 - Dig IN 3 | | | PIN 9 | |
| PIN 15 - RS485 B | | | | |
| PIN 23 - CAN 0 High | | | | |
| PIN 12 - CAN 1 High | | | | |
| PIN 11 - AUX RS232 RX | | | | |
| PIN 20 - 1Wire Data | | 1Wire Data | | |
| PIN 19 - Out 5 | | | PIN 5 | |
| PIN 2 - Dig IN 4 | | | PIN 10 | |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**Project:**

**Northland Regional Council**

May 31, 2021

# OPTIONS

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WARNING SYSTEM SOLUTIONS

GIANT VOICE®

EMERGENCY SYSTEMS

*GV-CORE-NANO*
*Right, fast and simple decisions in critical situations*


Mounting optional GV-CORE-NANO-RM

# MINI CONTROL UNIT
## GV-CORE-NANO

The GV-CORE-NANO is a device integrating the standard interacting functions of a system and its operators with advanced warning, communications and process automation functions. It can be implemented as a simple activation panel saving costs and space significantly.
The GV-CORE-NANO is the ideal device for activate tones, pre-recorded messages and Public Address in real time. With the touch interface you can manage the entire siren network communication.
The functionality of the GV-CORE-NANO control unit is given by the applications it contains, which are supplied according to a client's needs and selection. These applications are designed to be mutually and directly interconnected into the complex whole. Depending on the applications combinations, it is possible to create a tailor-made solution to suit a specific client.

## FEATURES

- Touch screen control
- Friendly interface for user
- Activation of the desired tone by groups of sirens, individually or to the entire network
- Redundant and simultaneous communication controls: Radio, GSM, SAT, IP
- Checking the correct communication with the different sirens on different channels
- Access restricted by security codes
- Restriction of allowed functions according to entered code
- Possibility of integration with GV-EMS Emergency management system
- Desk top or rack mounting version

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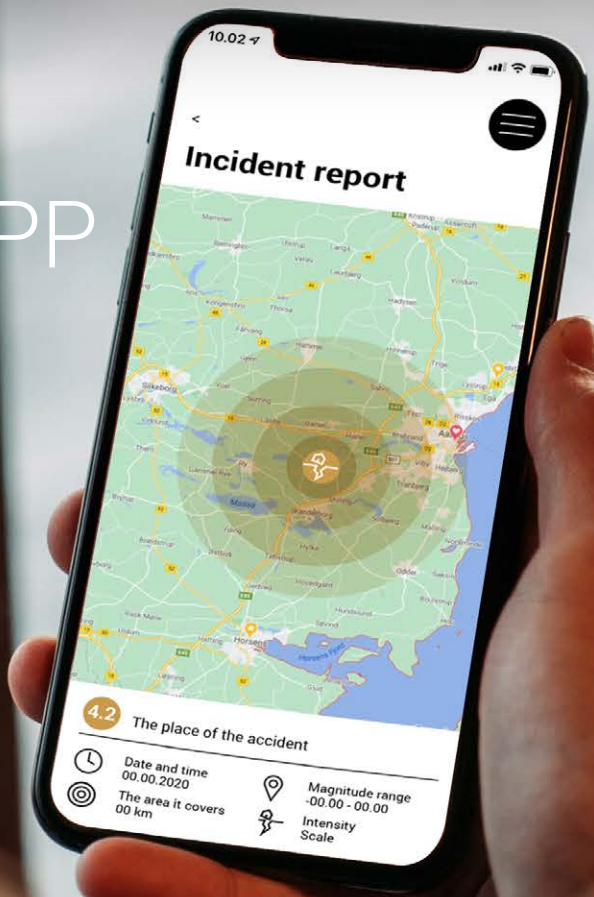
# MONITORING MANAGEMENT CONTROL

## MOBILE APP

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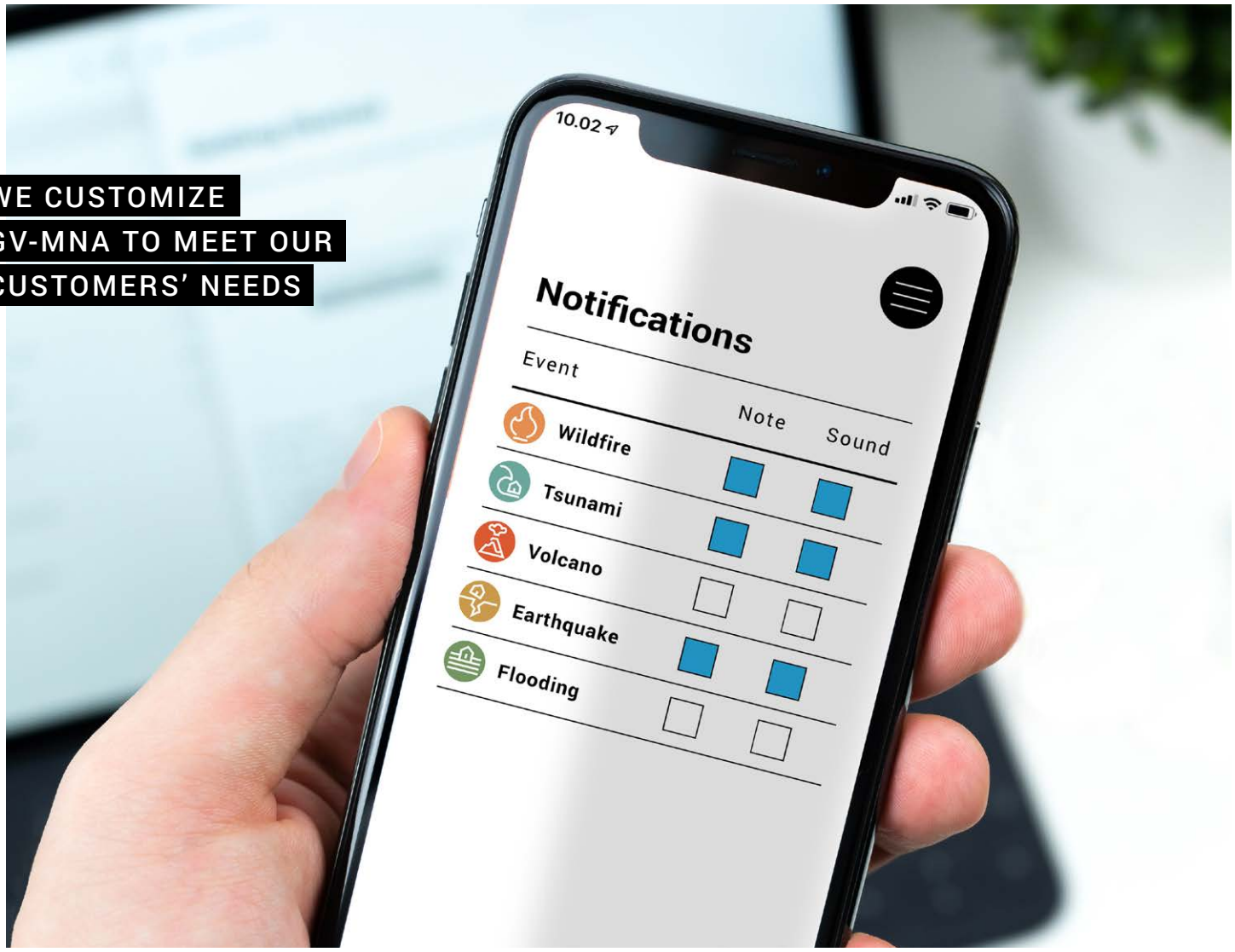
# ALLOWS YOU TO SEND URGENT INFORMATION TO YOUR EMPLOYEES OR CITIZENS




The mobile app Giant Voice® Mass Notification App, is an emergency alert system which allows you to send and receive information to your employees or citizens. The App has a user-friendly interface and has the ability to receive all kinds of alerts in a matter of seconds. We focus on alerting your staff or population regarding the emergency such as natural disasters, industrial disasters or a simple informative notification. The user can configure the type of notification depending on geographic area and type of emergency.

If alarms are activated because of a threat, your organization will be notified promptly via emergency alerts, that will inform you to evacuate towards a safer location.

Giant Voice® Mass Notification App provides a cost-effective solution with real-time messaging that can be used by any organization. The Giant Voice® Mass Notification App provides the ability to send and receive thousands of messages in seconds via SMS, Push Notification, and E-mail.

