Engineering Schematic

Distributed AGV Onboard Network & Telemetry Architecture

This document details the hardware configuration, wiring logic, and network topology for implementing a decoupled AGV communication system using Valtoris modular nodes. This architecture eliminates the single points of failure inherent in integrated "All-in-One" gateways and minimizes chassis wiring.

1. Node Deployment & Wiring Logic

Node A: The Connectivity Backbone (VT-LTE400)

Function: Handles WCS/AGVS uplink via 802.11r fast roaming with 4G LTE failover.

- **Placement:** Highest point of the AGV chassis (ensures optimal RF line-of-sight and avoids motor EMI).
- **Power Input:** 9-24V DC (Connects directly to AGV battery system; wide voltage tolerates motor startup drops).
- **Network Role:** Acts as the central switch and DHCP Server for all onboard edge nodes.

Node B: Serial-to-Ethernet Bridge (1CH-RS232/485/422-ETH)

Function: Converts ground-level Modbus RTU/ASCII signals (BMS, Servo Drives, RFID) to Modbus TCP.

- **Placement:** Bottom chassis, adjacent to motor drives. **Goal: Keep serial cables under 0.5 meters.**
- **Wiring (RS485):** Pin T/R+ to Drive A+, Pin T/R- to Drive B-. (Ensure common ground if drives lack optical isolation).
- **Uplink:** Standard Cat5e/Cat6 Ethernet cable to VT-LTE400 LAN Port 1.

Node C: Discrete I/O Edge Node (4CH-IO-ETH)

Function: Captures physical signals (bumpers, limits) and triggers outputs (alarms, relays).

- **Placement:** Chassis perimeter, near mechanical bumpers or photoelectric sensors.
- **Wiring (DI):** Supports dry/wet contacts. Connect Bumper switch to DI_1 and COM.
- **Wiring (DO):** Connect DO_1 to the 24V Warning Beacon relay.
- **Uplink:** Standard Cat5e/Cat6 Ethernet cable to VT-LTE400 LAN Port 2.

2. Recommended IP Address Assignment

Device Node	Interface	Recommended IP (Static)	Gateway
VT-LTE400 (Main Router)	LAN / WLAN	192.168.1.1	-
AGV IPC (Main Controller)	ETH0	192.168.1.2	192.168.1.1
1CH Serial Node	LAN	192.168.1.10	192.168.1.1
4CH I/O Node	LAN	192.168.1.11	192.168.1.1