

Multirole Acoustic Stabilized System for vehicular application

LW MASS CS-424 (V)400 family



LW MASS CS-424(V)400			
Doc.STC301			
Revision	Date	Author	Approval
01	23/11/2017	V.L.	F.S.

All rights reserved. Reproduction in whole or in part without written permission is prohibited. Design, features and specifications are subject to change without notice. November 2017

REVISION LIST

Revision	Date	Author	Description of change
00	05/12/2016	V.L.	First Draft
01	23/11/2017	V.L.	Technical Data Revised

FOREWORD

Sometimes there is true need for police and generally for people working in security to warn and effectively contrast possible threats without recurring to lethal weapon.

This is the case of police that need to warn protesting people to keep adequate distance or contrast them if they are coming too close by using only means able not to injury them.

It is also the case in which FOB or other sensitive site (like a prison or industrial plant) must protected against intruders.

In all these cases the use of LW MASS CS-424(V)400 can be the right solution.

This device, that can be used in fixed positions or installed on vehicles, allows to communicate long distance and contrast possible threats without rising sny dangerous means.

When installed on vehicles, thanks to its stabilization it can be used also during vehicle movement (low movement)

The **LW MASS CS-424(V) 400** is equipped with a green Laser Dazzler with associated Laser Range Finder and a powerful Search Light are used as additional deterrents against threats or as supporting tools during SAR missions.

The **LW CS-424(V)400** is also equipped with cameras, one low light Video Camera and one Thermal for night operations, to watch over and recording events in real time.

The two cameras are also used to automatically video track targets through a very effective Video Tracker Module the system is equipped with.

The system allows also to record audio messages sent to targets and images from the cameras, to be used as evidences during after-event analysis, legal procedures or as proof of the actions put in place.

PURPOSE

This document has the purpose to describe the Light Weight Multirole Acoustic Stabilized System MASS CS-424(V) in the version for vehicular applications and identified by:

LW MASS CS-424(V)400

in its full optional version

The proposed equipment is designed and qualified in accordance with the most severe military specifications.

COMPOSITION

The standard LW MASS CS-424(V)400 system is composed of:

- No. 1 LW Multirole Acoustic Stabilized System CS-424(V)400 including:
 - o No. 1 Stabilized Pedestal (0-359°/±30°)
 - o No. 1 Acoustic Emitter (Hailer) 14"
 - o No. 1 High Intensity Search Light
 - o No. 1 Laser Range Finder
 - o No. 1 Laser Dazzler
 - o No. 1 TV Color camera (low light)
 - o No. 1 Thermal Camera
- No. 1 Control Console with proper software modules for
 - o Functions management
 - o Video display
 - o Video Tracker
 - o Trouble shooting



In the following paragraphs a description of the system components is provided.

All rights reserved. Reproduction in whole or in part without written permission s prohibited.
Design, features and specifications are subject to change without notice. November 2017

DESCRIPTION

LW MASS CS-424(V)400

This system allows a long-range communication towards a target where human people can hear it.

In particular, it finds application in:

- **SAR missions** where it is important to be heard from people at a long distance;
- **Anti-Riot missions** to warn approaching people to keep distance and not to come close;
- **Self-defence** to deter an approaching vehicles or people by means of extremely high volume sounds or by a green laser light or a powerful white light.

A short description of the various components of the LW MASS CS-424(V)400 is given here below.

Stabilized Pedestal

The Pedestal is a 2-axes motorized platform with the function to keep the Acoustic Emitter and the other devices pointing the target. The pointing is achieved by means of a remote control driven manually by the operator or in automatic mode thanks to an effective video tracking module.

The pointing is very fast - maximum speed of rotation is 40°/s in both azimuth and elevation – and accurate.

The Pedestal is stabilized against motions being equipped with an internal IMU (Inertial Measurement Unit) allowing the stabilization.

Acoustic Emitter

The Acoustic Emitter has the following characteristics:

- Long distance and directive acoustic communication, with maximum range of 1.500 m for intelligible voice messages.
- Maximum acoustic output (Sound Pressure Level) of 151 dB_{SPL} at 1 m (SPL Peak Max)
- Maximum output directivity at 2 kHz of $\pm 12^\circ$ (24° conical) with more than 3dB reduction compared to the beam centre.
- Frequency response: 300 Hz to 8 kHz.