# GIANT VOICE®

EMERGENCY SYSTEMS

## ALERTS PEOPLE TO POSSIBLE DANGER

## ORDERING INFORMATION

**Product Description**
Mini control unit
**Order No.**
GV-CORE-NANO

**Option**

**Product Description**
Rack mounted mini control unit
**Order No.**
GV-CORE-NANO-RM

REV. B

## APPLICATIONS

- Critical infrastructures (Dams, waterworks and civil protection facilities)
- Emergency services (fire-fighting, rescue units and police stations)
- Security services (banks, insurance companies and shopping centers)
- PA systems

## TECHNICAL DATA

| | |
|---|---|
| **Input voltage** | 12V |
| **Available ports** | Audio 600 Ω balanced output, RS-232 serial, Ethernet and isolated contact inputs (optional) |
| **Communications** | Radio, GSM, SAT, IP |
| **Mounting** | Horizontal or vertical on the wall |
| **Material** | Aluminum front |
| **Operating temperature** | -25° C – +65° C |
| **Dimensions** | Width: 250 cm (98.43")<br>Height: 180 cm (70.87")<br>Depth: 80 cm (31.50") |
| **Weight** | Approx 1 kg |

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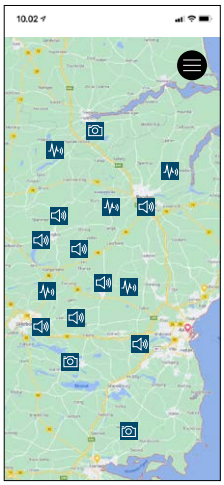
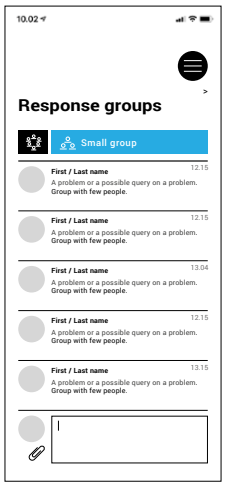
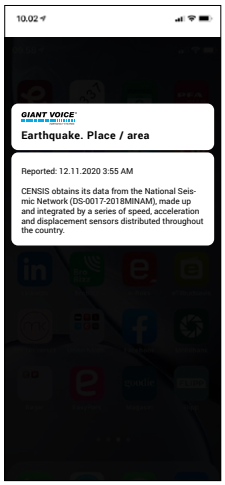
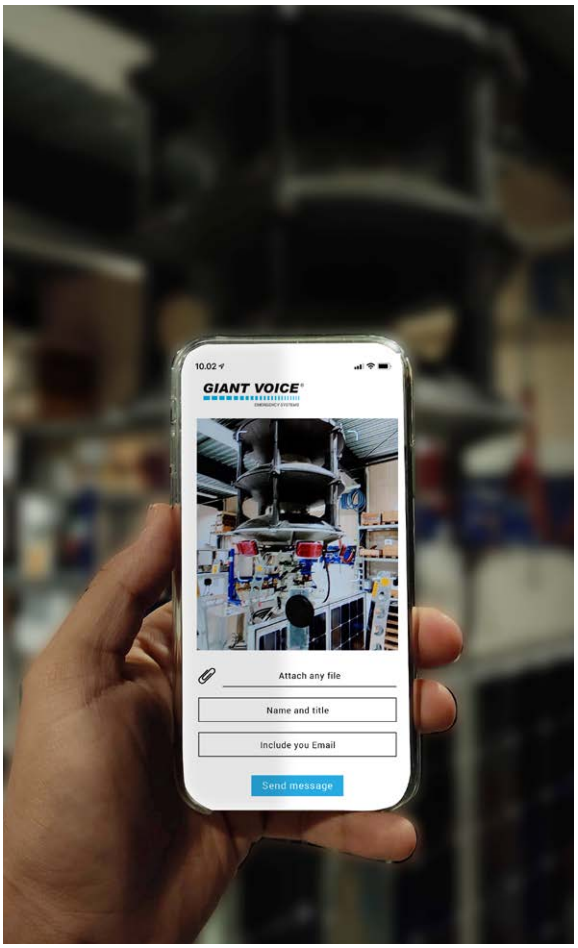
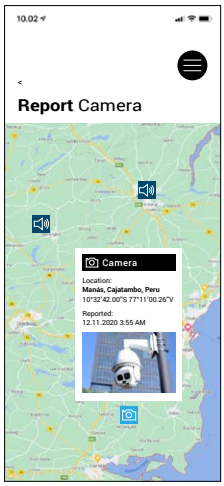
# PERSONALIZED NOTIFICATIONS

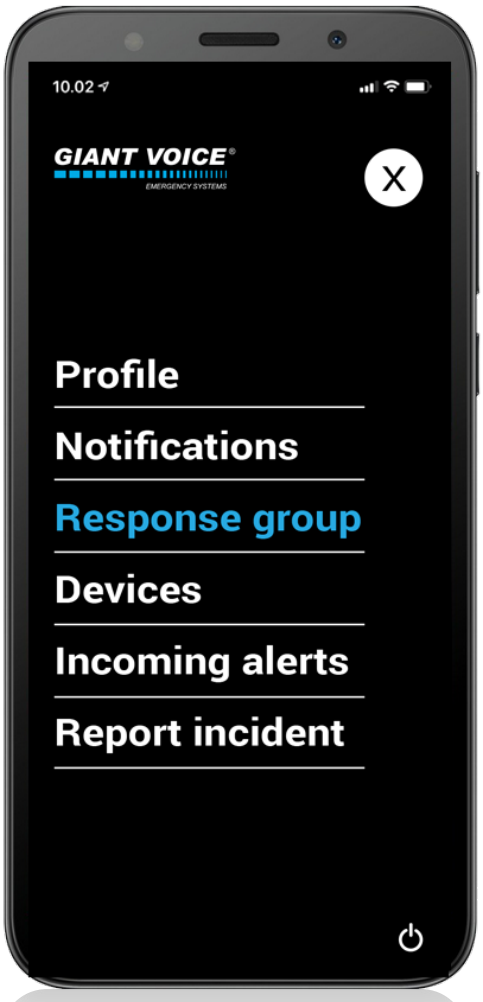


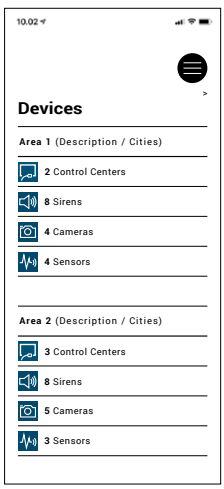


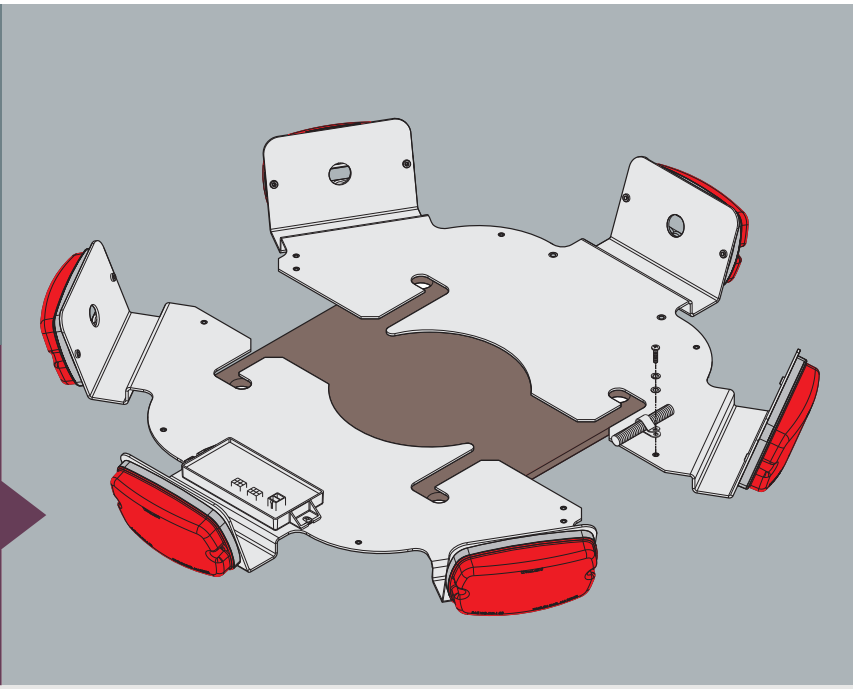




## FEATURES

- Compatible with GV-EMS platform
- Apple: The lastest version and 35 MB free space
- Android: The lastest version and 35 MB free space
- Specific emergency status
- Notification depending on location
- Device status
- Unlimited number of users
- Notification of situation awareness
- Device failure notification
- Convertible web subscription
- Geo-location of personal
- Send and receive information

*Omni-directional six lighthead Super-LED VisuAlert*



# VISUAL LED WARNING
## TWS-VISUALERT

Enhance your Voice and Siren Mass Notification System with an optional visual component: The Omni-directional Visual Lighting for TWS-290 & OA Series.

