VT-AGV-3588J AGV Controller

Product Brief

VT-AGV-3588J AGV controller is dedicated for the Automated Guided Vehicle (AGV) and Autonomous Mobile Robot (AMR) industries, boasting outstanding performance and powerful functions for the automation of vehicles, such as standard lift trucks and mobile robots. It comes with a 8GB memory and 64GB storage, with option for larger capacity configurations, easily handling complex computations and large-scale data storage requirements. Equipped with an STM32 series MCU, it provides a reliable control foundation for the entire system, enabling rapid and accurate data processing and instruction execution.

VT-AGV-3588J features three Gigabit Ethernet ports (M12 aviation plugs), dual-band (2.4GHz&5GHz) Wi-Fi, and Bluetooth 5.4, ensuring stable network communication to meet the rapid data transfer needs. The full-function USB Type-C interface supports OTG and DP output for convenient operation and monitoring. In addition, the controller offers rich interfaces for connection of various peripherals, including USB Type-A, CAN 2.0, DI, DO, AI, AO, isolated RS232, RS485, and SSI, ensuring efficient and stable operation of AGVs.

VT-AGV-3588J runs on Ubuntu 22.04 system, with flexible integration of Codesys Runtime and ROS 2 Humble, which enables customers to develop AGV/AMR control solutions for different application scenarios according to their specific needs, achieving more function expansions.

Exterior and Features

2 x Wi-Fi & BT antenna

Connector B   User button

USB-C

3 x ETH (M12)   7 x LED Indicator   Connector A

| VT-AGV-3588J |
| --- |
| Arm-based Octa-core processor |
| 6 TOPS NPU for AI acceleration |
| AI/AO/DI/DO for industrial data automation |
| Wi-Fi/BT/ETH for network connectivity |
| Low-latency, low-jitter motion control |
| 9V-36V wide input voltage range |
| IP65-rated for demanding environments |
| Ubuntu 22.04 + Codesys Runtime & ROS 2 Humble |

VT-AGV-3588J AGV Controller Datasheet

VT-AGV-3588J			
System	CPU	Quad-core ARM Cortex-A76 MPCore processor (Max. 2.0GHz) + Quad-core ARM Cortex-A55 MPCore processor (Max. 1.7GHz)	
	MCU	STM32F4 Series	
	GPU	ARM Mali-G610 MC4, OpenGL ES 1.1/2.0/3.2, OpenCL 2.2, and Vulkan1.2 supported	
	NPU	6 TOPS, INT4/INT8/INT16/FP16 supported	
	Memory	8GB LPDDR4 (Optional: 16GB)	
	Storage	64GB eMMC V5.1 (Optional: 128GB)	
		2Kb EEPROM (Only for hardware information storage)	
Communication	Ethernet	3 x M12, 1000Mbps	
	Wi-Fi & Bluetooth	Wi-Fi IEEE 802.11 a/b/g/n/ac + BT 5.4	
Media	Video processing	8K@60fps H.265 / 8K@30fps H.264 decoder, 8K@30fps H.265/H.264 encoder	
	Display	1 x DisplayPort 1.4a combo with USB 3.0 Type-C	
I/O	USB	2 x USB 2.0 Host	1 x USB 3.0 Type-C (OTG, DP)
	Serial port	2 x RS232, isolated (Max. 235kbps)	2 x RS485, isolated (Max.500kbps)
		2 x SSI, isolated (Max. 10mbps)	
	CAN	2 x CAN 2.0	
	Analog input	4 x AI, isolated (2 x 0-20mA, 2 x 0-24V)	
	Analog output	2 x AO, isolated (0-20mA)	
	Digital input	12 x DI, isolated (0-24V at 50mA)	
	Digital output	12 x DO, isolated (0-24V at 0.5A)	
	Relay	2 x All_Ok relay output	
	Antenna	2 x SMA male antenna connector for Wi-Fi and Bluetooth (distance: 3cm)	
Miscellaneous	RTC	Supported	
	Watchdog timer	Supported	
System Control	Button	1 x User button (user definable)	
	LED indicator	1 x Power indicator	3 x ETH connectivity indicator
		1 x Error indicator for Codesys	1 x Wi-Fi connectivity indicator
		1 x Codesys running status indicator (Green: Normal operation; Red: Stopped)	
Power	Input	9V-36V DC (over-voltage / power failure protection, reverse polarity protection)	
	Consumption	~6W (Power on without applications running)	
Software	OS	Ubuntu 22.04 + Codesys Runtime & ROS 2 Humble	
	Protocol	CANOpen, EtherCAT	
Mechanical	Dimensions	239.9mm x 124.9mm x 54.5mm	
	Weight	960g	
	Installation	4 x M5-16mm screw recommended	
	IP rating	IP65	
Environmental condition	Temperature	Operating: -20℃~70℃	Storage: -40℃ ~ +80℃
	Humidity	5%~95% RH (non-condensing)	

