AGM800

8-axis Central-i Master Controller

Datasheet

Rev.1.1

Product Description

The AGM800 is a high performance 8-axis Central-i master motion controller. It has 12 Central-i ports, eight of which can be connected to any remote Central-i amplifier, while another four can be connected to a remote device, such as an I/O module or a link adapter.

The AGM800 executes motion profiles and all servo control loops at a 16 kHz sampling rate, thus enabling multi-axis synchronization within nanoseconds.

The AGM800 is equipped with large amounts of flash and RAM memories to support complex applications and features, such as CNC motion and 3D error mapping.

AGM800 is ideally suited to control direct drive and servo motors, providing highly coordinated multi-axis motion with excellent position/velocity tracking, and settling performance. The AGM800 controller supports many advanced features such as active yaw gantry control, force control, CNC modes, user programs, and 2D/3D error compensation as standard features, and has user friendly configuration tools for easy implementation.

Part Numbering

Product Description	Part Number Format
8-Axis Central-i Master Controller	AGM800-CI[-CCC]

CI: Central-i communication
CCC: Optional customization number
Example: AGM800-CI

Central-i Overview

To support industrial machinery performance demands, Agito developed a distributed control fieldbus for motion control systems. The core of a Central-i system is a multi-axis master controller, which performs all control algorithms, including trajectory planning, position, velocity, and current loops.

The remote units do not require any computational resources or configuration memory, and receive algorithm results via the simple and efficient Central-i digital protocol. The system's star communication topology enables synchronization of all remote devices and their power PWM signals within nanoseconds.

A Central-i system is easily setup by simply plugging in the cables. The system adapts itself to the connected remote devices, without needing to learn complex networking protocols or object items.

Although the hardware is distributed, it operates as a centralized system, in which the master controller has access to all signals at the remote devices in every sampling cycle. The system designer designs the system as a distributed system, with various locations and types of remote units. The system integrator configures, tunes and programs the system with all configuration, data and calculations stored and executed within a single, master controller.

The Central-i network contains all the necessary functionalities for semiconductors, electronic assembly, 3D printing, flat panel display (FPD), and other high performance applications.

Technical Specifications

Feature	Specification
Number of Central-i ports	12
Number of axes	8
Power	Nominal supply voltage: 9–36 VDC Power consumption: 6 W
CPU	ARM Cortex A9, 900 MHz dual core
Flash memory	128 MB (and external SD card)
RAM	8 GB
Communication	Ethernet, RS232
Fieldbus to amplifiers, I/Os	Central-i
Key Features	▪ Encoder error mapping: 1D, 2D or 3D ▪ Auto-loop shaping (auto-tuning) ▪ Frequency domain system identification and modeling ▪ Flexible gain scheduling based on motion conditions ▪ Position lock and event ▪ Advanced Auto-tuning algorithm in frequency domain ▪ Force control and mode switching ▪ Ultra Precision mode (UPM) ▪ Input-shaping ▪ Profile-shaping ▪ Machine vibration control with external sensor ▪ Spring and friction compensation ▪ Active-yaw gantry control
Control sampling rate	16 kHz (position, velocity, optional force, current)
Motion modes	Point-to-point, Repetitive, Jog, ECAM, Gearing, Joystick, Handwheel, Pulse and direction, Gantry, Vector, Tracking, CNC sequential contour (G-codes)
Operational modes	Position, Velocity, Force, Current (torque) modes
Motion modes switching	Motion parameters, such as speed, acceleration, deceleration, and target position can be all modified on-the-fly
Interface to camera/laser	Via fast differential or optically isolated I/Os in remote AGIO or AGA10x: Event – position output event (1D or 2D), Lock – position capture. User programmable PWM output via remote unit with 1 MHz frequency.
CNC mode	CNC sequential contour (G-codes) support, FIFO buffering, Corners compensation, Linear, Circular and Helical interpolations.

Feature	Specification
Homing modes	User programmable: on encoder index, home switch, limit switch, hard stop. Easily configurable to any sequence.
Commutation	Motor learning, Auto-phasing (for incremental encoders), Hall sensors, Absolute encoder.
Programming interfaces	Standalone multi-tasking user programs – high level script-based program executed in the controller (up to 8 multi-threading programs with priority setting for each thread. More than 300 commands per 1 ms. IDE integrated in Agito PCSuite.
IDE and Host Interfaces	Agito PCSuite IDE and configuration software Windows .NET API available in NuGet package manager Linux .NET API The API can also be used in MATLAB, LabVIEW, and other environments compatible with Windows .NET Standard TCP/IP communication ASCII string commands or binary CAN format

Central-i Specifications

Feature	Specification
Topology	Star (peer to peer)
Cycle time	61 µs
Connector type	RJ-45 (Cat5e cable)
Cable length	Up to 20 m. Cables up to 100 m are possible with special hardware.
Physical layer	Dual channel RS485 full duplex
Baud rate	20 Mbps (per channel)
Synchronization of nodes	8 nanosecond
Supported Central-i devices	AGA101, AGA102, AGA103, AGA110 AGA155 AGL101, ACL102 AGIO01, AGIO02

Environmental Specifications

Feature	Specification
Operating temperature	0°C to 45°C
Storage temperature	-20°C to 70°C
Operating humidity	< 90%
Storage humidity	< 40%
Pollution degree	2
Vibration	1G @ 150 Hz according to IEC 60068-2-6
Operating conditions	Protection class: IP20

Dimensions and Weight

Feature	Specification
Unit dimensions (max)	H=141 mm, W=41 mm, D=107 mm
Package dimensions	155 mm x 55 mm x 120 mm
Unit weight	0.4 kg
Shipping weight	0.5 kg