### ORDERING INFORMATION

**Product Description**
TWS-Valert LED Light Cluster Accessory for TWS Series.
**Order No.**
TWS-VALERT*

**Options**

**Product Description**
LED Controller
**Order No.**
LEDCTRL

* Denotes color Code:
A-Amber, B-Blue, C-Clear (white), R-Red.
REV. F

### FEATURES

- VisuAlert Super-LED® mounts under a TWS-290 or Omni-Alert system
- Complete 360° highly effective LED warning
- VisuAlert illuminates with a designed flash pattern when siren is activated
- Cluster of six LED Whelen M6 Series warning lightheads, 24 VDC
- All connections are waterproof
- All wiring is encased in protective sheathing, anchored to brackets to protect from damage
- Available in Red, Blue, White (Clear) or Amber
- Light source control module fully encapsulated and weatherproof
- Light source control module provides flash pattern selection and light synchronization
- Light source module covered by Whelen's two year warranty
- Bracket supports are 300 Series aluminium alloy in a high strength
- VisuAlert can be adapted to older ESC2020-controlled sirens
- 1.2 amps per light source @ 24 VDC.
- 2.5 amps total current draw when VisuAlert is operating
- Light source is greater than 6000 peak candela
- 84 flashes per minute
- M6 Series lighthead dimensions: 109 mm H x 170 mm W x 35 mm D
- Weight: 12 kg
- IP rating: IP-66
- Operation temperature: -40° C to + 75° C

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# GIANT VOICE®

EMERGENCY SYSTEMS

*The flexible alternative for temporary warning installation*

The Giant Voice® Deployable Unit is a flexible alternative for temporary warning system installation designed to meet your requirements even in harsh environments.

# DEPLOYABLE UNIT

## GV-DPU

Featuring the TWS-292 high power voice and siren system. This Deployable Unit provides a 360° superior coverage. The GV-DPU is easy to handle and the solid supporting legs make it possible to extend the 6-meter lockable pneumatic telescopic mast on rough ground. The deployable unit is equipped with 2 x 100 W solar panels as well as a universal AC charger for recharging the batteries. This is a flexible solution that allows you to charge your deployable unit whenever it is needed. The deployable unit is equipped with a 25 W radio (VHF or UHF) and can be activated remotely from any Giant Voice® Control Centre equipment.
The Giant Voice® Deployable Unit meets NATO standard requirements and can easily be moved to any site with a forklift or similar machine for fast and reliable warnings. The chassis has been designed to reduce freight volume plus transportation costs and to improve handling and easy installation.

### FEATURES

- TWS-292 - two omni-directional speaker cells
- 6-meter lockable pneumatic telescopic mast
- Two compartment aluminum cabinet
- 25 Watts 2-way radio incl. omni-directional 0dB gain antenna
- Local push button panel
- Solar Panel charging
- 115/230 VAC charging possibility
- UFC 4-021-01 compliant
- CAP (Common Alerting Protocol) compliant
- IPAWS compliant

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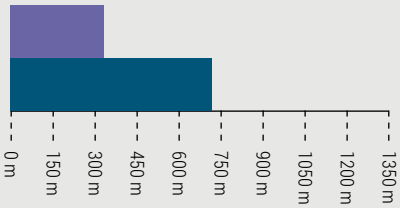
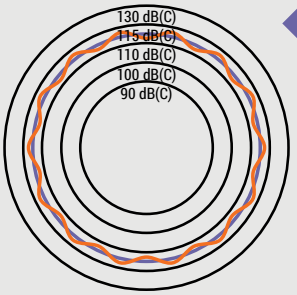
## ACOUSTIC PERFORMANCE

**SPL @ 30 m:** 115dB(C)
**Estimated 80dB range:** 366 m
**Estimated 70dB range:** 731 m




Note: 30 m performance levels listed represent repeatable results within +/-2 dB to stated levels. Estimated 80 dB perimeter is based on the Federal Emergency Management Agency's (FEMA) -10 dB per distance doubled path model.




The superior design of the speaker cluster provides a true 360° high sound output throughout the entire frequency range.

## ENVIRONMENTAL

| | |
|---|---|
| **Operating Temperature** | -35° C to +60° C |
| **Storage Temperature** | -65° C to +125° C |
| **Humidity, Non-Condensing** | 0 to 95% |

## TECHNICAL DATA

| | |
|---|---|
| **Output** | 115 dB(C) @ 30 meters/100' |
| **Endurance** | Minimum 30 minutes of full power output with our recommended batteries |
| **Standard Tones** | Wail, Whoop, Attack, Hi-Lo, Alert, Airhorn plus Public Address |
| **System Test/Supervision** | SI-Test®, Low Battery Alarm and more |
| **Siren output (tones)** | 800 Watts |
| **Siren output (voice)** | 1000 Watts |
| **Standby current** | 40 mAmp |
| **Power input** | 2 x 100 Watts solar panels or 110/220 VAC |
| **Batteries** | 2 x 12 V 70 AH batteries (included) |
| **Dimensions** | Height: 252 cm Height erected: 660 cm<br>Length: 113 cm<br>Width: 113 cm<br>Weight: 500 kg |
| **Operating temperature** | -35°C to 60°C (-31°F to 140°F ) |
| **Storage temperature** | -65°C to 125°C (-85°F to 267°F) |
| **Humidity, non-condensing** | 0 to 95% |
| **Wind speed** | Up to 27 m/s (without guide wires) |

## ORDERING INFORMATION

**Product Description**
Giant Voice Deployable Unit V5
**Order No.**
GV-DPU

**Options**

**Product Description**
Communication via UHF/VHF
For more information contact us.

REV. F

## OPTIONS

- **VISU-ALERT:** Cluster of 6 LED lightheads for a complete 360° highly effective warning
- **TWS-TL31R:** Top mounted LED strobe light
- **GV-FLOODLIGHT:** Upgrade your deployable unit with a cluster of LED floodlights for a combined mobile warning and light tower
- **GV-GSM-RTU:** For GSM activation

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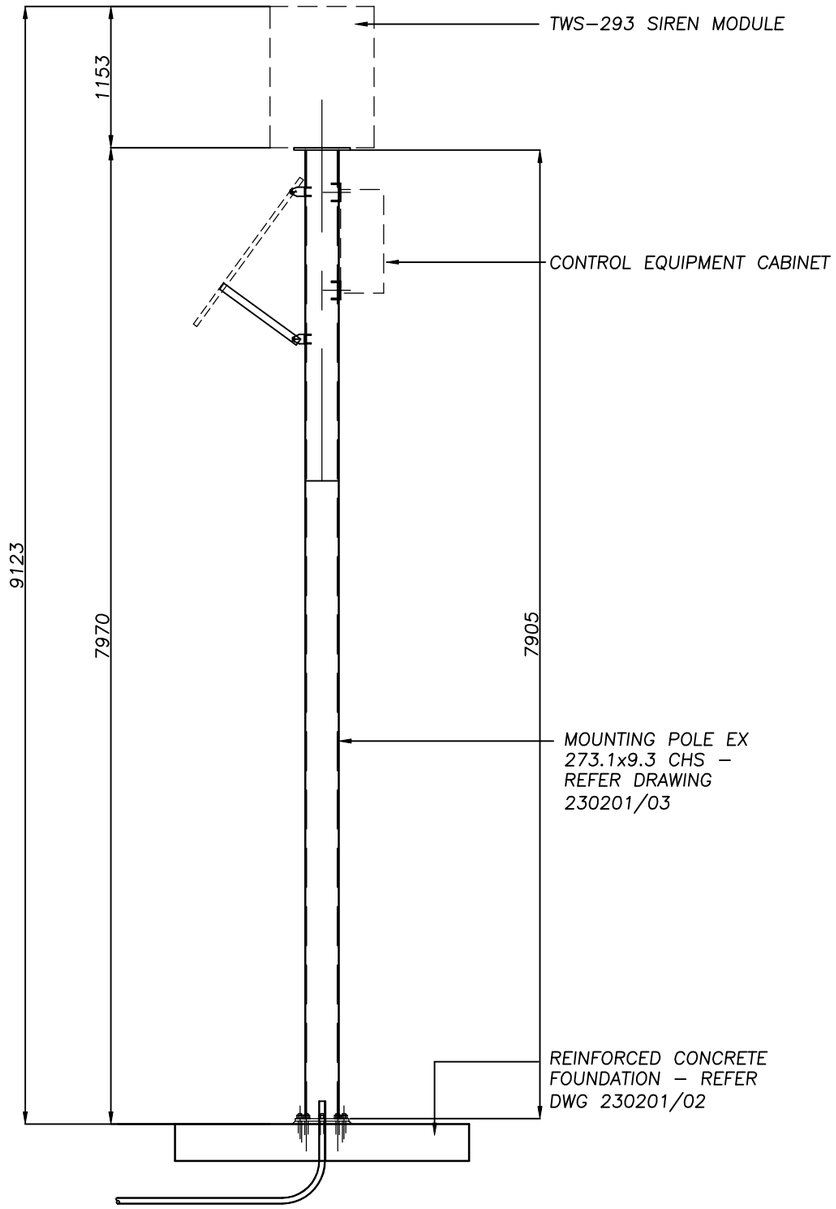
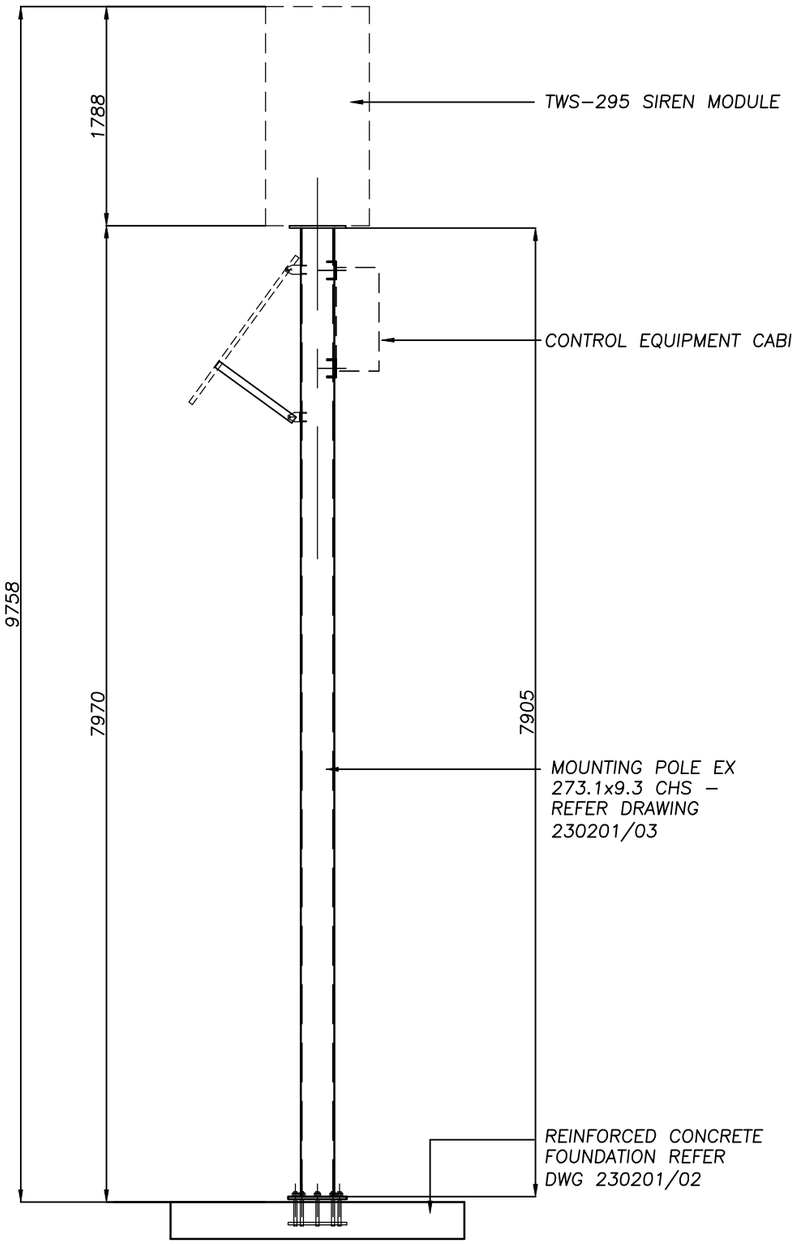