Search Light

It is a High Intensity Search Light Projector with the capability to illuminate a target up to a distance of 2.000 m.

The device is IP67 grade protected and grants the possibility to be adjusted both in terms of power and focus of the light beam.

Laser Dazzler

It is a very effective device to temporarily blind or disorient people on board a vehicle (target) with intense (5 W) and very focused radiation.

The Laser Dazzler can be used in continuous or "Strobe" mode emission (with frequency from 10 Hz to 20 Hz) to enhance the capability of the system to disorient and frighten the threat.

In terms of safety, when the distance of the target is below the NOHD (Nominal Ocular Hazardous Distance) the control electronics, automatically provides the shut down of the Laser Dazzler.

Laser Range Finder

It is a eye-safe type Laser, allowing the operator to measure the distance of the threat/target up

All rights reserved. Reproduction in whole or in part without written permission s prohibited.
Design, features and specifications are subject to change without notice. November 2017

The operator, through the Control Console HMI, can perform the following functions:

- Switch on and off the System
- Point the MASS device towards the target (by means of a joystick control).
- Activate the automatic pointing function (Video Tracker)
- Activate the microphone for directly speaking to the target
- See the distance of the target (Rang Finder)
- Activate the Laser Dazzler
- Transmit pre-recorded voice message or disturbing sound in MP3 format
- Adjust the acoustic volume
- Illuminate the target by means of the search light
- Control the power and the beam width of the search light
- Display the video camera (or the thermal camera)
- Record images from the video camera (or the thermal camera) [*]
- Adjust the video camera zoom
- Record messages (or sounds) sent to the target [*]
- Set the sectors in which the operation of the MASS (audio emission, light emission, laser emission) is inhibited to preserve the personnel safety
- To see detailed troubleshooting messages

[*] This feature allows to show evidences, in the post event analysis, of the engagement rules followed by the operator and the actions made by the target during the occurrence.

In terms of physical construction the Control Console can be supplied in either Ruggedized version or as a Commercial Laptop computer.

The two types of Control Consoles provide exactly the same functions, while differentiating in terms of design and the construction.



Rugged Control Console
C-424(V)4



Laptop computer
C-424(V)3

Control Console types

All rights reserved. Reproduction in whole or in part without written permission s prohibited.
Design, features and specifications are subject to change without notice. November 2017

In both cases the Control Console is equipped with proper keyboard and mouse (integrated), Joystick and Microphone.

LAN SERVER

A LAN server can enrich the system in case one or more of the units can be connected to a central control station (like prison or FOB protection application).

The LAN server then, if connected to the same LAN of the other components of the system, has the aim to allow the direct control of one (or more) LW MASS devices CS-424(V) from the CMS.

As an option, the LAN server can be equipped with a LCD screen, keyboard and joystick; in this case it can act as additional Control Station for one or both the MASS devices.

TECHNICAL DATA

LW MASS CS-424(V)400

Dimension and weight

Dimensions (mm)	970 (h) x 790 (w) x 690 (d)
Weight(Kg)	140 approx
Material	Aluminium

Power Supply

Voltage	115 - 230 Vac or +24/28 Vdc (with external inverter- option)
Consumption	400 W (average) 1 KW (maximum)

