LCS Hardware Manual

Release 001

Embention

2024-03-28

CONTENTS

LCS is a portable ground control station with Veronte Toolbox installed. It includes a sun-readable screen and meets the MIL-STD-810 standard, making it a useful tool to enhance Veronte Autopilots outdoor perfomance.

Warning: Select your version before reading any user manual. The following image shows where to select a version from any Embention user manual.

INTRODUCTION

Laptop Control Station (**LCS**) for UAVs and drones is a ready-to-use system designed for high-performance autonomous vehicle operations. Thanks to its built-in battery and robustness for outdoor use, LCS is positioned as a fully adaptable option for operators' most demanding needs. The Veronte Toolbox is pre-installed on the station to ensure the management of the Veronte Autopilot.

The control station has the following features:

- **Portability**: rugged laptop PC with built-in battery for extended operation time.

- **Embedded control station**: ready-to-use Veronte Toolbox pre-installed for operation and configuration.

- **Certification and durability**: fully rugged all-weather MIL-STD-810H & IP66 design built with magnesium alloy.

The LCS is equipped with the **Veronte Toolbox**, so the following applications are pre-installed:

- Veronte Link
- 1x PDI Builder
- Veronte Ops
- Veronte HIL
- 1x PDI Calibration
- Veronte Updater

1.1 Veronte Link

Veronte Link establishes communication between a computer and any Veronte product by creating a VCP bridge. It allows to use multiple control stations and autopilots to be interconnected, operating simultaneously.

Veronte Link also includes a post-flight viewer, to reproduce all recorded data from previous flights and generate plots and reports.

Veronte Link supports Windows operating system.

1.2 1x PDI Builder

1x PDI Builder is the main configuration tool to adapt a Veronte Autopilot 1x to a specific vehicle, including user-defined communication protocols. 1x PDI Builder includes:

- Telemetry: real-time onboard UAV metrics, such as sensors, actuators and control states.
- Configuration: edit vehicle settings, such as servo trim, interface/port management and modes.
- Automations: actions that are automatically executed when a set of configured conditions are accomplished.
- Block Programs: Veronte Autopilot 1x can be programmed (control laws) with a friendly-user programming language.

1.3 Veronte Ops

Veronte Ops is an application for the operation and monitoring of the vehicle during the mission.

Veronte Ops includes:

- Telecommand: Support for all synchronous operator control commands that can be sent to the flight segment, e.g. operational mode switch, mission management, payload control.
- Mission design: Configuration of user-defined, pre-defined mapping and launch missions, as well as in-flight mission editing.
- Operation parameters: Configuration of operation parameters, such as theirs values, positions and directions, which may vary depending on the mission and during the mission.

- Workspace: User can get feedback on autopilot variables and status through widgets.

- Multiple users: One or more operators can work simultaneously.

1.4 Veronte HIL

HIL Simulator is the Veronte application to perform HIL (Hardware In the Loop) simulations. This kind of simulation runs Veronte software with a real autopilot (1x or 4x), taking simulator input as real sensor data. The whole flight is controlled by the real autopilot in a virtual environment, making it the perfect tool for vehicle development and training operators in the use of Veronte autopilot, prior to conducting real flight operations.

HIL simulator is designed for applications such as:

- Pilot training.

- Veronte configuration for unmanned platform control.

- PID setting.

- Mission configuration.

- Aircraft performance validation.

The operator can fly the system as a real flight, being compatible with main Veronte features: real-time mission edit, in-flight automatic to manual control, and flight data recording.

1.5 1x PDI Calibration

1x PDI Calibration is the application tool that allows the user to perform certain calibrations of a Veronte Autopilot 1x and trim stick inputs. The calibrations that can be performed from this app are as follows:

- Sensors Calibration: IMUs and Magnetometers

- Calibration of Servos

1.6 Veronte Updater

Veronte Updater updates the software version of almost all Embention devices, being Veronte Autopilot 1x most of the time.

QUICK START

The LCS is ready to use since it consists of a portable station with a pre-installed software: the Veronte Autopilot Toolbox. The LCS allows to control and set the Veronte Autopilot even in adverse environments, reaching the site of each type of mission. The control station , indeed, aims to support the missions performed with the Veronte Autopilot thanks to its portability and endurance.

TECHNICAL

In this section the main features and specifications of the LCS are listed.

3.1 Main Features

Software	Veronte Autopilot Toolbox
OS	Windows 11 Pro | Linux-Optional
CPU	Intel Core i7-1185G7 vPro processor
Memory	RAM 16GB | SSD 512GB
Touch Display	Multi-touch | Outdoors use
Rugged	MIL-STD-810 | IP 66
Dimensions	31.5 x 36.5 x 5.5 cm | 3.35 Kg

3.2 Veronte Toolbox

Pre-Installed	Ready-to-fly system
Operation	Ops | Terrain
Configuration	PDI Builder | PDI Calibration
Management	Link
Third-Party	Optional installation

3.3 Hardware

Keyboard	UK Keyboard
Touchpad	Gen2 resistive touchpad with multi-touch
Display	14.0 inches | FHD 1920 x 1080 | Capacitive gloved touch
Screen	IPS with direct bonding | Anti-reflective (AR)
Graphics	Intel® Iris® Xe Graphics
Audio	Microphone | High Definition | 95db speakers
Interface	USB-C | USB-A x2 | Ethernet | MicroSDXC
Multimedia	HDMI 4K | Audio In/Out 3.5mm
Communications	Dual SIM
Webcam	5MP w/privacy cover & tetra-array mic

3.4 Certification and Security

Compliance	MIL-STD-810H | MIL-STD-461G | IEC 60529 (IP66)
Securuty	Intel Hardware Shield | Secured-core | TPM 2.0
Encryption	NIST BIOS | Encrypted SSD

3.5 Power

Battery	Li-Ion battery (18 hours) | 3h charging time
Hot Swap	Yes
AC Adapter	AC 100V-240V worldwide power

FOUR

ACRONYMS AND DEFINITIONS

HIL	Hardware In the Loop
LCS	Laptop Control Station
UAV	Unmanned Aerial Vehicle

CONTACT DATA

You can contact Embention if you need further help and support.

Embention contact data is as follows:

Email: support@embention.com

Telephone: (+34) 965 421 115

Address: Polígono Industrial Las Atalayas, C/ Chelín, Nº 16, CP 03114, Alicante (España).