GENERAL ARRANGEMENT – TWS–293 SIREN
1:50




GENERAL ARRANGEMENT – TWS–295 SIREN
1:50

TUTUKAKA CONSULTANTS LIMITED
Consulting Engineers
50 Taonga Lane, Tutukaka
Whangarei 0173
Phone (09) 434 3694, 0221 880 870
E-mail: wayne@tutukakaco.com

Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

client: NORTHLAND REGIONAL COUNCIL

location: VARIOUS IN WHANGAREI, KAIPARA AND FAR NORTH DISTRICTS

SCALES: 1:50

project: NORTHLAND TSUNAMI SIREN NETWORK

drawing title: GENERAL ARRANGEMENT OF SIREN ASSEMBLY, POLE AND FOUNDATION

FILE: nrc-ga drawing01
DATE: 02/23
ORIGINAL SIZE: A3

REVISIONS
A ISSUE FOR CLIENT APPROVAL

DRAWING NUMBER
230201/01
REVISION: A

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23 February 2023

Barker and Associates
Kerikeri CBD
Far North
Northland 0230

**Attention: Makarena Dalton**

Dear Makarena

## TSUNAMI WARNING SIRENS - COMPLIANCE

Barker and Associates has engaged Marshall Day Acoustics to provide advice regarding tsunami warning sirens. The main request is to evaluate the proposed loudspeaker noise level emissions to enable comparison with the relevant District Plan noise limits across Northland.

**We do not consider that District Plan noise rules should typically apply to tsunami warning sirens. We consider that tsunami warning siren noise is effectively a positive noise effect on people. Requiring a tsunami siren to meet a typical daytime or night-time noise residential "noise limit" would not allow the tsunami warning system to work as intended and would not be in the interest of wider society.**

**Tsunami warning sirens are intended to be a loud source of sound. A natural consequence of this is that there could be (and should be) a *technical breach* of a District Plan noise rule (if there is no specific exclusion for emergency sirens within the District Plan rule).**

**We do not consider that there will be any adverse noise effects arising from occasional testing or emergency use of the tsunami warning system where these technically breach any District Plan noise rules.**

Notwithstanding the above, this letter provides initial information on noise emissions that can be used to establish locations in which a technical exceedance of the zone noise limits may occur. The letter is not intended to provide a very high level of detail on noise emissions from each individual loudspeaker tower[1]. We have made a range of assumptions based on previous measurements to establish our design advice. As a result, our conclusions are generalised.

### District plan noise rules: each district has quite different noise limits

We understand that the tsunami sirens are intended to be deployed in the:

- Kaipara District
- Far North District
- Whangarei District

The noise rules in each of these Districts differ even for similar types of zones. For instance, the *Rural Production* daytime noise rule in the Far North District is **65 dB $L_{A10}$** at the site boundary, whereas in Kaipara District the noise limit in the *Rural* zone is **50 dB $L_{Aeq}$** at the notional boundary.

The use of different noise standard descriptors (e.g. $L_{A10}$ vs $L_{Aeq}$), the different numerical noise limits (e.g. 65 dB in the Far North vs 50 dB in Kaipara) and the different assessment position at which the noise limits apply

[1] Noise modelling of the individual loudspeaker towers has not been carried out for this assessment

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(e.g. the site boundary in Far North and the notional boundary in Kaipara) means that it quickly becomes complex to determine where a technical breach of the noise limit will occur in each District.

Because of this we have prepared a "matrix of distances" that the planning assessment can use to estimate the properties where the relevant District Plan noise limits will be exceeded. These are tabulated and appended to this letter.

### Exclusions within the District Plan

Ideally the operation and testing of tsunami warning sirens would be excluded from assessment against the District Plan zone noise limits, as these rules are inappropriate for tsunami sirens.

We note that the Whangarei District Plan make the following statement regarding warning sirens: *"The noise rules shall not apply to the following activities:…The operation of emergency service vehicles or emergency callout sirens."* *"Emergency callout sirens"* is not defined in the District Plan[2] but the words appear to relate directly to the use of a tsunami siren[3] In our view, this clause means that no noise limits apply to tsunami warning siren noise in any zones within Whangarei.

We are not aware of any specific exclusions in Kaipara or Far North District Plans but will review any clauses if provided to us. We recommend tsunami warning noise is excluded from compliance in any future district Plan revisions. We recommend Northland Regional Council submit on this matter or seek a plan change if required.

### We have calculated the distances at which noise levels (in 5 dBA bands) will be complied with

Appendix A to Appendix C gives the approximate distances at which tsunami siren noise will be below specific noise levels. These have been given in 5 dBA tiers for the following scenarios:

**Scenario A:** Daytime testing

**Scenario B:** Daytime emergency operation

**Scenario C:** Night-time emergency operation

Noise levels for $L_{Aeq}$ (Whangarei and Kaipara) and $L_{A10}$ (Far North) are given separately so that the noise levels in each district can be separately evaluated.

The following assumptions have been used in our noise modelling.

- 145 dB $L_{WA}$ based sound power level and omnidirectional source (refer Appendix D for technical details).
- 80% relative humidity. Noise levels in dry air conditions may be slightly lower.
- 80% soft ground at source, middle and receiver distances. Noise levels over hard ground (e.g. water) may be higher.
- Propagation calculated using International Standard ISO 9613-2:1996 *Acoustics - Attenuation of sound during propagation outdoors – Part 2: General method of calculation*. This standard calculated noise in conditions favourable to sound propagation such as downwind or temperature inversion conditions. Noise levels in upwind or temperature lapse conditions will be appreciably lower (refer Appendix E for technical details).
- No acoustic screening will occur. Noise levels behind ridgelines (where there is no line-of-sight to the tsunami siren) or behind buildings will be appreciably lower.