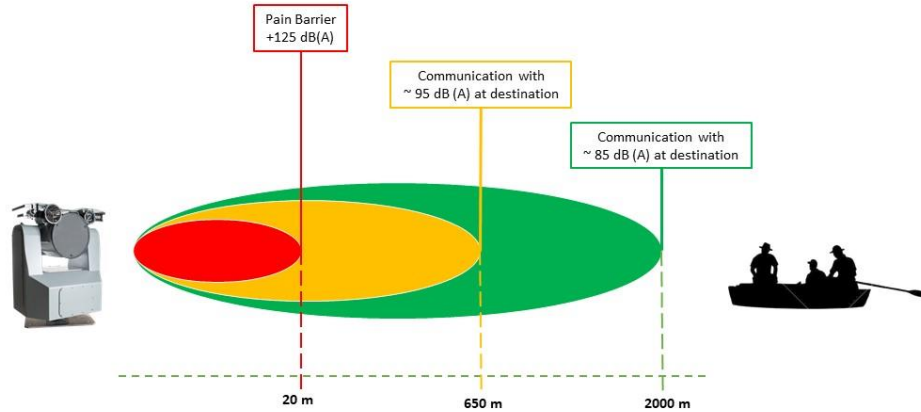
Motorized Pedestal

Azimuth	0-359 °
Elevation	+/- 30°
Pointing accuracy	+/- 0.5°
Rotation speed	40°/sec
Rotation Safety	Mechanical limits
Stabilization against	Roll, Pitch, Heading

Acoustic Emitter

Audio messages	Voice (live via microphone or pre-defined messages stored in the memory)
Audio emission	Sound ((pre-recorded uncomfortable sounds) 151 dBA at 1 m (LL Peak Max)
Beam-width:	+/- 12° (24° conical at 2 kHz/3dB)
Frequency response:	300 Hz to 8 kHz

LW MASS CS-424 RANGE



RED – Threshold of pain > 125 dB
AMBER – Secure communication CA 95 dB at this distance
GREEN – Maximum reach of communication approx 85 dB at this distance

**Note. Values are calculated from output measures in anechoic chamber*

Search light

Range	3.500 m
Protection Grade	IP 66
Adjustments	Power and Focus (1° to 40°)

Video Camera

Sensitivity	0.01 Lux
Optical zoom	30 X optical zoom
Resolution	Full HD
FOV(H)	from 63,7° to 2,3°

Thermal Camera (all weather)

Type	Un-cooled
Resolution	640 x 480 pixels
FPS	30
Focal Length	25° (H) x 20° (V)
FOV	100 mm lens: 6.2° (H) x 5° (V) 100 mm lens: 8.3° (H) x 6.2° (V) 100 mm lens: 10.4° (H) x 8.3° (V)

Laser Dazzler [**]

Laser power	5000 mW
Wavelength ()	532 μm
Beam output (module)	100 micron core fiber
Divergence	5 mrad (or 10 mrad on request)
Type of emission	Continuous or Strobe mode (10 Hz)

Laser Range Finder

Laser Range Finder (LRF)	Class I (eye safe), 905 nm
--------------------------	----------------------------

All rights reserved. Reproduction in whole or in part without written permission s prohibited.
 Design, features and specifications are subject to change without notice. November 2017

LRF covering range 1.500 meters (*referred to 10 m² NATO target, visibility higher than 20 Km*)

Environmental (certification pending)

Vibration	MIL-STD-167-1A
Shock	MIL-STD810G
Temp. (hot)	MIL-STD-810G Meth. 501.5 Proc. II (60°C)
Temp. (cold)	MIL-STD-810G Meth. 502.5 Proc. II (-33°C)
Rain	MIL-STD-810G Meth. 506.5, Proc. I, Blowing rain
Humidity	MIL-STD-810G Meth. 507.5, Proc. II, "aggravated cycle"
Salt fog	MIL-STD-810G Meth. 509.5
EMC	MIL-STD-461F Class IV

Control Console

Laptop computer C-424(V)3

Commercial grade computer with Windows 7 operating system

Rugged Control Console C-424(V)4

Operating System	Windows Embedded Industry Pro
Display	Touch Screen 13.3" TFT LCD FHD (1920 x 1080)
Memory	8 GB DDR3
	SATA SSD 128 GB shock resistant
Rugged Features	MIL-STD-810G
Operating Temperature	- 20°C to + 55° C
Storage Temperature	- 40° C to + 71°C
Humidity	0- 95% RH
Dimensions	570(W)x360(H)x360(D)
Weight	Approx. 6kg

SYSTEM INTERFACES

Ethernet 10/100 on copper
 With AHRS RS-422, NMEA 0187 protocol (Heading, Roll, Pitch)



Arsenale Marittimo Militare
Viale Amendola 1, Fabbricato 19
19121 La Spezia (Italia)
Tel. [+39] 0187 695911
Fax [+39] 0187 6959253
E-mail: sales@sitep.it
www.sitepitalia.it