Connector Pinout

Connector A Profile
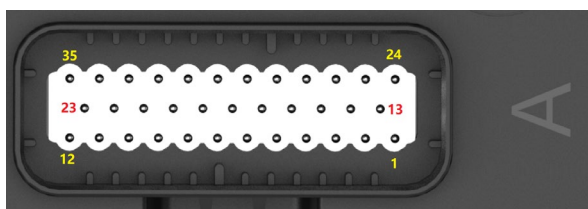
Pinout

Pin	Signal	Description
Pin 1	P_GND	Power ground
Pin 2	RS232_RX0	RS232 receive (Channel 0)
Pin 3	RS232_RX1	RS232 receive (Channel 1)
Pin 4	RS232_TX1	RS232 transmit (Channel 1)
Pin 5	RS485_A0	RS485 A signal (Channel 0)
Pin 6	RS485_B0	RS485 B signal (Channel 0)
Pin 7	RS485_B1	RS485_1 B signal
Pin 8	RS485_A1	RS485_1 A signal
Pin 9	DAC_GND	DAC analog output ground
Pin 10	AO_OUT2	DAC analog output (Channel 2, 0–20mA)
Pin 11	AO_OUT1	DAC analog output (Channel 1, 0–20mA)
Pin 12	ALL OK_CO	Self-test OK output (short connect CO & NO)
Pin 13	GND_ISO_232	RS232 signal ground
Pin 14	RS232_TX0	RS232 transmit (Channel 0)
Pin 15	CAN0_L	CAN0 differential signal L
Pin 16	CAN0_H	CAN0 differential signal H

Pin	Signal	Description
Pin 17	GND_ISO_485	RS485 signal ground
Pin 18	USB20_CONN_2_DP	USB2.0-2 DP
Pin 19	USB20_CONN_2_DM	USB2.0-2 DM
Pin 20	GND	Digital ground
Pin 21	AI_V1	ADC analog input (0–24V, Channel 1)
Pin 22	AI_A0	ADC analog input (0-20mA, Channel 0)
Pin 23	AGND	ADC analog ground
Pin 24	B+	Power input (+)
Pin 25	CAN1_H	CAN1 differential signal H
Pin 26	CAN1_L	CAN1 differential signal L
Pin 27	CAN_GND	CAN signal ground
Pin 28	GND	Digital ground
Pin 29	USB20_CONN_1_DP	USB2.0-1 DP
Pin 30	USB20_CONN_1_DM	USB2.0-1 DM
Pin 31	VBUS 5V0_USB20	USB2.0 5V VBUS
Pin 32	VBUS 5V0_USB20	USB2.0 5V VBUS
Pin 33	AI_V0	ADC analog input (0–24V, Channel 0)
Pin 34	AI_A1	ADC analog input (0-20mA, Channel 1)
Pin 35	ALL OK_NO	Self-test OK output (short connect CO & NO)

Connector B Profile
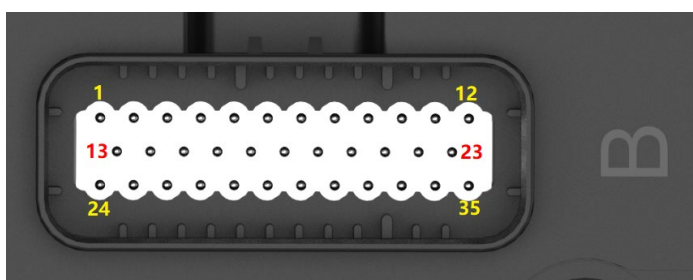
## Pinout

Pin	Signal	Description
Pin 1	D_IN10	Digital input (Channel 10)
Pin 2	D_IN11	Digital input (Channel 11)
Pin 3	D_IN8	Digital input (Channel 8)
Pin 4	D_IN7	Digital input (Channel 7)