[2] The definitions section states that if a phrase is not defined it should take its common meaning from the concise Oxford English Dictionary.

[3] Tsunami sirens are "calling out" a message and an alarm during an emergency and thus clearly fit within the everyday definition of this clause.

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- Only one siren contributes to the noise level at each receiver.

The appendices show that:

- during **daytime testing** of sirens, the District Plan noise limits may be exceeded at up to 1,600 metres of the individual siren towers in some zones (e.g. rural, residential)
- during **daytime emergency operation,** the District Plan noise limits may be exceeded at up to 3,300 metres in some zones (e.g. residential, rural, coastal, etc.)
- during **night-time emergency operation,** the District Plan noise limits may be exceeded at up to 6,200 metres in some zones (e.g. r residential, rural, coastal, etc.)

Refer to the appendices for more information on the distances at which specific noise levels will occur in each district.

We trust this information is useful. Please contact us if you have any questions.

Yours faithfully

**MARSHALL DAY ACOUSTICS LTD**

**Peter Ibbotson**

**Acoustic Engineer**

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## APPENDIX A DAYTIME TESTING

**Table 1: Distance at which rating noise levels are likely to be met in Kaipara and Whangarei ($L_{Aeq}$ limits) DURING DAYTIME TESTING**

| | **Distance at which rating noise level is met (assessed in accordance with NZS6802:2008). Rating Sound Power Level of 136 dB $L_{WA,eq(15\ min)}$** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **75 dB $L_{Aeq}$** | **70 dB $L_{Aeq}$** | **65 dB $L_{Aeq}$** | **60 dB $L_{Aeq}$** | **55 dB $L_{Aeq}$** | **50 dB $L_{Aeq}$** | **45 dB $L_{Aeq}$** | **40 dB $L_{Aeq}$** |
| **DAY TESTING** | **250m** | **400m** | **600m** | **850m** | **1200m** | **1600m** | N/A | N/A |
| *Kaipara Zone Examples* | ***If emitted from an Industrial zone:*** *Industrial* | | | ***If emitted from a Commercial zone:*** *Commercial* | ***If emitted from an Industrial zone:*** *Residential, Rural, Māori Purpose zone* | ***If emitted from Rural, Residential, Commercial, Māori Purpose:*** *Rural, Residential, Māori Purpose* | | |
| *Whangarei Zone Examples* ***[NOTE THAT EMERGENCY SIRENS EXCLUDED IN THIS PLAN]*** | *Heavy Industrial, Settlement Zone Industrial, SRIZ* | | *Light Industry, Commercial, Sport and Active Recreation, Shopping Centre, Hospital, Airport* | *City Centre, Waterfront[2], Mixed Use, Local Centre, Settlement Centre* | ***If emitted from Port, Settlement, Heavy Industrial, light industrial, commercial, Sport and Active Recreation:*** *Residential, Neighbourhood Centre, Natural Open Space, Open Space,* ***Rural Production, Rural Lifestyle, Settlement, Future Urban.*** ***If emitted from most other zones:*** *Open Space, Rural Production.* | ***If emitted from most other zones:*** *Residential, Neighbourhood Centre, Rural Lifestyle, Settlement, Future Urban* | | |

Notes:

1. Zone examples should be checked by the consultant planner for accuracy. Not all zones in each District are given
2. The District Plans include some errors. If there is question over what limit should apply, we have used our discretion (for instance there are conflicting limits for Rural Production zone in Whangarei)
3. In some Districts, the limit varies depending on the zone the noise source is located in.

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**Table 2: Distance at which rating noise levels are likely to be met in Far North ($L_{A10}$ limits) DURING DAYTIME TESTING**

| | Distance at which rating noise level is met (assessed in accordance with NZS6802:2008). Rating sound power level of 133 dB $L_{WA,10\ (15\ min)}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **75 dB $L_{A10}$** | **70 dB $L_{A10}$** | **65 dB $L_{A10}$** | **60 dB $L_{A10}$** | **55 dB $L_{A10}$** | **50 dB $L_{A10}$** | **45 dB $L_{A10}$** | **40 dB $L_{A10}$** |
| **DAY TESTING** | **180m** | **300m** | **450m** | **700m** | **950m** | **1,400m** | N/A | N/A |
| *Far North Zone Examples* | | | ***If emitted from a Rural Production zone:*** *Rural Production, Residential, Coastal Residential, Russell Township [site boundary]*<br>*- other rural or coastal zone [notional boundary]*<br><br>***If emitted from a Commercial zone:*** *Commercial [site]*<br><br>***If emitted from an Industrial Zone:*** *Industrial [site]* | | ***If emitted from a Rural Living, Commercial, Industrial, Minerals or any Coastal zone:***<br>*- Coastal Residential, Residential, Russell Township [site boundary]*<br>*- any Rural or Coastal zone [notional boundary]* | ***If emitted from a Residential zone:***<br>*- Residential [site boundary]*<br>*- any Rural or Coastal zone [notional boundary]* | | |

Notes:

1. Zone examples should be checked by the consultant planner for accuracy. Not all zones are given.
2. In the FNDC, the limit varies depending on the zone the noise source is located in (for instance if a siren was located in a *Rural Production* zone, it would need to meet 65 dB $L_{A10}$ at another *Rural Production* zone during the day, but if a siren was located in a *Rural Living* zone the limit would be 55 dB $L_{A10}$ at a *Rural Production* zone during the day).

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## APPENDIX B DAYTIME EMERGENCY OPERATION

**Table 3: Distance at which rating noise levels are likely to be met in Kaipara and Whangarei ($L_{Aeq}$ limits) during DAYTIME EMERGENCY OPERATION**

| | Distance at which rating noise level is met (assessed in accordance with NZS6802:2008). Rating Sound Power Level of 145 dB $L_{WA,eq(15\ min)}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **75 dB $L_{Aeq}$** | **70 dB $L_{Aeq}$** | **65 dB $L_{Aeq}$** | **60 dB $L_{Aeq}$** | **55 dB $L_{Aeq}$** | **50 dB $L_{Aeq}$** | **45 dB $L_{Aeq}$** | **40 dB $L_{Aeq}$** |
| **DAY EMERGENCY** | **550m** | **800m** | **1,100m** | **1,500m** | **2,000m** | **2,600m** | N/A | N/A |
| *Kaipara Zone Examples* | ***If emitted from an Industrial zone:*** *Industrial* | | | ***If emitted from a Commercial zone:*** *Commercial* | ***If emitted from an Industrial zone:*** *Residential, Rural, Māori Purpose zone* | ***If emitted from Rural, Residential, Commercial, Māori Purpose:*** *Rural, Residential, Māori Purpose* | | |
| *Whangarei Zone Examples* ***[NOTE THAT EMERGENCY SIRENS EXCLUDED IN THIS PLAN]*** | *Heavy Industrial, Settlement Zone Industrial, SRIZ* | | *Light Industry, Commercial, Sport and Active Recreation, Shopping Centre, Hospital, Airport* | *City Centre, Waterfront[2], Mixed Use, Local Centre, Settlement Centre* | ***If emitted from Port, Settlement, Heavy Industrial, Light Industrial, Commercial, Sport and Active Recreation:*** *Residential, Neighbourhood Centre, Natural Open Space, Open Space, Rural Production, Rural Lifestyle, Settlement, Future Urban.*<br><br>***If emitted from most other zones:*** *Open Space, Rural Production.* | ***If emitted from most other zones:*** *Residential, Neighbourhood Centre, Rural Lifestyle, Settlement, Future Urban* | | |

Notes:

1. Zone examples should be checked by the consultant planner for accuracy. Not all zones in each District are given
2. The District Plans include some errors. If there is question over what limit should apply, we have used our discretion (for instance there are conflicting limits for Rural Production zone in Whangarei)
3. In some Districts, the limit varies depending on the zone the noise source is located in.

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**Table 4: Distance at which rating noise levels are likely to be met in Far North ($L_{A10}$ limits) DAYTIME EMERGENCY OPERATION**

| | Distance at which rating noise level is met (assessed in accordance with NZS6802:2008). Rating sound power level of 150 dB $L_{WA,10\ (15\ min)}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **75 dB $L_{A10}$** | **70 dB $L_{A10}$** | **65 dB $L_{A10}$** | **60 dB $L_{A10}$** | **55 dB $L_{A10}$** | **50 dB $L_{A10}$** | **45 dB $L_{A10}$** | **40 dB $L_{A10}$** |
| **DAY EMERGENCY** | **800m** | **1,100m** | **1,500m** | **2,000m** | **2,600m** | **3,300m** | N/A | N/A |
| *Far North Zone Examples* | | | ***If emitted from a Rural Production zone:*** *Rural Production, Residential, Coastal Residential, Russell Township [site boundary]*<br>*- other rural or coastal zone [notional boundary]*<br><br>***If emitted from a Commercial zone:*** *Commercial [site]*<br><br>***If emitted from an Industrial Zone:*** *Industrial [site]* | | ***If emitted from a Rural Living, Commercial, Industrial, Minerals or any Coastal zone:***<br>*- Coastal Residential, Residential, Russell Township [site boundary]*<br>*- any Rural or Coastal zone [notional boundary]* | ***If emitted from a Residential zone:***<br>*- Residential [site boundary]*<br>*- any Rural or Coastal zone [notional boundary]* | | |

Notes:

1. Zone examples should be checked by the consultant planner for accuracy. Not all zones are given.
2. In the FNDC, the limit varies depending on the zone the noise source is located in (for instance if a siren was located in a *Rural Production* zone, it would need to meet 65 dB $L_{A10}$ at another *Rural Production* zone during the day, but if a siren was located in a *Rural Living* zone the limit would be 55 dB $L_{A10}$ at a *Rural Production* zone during the day).

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## APPENDIX C NIGHT-TIME EMERGENCY OPERATION

**Table 5: Distance at which rating noise levels are likely to be met in Kaipara and Whangarei ($L_{Aeq}$ limits) during NIGHT-TIME EMERGENCY OPERATION**

| | **Distance at which rating noise level is met (assessed in accordance with NZS6802:2008). Rating sound power level of 150 dB $L_{WA,eq\ (15\ min)}$** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **75 dB $L_{Aeq}$** | **70 dB $L_{Aeq}$** | **65 dB $L_{Aeq}$** | **60 dB $L_{Aeq}$** | **55 dB $L_{Aeq}$** | **50 dB $L_{Aeq}$** | **45 dB $L_{Aeq}$** | **40 dB $L_{Aeq}$** |
| **NIGHT EMERGENCY** | **800m** | **1,100m** | **1,500m** | **2,000m** | **2,600m** | **3,300m** | **4,200m** | **5,100m** |
| *Kaipara Zone Examples* | ***If emitted from an Industrial zone:*** *Industrial* | | | ***If emitted from a Commercial zone:*** *Commercial* | | | ***If emitted from an Industrial zone:*** *Residential, Rural, Māori Purpose zone* | ***If emitted from Rural, Residential, Commercial, Māori Purpose:*** *Rural, Residential, Māori Purpose* |
| *Whangarei Zone Examples* ***[NOTE THAT EMERGENCY SIRENS EXCLUDED IN THIS PLAN]*** | *Heavy Industrial, Settlement Zone Industrial, SRIZ* | | | *Light Industry, Commercial, Sport and Active Recreation, Shopping Centre, Hospital, Airport* | *City Centre, Waterfront*[2] | *Mixed Use, Local Centre, Settlement Centre*<br><br>***If emitted from most other zones:*** *Residential, Neighbourhood Centre, Rural Lifestyle, Settlement, Future Urban* | ***If emitted from Port, Settlement, Heavy Industrial, Light Industrial, Commercial, Sport and Active Recreation:*** *Residential, Neighbourhood Centre, Natural Open Space, Open Space.* | ***If emitted from most other zones:*** *Open Space, Rural Production, Residential, Neighbourhood Centre, Rural Lifestyle, Settlement, Future Urban* |

Notes:

1. Zone examples should be checked by the consultant planner for accuracy. Not all zones in each District are given
2. The District Plans include some errors. Where there is question over what limit should apply, we have used our discretion (for instance there are conflicting limits for Rural Production zone in Whangarei)
3. In these districts, the limit varies depending on the zone the noise source is located in.

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**Table 6: Distance at which rating noise levels are likely to be met in Far North ($L_{A10}$ limits) during NIGHT-TIME EMERGENCY OPERATION**

| | Distance at which rating noise level is met (assessed in accordance with NZS6802:2008). Rating sound power level of 155 dB $L_{WA,10\ (15\ min)}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **75 dB $L_{Aeq}$** | **70 dB $L_{Aeq}$** | **65 dB $L_{Aeq}$** | **60 dB $L_{Aeq}$** | **55 dB $L_{Aeq}$** | **50 dB $L_{Aeq}$** | **45 dB $L_{Aeq}$** | **40 dB $L_{Aeq}$** |
| **NIGHT EMERGENCY** | **1,100m** | **1,500m** | **2,000m** | **2,600m** | **3,300m** | **4,200m** | **5,100m** | **6,200m** |
| *Far North Zone Examples* | | | | | ***If emitted from a Commercial zone:*** *Commercial [site]*<br><br>***If emitted from an Industrial Zone:*** *Industrial [site]* | | ***If emitted from a Rural Production zone:*** *Rural Production, Residential, Coastal Residential, Russell Township [site boundary] - other rural or coastal zone [notional boundary]*<br>***If emitted from a Commercial, Industrial, Coastal or Residential zone:*** *- Residential, Coastal Residential, Russell Township [site boundary] - other rural or coastal zone [notional boundary].* | |

Notes:

1. Zone examples should be checked by the consultant planner for accuracy. Not all zones are given.

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## APPENDIX D SIREN SYSTEM SELECTIONS:

We do not expect the siren systems to deliver the sound pressure levels claimed (when considered as an $L_{Aeq(t)}$ level). Two siren system models are proposed to be used. These are the HSS Engineering TWS-293 and TWS-295. The manufacturer datasheet provides the following acoustic data:

- TWS-293 149 dBC @ 1m, 119 dBC @ 30m
- TWS-295 153 dBC @ 1m, 123 dBC @30m

The District Plan limits use "A-weighting" whereas the stated HSS Engineering data sheets state sound pressure levels in terms of "C-weighting". Our evaluation of other tsunami siren tests is that there is a negligible difference between the A- and C-weightings when measured in the field (less than 1 decibel of difference within 50 metres of the sirens). On this basis, we consider that any C-weighted specification can simply be read as an A-weighted level[4].

The HSS Engineering sound pressure levels given are determined in accordance with ISO13475-1. This standard provides a test methodology for measurement of loudspeaker level. However the level stated by the manufacturer does not clarify whether the stated level is given in terms of $L_{AFmax}$, $L_{Aeq(t)}$ or perhaps some other value such as $L_{Cpeak}$. The relevant District Plan noise limits are given in $L_{Aeq}$ (or $L_{A10}$ in the case of Far North)[5] and it is necessary to evaluate noise using these parameters[6].

We consider it likely that the level quoted by HSS refers to the $L_{AFmax}$ (or possibly a $L_{Zpeak}$) noise level measured using a test signal in standardised conditions – we do not expect that the siren systems could generate $L_{Aeq}$ noise levels over the duration of the test signal at sound pressure levels of 119 to 123 dB at 30 metres. Such noise levels would be extremely high and would be very unpleasant (and potentially debilitating) to anyone within 50 metres of the sirens who was not wearing hearing protection.

Our experience with similarly designed siren systems operating in the field is that sound pressure levels will be in the order of 80 - 82 dB $L_{Aeq\,(1\,min)}$ at 150 metres and around 90 - 91 dB $L_{Aeq\,(1\,min)}$ at 75 metres during tests[7]. This can be conservatively modelled as a sound power level of 145 dB $L_{WA,eq\,(1\,min)}$[8]. Based on our experience, we have calculated noise emissions, for this assessment, based on a simple omnidirectional loudspeaker with the following sound power level:

**Table 7: Octave Band Noise Level Results**

| | Sound Power Level dB $L_{WA,eq\,(1\,min)}$ Octave Band Centre Frequency (Hz) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Source** | **63** | **125** | **250** | **500** | **1000** | **2000** | **4000** | **dBA** |
| HSS Loudspeakers (used both TWS-295 and TWS-293) | - | - | - | 140 | 140 | 140 | - | 145 |

[4] The warning signal is broadly composed of a sweep of frequencies from around 500 to 2 kHz and as such there is little difference between A and C weighted levels.

[5] The $L_{A10}$ and $L_{Aeq}$ noise levels are numerically quite similar, whereas $L_{AFmax}$ and $L_{Zpeak}$ levels are numerically much higher.

[6] The District Plan night-time rules also have limits on $L_{AFmax}$ noise levels. However in the case of a tsunami warning siren, the $L_{A10}$ or $L_{Aeq}$ night -time rules would control where a technical breach will occur.

[7] $L_{AFmax}$ noise levels would be around 14 decibels higher than this and $L_{Zpeak}$ levels would be around 21 decibels higher than this

[8] The sound power level is the amount of sound energy produced if you conceptualise the source as a very small point. As sound levels drop with respect to distance, you get the quoted sound pressure levels ($L_{Aeq}$ or $L_{A10}$) at different distances. In this case with respect to a 145 dB $L_{WA}$, it allows for a small safety factor as this sound power level would return a sound pressure level of around 88 dB $L_{Aeq\,(1\,min)}$ at 150 metres from the base of the loudspeaker support

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## APPENDIX E CALCULATIONS IN ACCORDANCE WITH NZS6802

All District Plans reference New Zealand Standard NZS6802[9]. This standard sets out how environmental sound should be assessed in New Zealand for typical environmental sources.