Pin	Signal	Description
Pin 5	D_IN12	Digital input (Channel 12)
Pin 6	DGND	Digital input ground
Pin 7	D_OUT1	Digital output (Channel 1)
Pin 8	D_OUT2	Digital output (Channel 2)
Pin 9	D_OUT3	Digital output (Channel 3)
Pin 10	D_OUT4	Digital output (Channel 4)
Pin 11	D_OUT5	Digital output (Channel 5)
Pin 12	D_OUT6	Digital output (Channel 6)
Pin 13	D_IN9	Digital input (Channel 9)
Pin 14	D_IN6	Digital input (Channel 6)
Pin 15	D_IN5	Digital input (Channel 5)
Pin 16	ISO_GND	SSI signal ground
Pin 17	CLK1+	SSI_1 differential clock +
Pin 18	CLK1-	SSI_1 differential clock -
Pin 19	D_OUT7	Digital output (Channel 7)
Pin 20	D_OUT9	Digital output (Channel 9)
Pin 21	EX_GND	Digital output ground
Pin 22	D_OUT8	Digital output (Channel 8)
Pin 23	D_OUT10	Digital output (Channel 10)
Pin 24	D_IN1	Digital input (Channel 1)
Pin 25	D_IN2	Digital input (Channel 2)
Pin 26	D_IN3	Digital input (Channel 3)
Pin 27	D_IN4	Digital input (Channel 4)
Pin 28	DATA0+	SSSI_0 differential data+
Pin 29	DATA0-	SSI_0 differential data-
Pin 30	CLK0-	SSI_0 differential clock -
Pin 31	CLK0+	SSI_0 differential clock +
Pin 32	DATA1-	SSI_1 differential data -
Pin 33	DATA1+	SSI_1 differential data +
Pin 34	D_OUT11	Digital output (Channel 11)
Pin 35	D_OUT12	Digital output (Channel 12)

Product Outlines
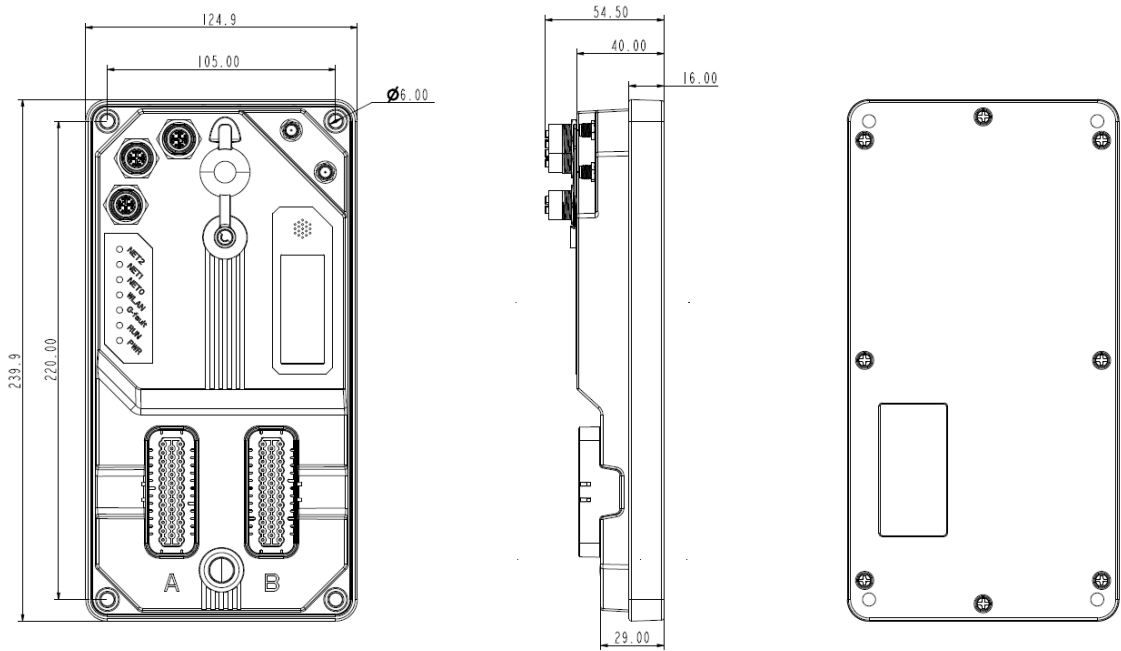
Ordering Information

Nomenclature

VT-AGV-RK3588J-[MS]-[IS]

MS (Memory & Storage): L-8GB+64GB; H-16GB+128G

IS (Integrated System): CS-Codesys Runtime; RS-ROS 2 Humble

Ordering No.	Memory & Storage	Operating System	Protocol
VT-AGV-RK3588J-L-CS	8GB + 64GB	Codesys Runtime	CANOpen, EtherCAT
VT-AGV-RK3588J-L-RS	8GB + 64GB	ROS 2 Humble	CANOpen, EtherCAT
VT-AGV-RK3588J-H-CS	16GB + 128G	Codesys Runtime	CANOpen, EtherCAT
VT-AGV-RK3588J-H-RS	16GB + 128G	ROS 2 Humble	CANOpen, EtherCAT

Packing List	
VT- AGV-3588J AGV Controller	1
Wi-Fi & Bluetooth antenna	2