The NZS6802 standard is not particularly well suited to the assessment of tsunami siren noise. However the District Plan requires the use of this standard and thus we have used it based on the following assumptions:

**Testing**

- The swept-sine nature of the siren would be subjectively tonal (but not objectively tonal) and a special audible characteristics correction of + 5dBA should therefore apply to all testing and operation.
- The NZS6802:2008 assessment period is 15 minutes. **Testing** of the tsunami sirens during the daytime has previously involved two cycles of around one minute of tsunami alarm signal (two minutes of signal in total). This correlates to a rating sound power level of 136 dB $L_{WA,eq(15\ min)}$ and 133 dB $L_{WA,10\ (15\ min)}$[10]
- A duration correction for a 15-hour day period can be used. A duration correction of -5 decibels would be appropriate during the day in all districts.
- Testing would occur twice per year during the statutory daytime. Testing of sirens would not occur at night.

**Operation (Emergency Evacuation)**

- During emergency operation (i.e. in an emergency tsunami evacuation) it is assumed that the siren could operate for at least a full 15-minute assessment period but for less than 5 hours of the day period. A full duration correction is considered appropriate during the daytime. This correlates to a rating sound power level of 145 dB $L_{WA,eq(15min)}$ and 150 dB $L_{WA,10\ (15\ min)}$[11].
- No duration correction can be applied at night. This correlates to a rating sound power level of 150 dB $L_{WA,eq(15min)}$ and 155 dB $L_{WA,10\ (15\ min)}$[12].

[9] The Far North District Plan still references the 1991 version of the standard, even though this was superceeded in 2008. The Kaipara and Whangarei District Plan versions reference the current 2008 version of the standard. An important difference between the standard is the way that special audible characteristics are applied. The 1991 version reduces the limit by 5 dBA, whereas the 2008 version adds a 5 decibel penalty to the assessed noise level. Both approaches are effectively the same, but use a different methodology. To avoid confusion in this assessment we have used the 2008 approach and added any special audible characeristics correction to the assessed noise level.

[10] This is the sound power level over a fifteen-minute period when the periods of noise (2 minutes) and quiet (13 minutes) are included. The $L_{A10}$ value is less than the $L_{Aeq}$ level as the signal is only present for two minutes of the fifteen-minute test period during the daytime – this has been determined from previous measurements carried out of tsunami siren operation elsewhere in NZ. The rating sound power level includes the SAC and duration correction for the day period.

[11] This is the sound power level assuming the siren operates continuously (warning alarm with speech between) for less than five hours during an evacuation. The $L_{A10}$ value is higher than the $L_{Aeq}$ value as the periods of louder noise (alarm) are present for longer during the assessment period. The rating sound power level includes the SAC and duration correction for the day period.

[12] This is the sound power level assuming the siren operates continuously (warning alarm with speech between) over any 15-minuite period at night. It is the same as the daytime sound power level, but without any -5 decibel duration correction.

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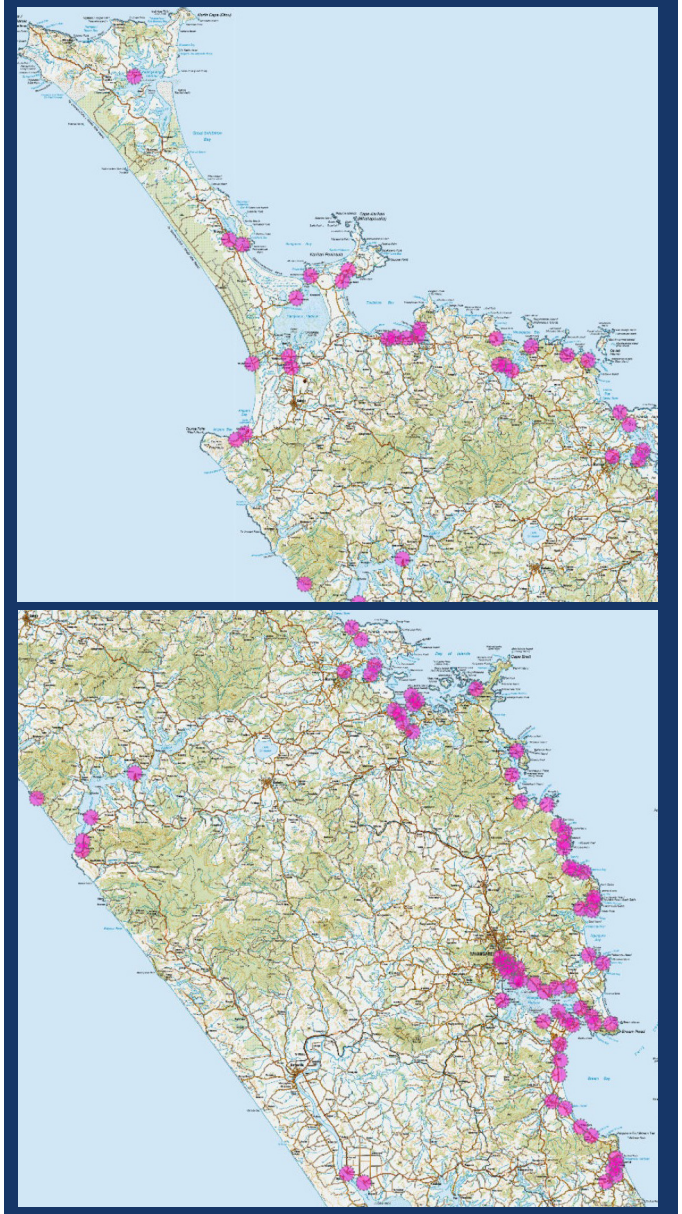
# New Siren Coverage Maps



**Legend**

Approximate siren sound coverage

NORTHLAND EMERGENCY MANAGEMENT GROUP

CIVIL DEFENCE

GET READY .govt.nz

National Emergency Management Agency
Te Rākau Whakamarumaru

www.civildefence.govt.nz

Northland REGIONAL COUNCIL

www.nrc.govt.nz

0800 002 004

Whangarei District Council

www.wdc.govt.nz

0800 002 004

Kaipara te Oranganui
KAIPARA DISTRICT
Two Oceans Two Harbours

www.kaipara.govt.nz

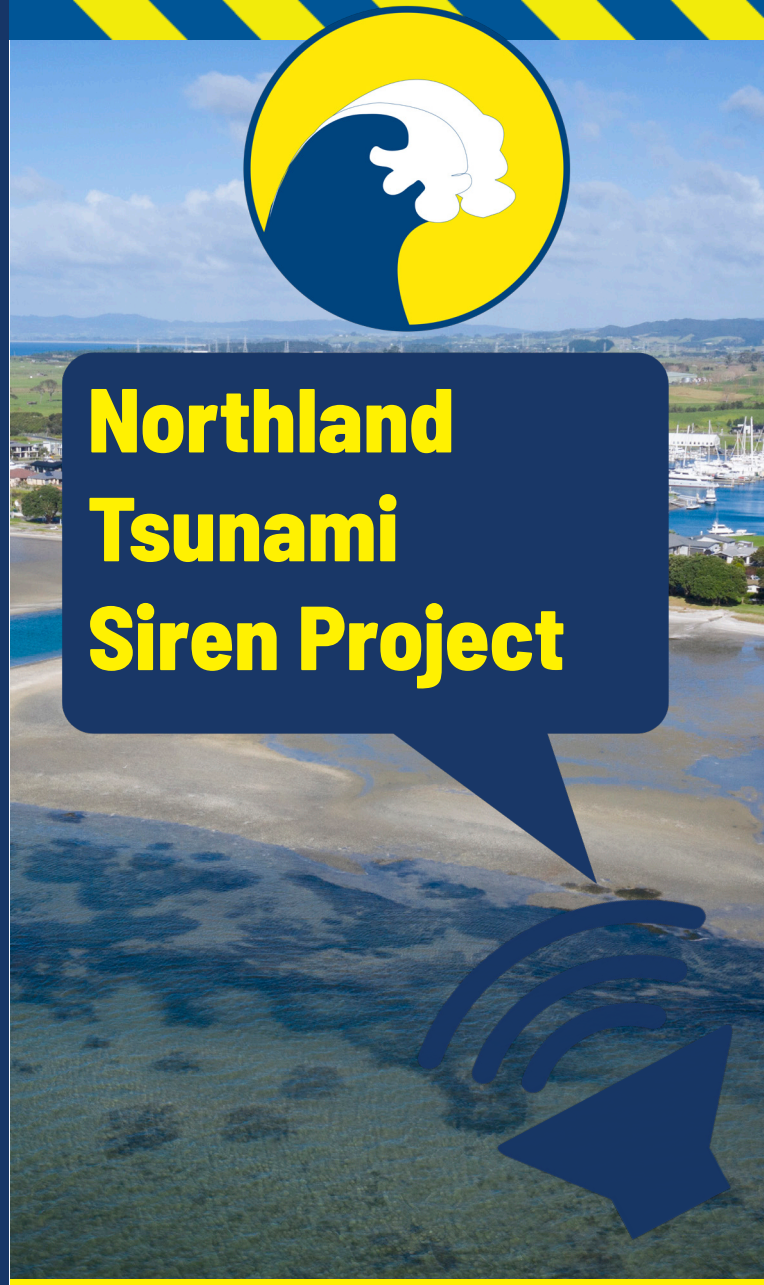
0800 727 059

Far North District Council
Te Kaunihera o Tai Tokerau ki te Raki

www.fndc.govt.nz

0800 920 029

GNS SCIENCE TE PŪ AO



# Northland Tsunami Siren Project

## WHAT YOU NEED TO KNOW

**Northland's tsunami sirens are being replaced**

**FIND OUT MORE INSIDE**

## Tsunami sirens in Northland

The current Northland tsunami siren network is made up of over 200 sirens located along Northland's coastline.

This network is an initial warning system to alert coastal communities of distant source Tsunami threats.

The sirens are owned by the local District Councils and managed by the Northland Civil Defence Emergency Management Group on behalf of all Northlanders.

The current system is coming to the end of its expected life and is set to be replaced with up-to-date technology.

Some areas across Northland that cannot hear the outdoor sirens also have indoor sirens. These are activated simultaneously with the outdoor sirens.

## What to do when you hear a tsunami siren?

Always remember, tsunami sirens are just one part of a range of formal and informal warning systems, any of which can alert people to a tsunami.

When there is a tsunami warning the siren will sound intermittently. This is a strong signal to

**SEEK FURTHER INFORMATION.**

## Evacuation maps

Find out if you live, work, or play in a tsunami zone so you can plan your evauation route ahead of time.

Go to www.nrc.govt.nz/tsunami to view our interactive maps.


Current Northland tsunami sirens

## Tsunami siren replacement project

To help better protect Northlanders against the threat of Tsunami and meet the new siren guidelines, a joint project was initiated by all four Northland councils, to replace the existing sirens with new models that are standard compliant. The project is set to replace the current sirens with 96 new sirens – starting in 2023 and rolling out over the next couple of years.

The new sirens are quite different from the existing ones. They have much greater sound coverage, can provide voice messaging as well as multi-tone siren sounds, have back-up solar power, and are activated separately from the mains power via the cell phone network or satellite.

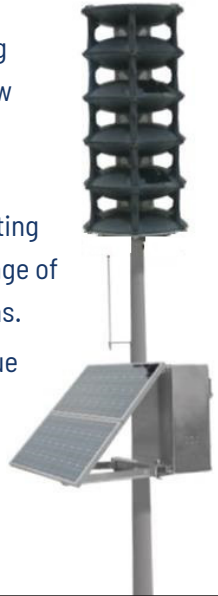
As they are independent of the power grid, they will also be on their own poles, and because they have greater sound coverage, we'll require fewer sirens in fewer, more effective locations.

The Northland Civil Defence Emergency Management Group has been working with the siren suppliers – HSS Engineering – to identify the best locations for the new sirens that will provide the best coverage across the region.

However, the project remains about updating what we have, while improving the coverage of existing areas, not adding additional areas.

The current indoor sirens will also continue to be activated simultaneously with the outdoor sirens for the forseeable future.

For more information on the project head to: www.nrc.govt.nz/tsunami



Example of new tsunami siren

## Seeking further information

Whether it's the current sirens or the new sirens, when you hear one, the first thing to do is to seek further information. Here are some of the key places to check:

- Emergency Mobile Alert or Red Cross Hazard App notification. Find out more at: www.nrc.govt.nz/cdalert
- Northland Civil Defence Facebook page (civildefencenorthland)
- Northland council websites, such as www.nrc.govt.nz/civildefence
- TV and Radio
- Other social media sites

Follow the instructions given by Civil Defence and spread the word to people you think may be at risk.

Remember, tsunami sirens don't necessarily mean you need to evacuate the area right away. They do mean you need to find out what the level of threat is.

Make sure you stay up-to-date and check multiple sources during the alert if you can. No single source of information works for everyone, so make sure you share any official alerts with others – especially those you know are isolated.

## Natural warnings

For a local source tsunami, which could arrive in minutes, there won't be time for an official warning. It is important to recognise the natural warning signs and act quickly.

If you experience:

Out of the ordinary sea behaviour, such as sudden sea level rise or fall and/or an unusual noise.

A strong earthquake that is hard to stand up or lasts longer than a minute.

Don't wait for official warning, evacuate, and wait in a safe place for the official all clear – a wave could arrive within minutes.

# Appendix 11 - Rules Checklist

Proposal: Northland Tsunami Rollout

Address: Te Karuwha Road Roundabout Roadside Reserve, Paihia

District Plan: Far North District Plan

| Siren 67 | Te Karuwha Road Roundabout Roadside Reserve |
|---|---|
| Operative Zone | Commercial Activities Zone (Sub Zone – A2) |
| Proposed Zone | Mixed Use Zone |
| Operative Overlays/Controls | None |
| Proposed Overlays/Controls | Coastal Environment Overlay, Coastal Erosion (Zone 1:50 Year Scenario), Coastal Flood (Zone 1:50 Year Scenario), Coastal Flood (Zone 2: 100 Year Scenario), Coastal Flood (Zone 3: 100 Year + Rapid Sea Level Rise Scenario), River Flood Hazard Zone (10 Year ARI Event) and River Flood Hazard Zone (100 Year ARI Event). |
| Designations | NZTA3 (Waka Kotahi – New Zealand Transport Agency) |

| Rule | Compliance | Non-Compliance |
|---|---|---|
| **Commercial Activities Zone (Sub Zone – A2)** | | |
| 7.7.5.1.1 BUILDING HEIGHT<br>• (viii) Paihia Areas A2 - Maximum height 10m | **Complies**<br>Siren 67 will be 9.12m heigh so less than the max threshold | |
| 7.7.5.1.2 SUNLIGHT<br>No part of any building shall project beyond a 45-degree recession plane as measured inwards from any point 2m vertically above ground level on the nearest site boundary which adjoins a Residential, Coastal Residential, Russell Township, Rural Living or Coastal Living zones | **Complies**<br>Proposed Siren site does not exceed HIRB on a boundary adjoining the Residential, Coastal Residential, Russell Township, Rural Living or Coastal Living zones. | |
| 7.7.5.1.3 VISUAL AMENITY AND ENVIRONMENTAL PROTECTION | **N/A** site only adjoins Commercial Zone and no landscaping required. | |
| 7.7.5.1.4 SETBACK FROM BOUNDARIES<br><br>(b) The setbacks from the road boundary within the Commercial Zone in Paihia as shown on Map 91 shall be as follows: (ii) Area A2: 6m | **Complies**<br>a. N/A road frontage is not a 'pedestrian frontage'<br>b. Siren is setback more than 6m from any boundary<br>c. N/A Not within area A5 | |

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| Rule | Compliance | Non-Compliance |
|---|---|---|
| 7.7.5.1.5 NOISE MITIGATION FOR RESIDENTIAL ACTIVITIES | **N/A** not residential activity | |
| 7.7.5.1.6 TRANSPORTATION | **N/A** - Traffic, Parking and Access rules not relevant to the proposal. | |
| 7.7.5.1.7 KEEPING OF ANIMALS | **N/A -** no keeping of animals proposed | |
| 7.7.5.1.8 NOISE | | **Does not Comply**<br>Siren 67 will exceed the permitted noise thresholds.<br>**Restricted Discretionary Activity** |
| 7.7.5.1.10 ROOF PITCH | **N/A** not within Area A5 | |
| 7.7.5.1.11 STORMWATER | **N/A** | |
| .7.5.1.12 HELICOPTER LANDING AREA | **N/A -** no helicopter landing area proposed. | |
| **Natural and Physical Resources** | | |
| 12.7.6.1.1 SETBACK FROM LAKES, RIVERS AND THE COASTAL MARINE AREA<br>c. minimum of 20m in the Commercial and Industrial Zones | **Complies**<br>Siren 67 is more than 2m from the CMA | |
| 12.7.6.1.2 SETBACK FROM SMALLER LAKES, RIVERS AND WETLANDS | **N/A** | |
| **Proposed FNDC plan – rules that have immediate legal effect.** | | |
| **EW-R12** Earthworks and the Discovery of Suspected Sensitive Material | **Complies** | |
| **EW-R13** Earthworks and Erosion and Sediment Control | **Complies** | |
| **EW-S3** Accidental Discovery Protocol | **Complies** | |
| **EW-S5** Erosion and Sediment Control | **Complies** | |