

# MD100m



Securely Optimising Network Utilities:  
CGI's approach to delivering industrial control solutions to our critical infrastructure clients has been one of collaborative and secure product evolution.

CGI provides resilient building blocks that allow our clients to customise the physical architecture of a distributed control system, with flexibility for innovative modelling, control and data capture.

Our unique approach is made possible through our focus on local service excellence in design, manufacture, project delivery and support. This has resulted in the retention of key clients for over 20 years. These strong partnerships foster product currency, evolution and the innovation necessary to meet current and future business requirements as industries evolve to incorporate increasingly intelligent, automated and data-centric solutions.

## Applications

The MD100m range provides a flexible, scalable and economical solution capable of servicing many applications and market segments. The flexible architecture provides the potential to adopt a standard product to significantly reduce complexity and lifecycle costs resulting in an intuitive solution that is easier to engineer, operate and maintain.

Use cases may include but are not limited to, the following:

- Energy
  - Substation Automation
  - Transmission and Distribution networks
  - Solar and Wind Farms
  - IEEE2030.5 (DOE communications) coming soon
- Water and Wastewater
  - Storage and Distribution
  - Pump Stations
  - Treatment Plants
- Secure Communications
  - Gateway or Protocol converter: IEC61850, IEC60870, DNP3, Modbus, MQTT + Sparkplug B (IIoT), and more
  - Remote access - 4G/3G and LPWAN
  - Oil, Gas and Mining
  - Road and Traffic signalling



## Key features

- Modular and scalable, click-together
- High-performance and power-efficient
- Small footprint of W 25mm x H 115mm x D 135mm (per module)
- Cybersecurity: hardened OS, firewall, authentication, cryptography, encryption, aligning with IEC-62443
- Application / solution flexibility IEC61131-3 languages, distributed database, real-time SCL
- WebHMI (HTTPS)
- Open-source operating system provides abundant customisation capabilities
- Industry standard protocols
- Operating temp -20°C to 75°C
- Power range 24 – 125 V DC
- Conformal Coating (optional)
- Mounting: DIN rail NS 35/7.5
- Wiring: 5mm-pitch, up to 2.5mm<sup>2</sup>

## Regulatory compliance

- Safety: IEC 61010-1, IEC 61010-2-201
- EMI: CISPR 32/EN55032 Class A
- EMC: IEC 61000.6.5 Interface type 4
- Power station, Substation environments: IEC 61000-4-2/4-3/4-4/4-5/4-6/4-8 IEC 61000-4-16/4-17/4-18/4-29



Logic for individual use cases can be either custom developed, or ported from existing client solutions, thereby maintaining inherent Intellectual Property.

## Physical platform

Assembly is easy, simply snap the DIN rail bus connectors together to form the backplane, then plug in the required modules. This concept also allows for individual module removal.

## Minimal configuration

The base arrangement is a Processor and a Power Supply module, giving a footprint of just 50mm (W) on the DIN rail (2 modules).

## Maximum configuration

The maximum configuration is the above plus ten modules with the maximum number of analogue based modules not exceeding three due to power limitations.

## Field wiring

To ease installation and maintenance effort, all terminal blocks are plug compatible so that field wiring can be completed in advance, enabling the replacement of modules without disruption to field wiring.

## Communications architecture

The MD100m supports two Ethernet and three Serial ports that can be used to meet any number of different communications architectures.

Additional flexibility is provided by SFP based Ethernet allowing a choice of different physical transceivers (TX, T, FX or SX).

## Control languages

Two options are supported, either an IEC 61131 control language, or real-time Sequential Control Logic.

**PLCopen editors (IEC 61131)** - A software environment that enables users to create local or distributed control systems. It offers a combination of a highly portable, robust control engine (embedded within the RTU) and an intuitive application development environment (Workbench) supporting all IEC61131 control languages.

**Sequential Control Logic (SCL)** - For applications requiring true change of state processing, CGI's real-time distributed database and Sequential Logic Control solution is recommended. At the heart of this system is the object-based model of plant where updates are performed following a change of state, rather than via cyclical logic such as IEC61131-3. The change of state processing can then trigger control logic to start or ripple changes to higher level objects. Our approach simplifies control logic via pre-processed object data and avoids the performance-impacting recalculation of equipment states on each logic cycle.

## Modules

Available MD100m modules include:

### Power Supply

- 24 to 125 V DC range
- 20 Watt

### Processor

- ARM Cortex A5
- 2 x SFP Ethernet ports
- 3 x Serial (1 x RS485, 2 x RS232)
- Console and USB port
- 4 x Digital Inputs
- Micro SD card (optional)

### 4G Modem

- Serial RS232 (RJ45) input
- CAT M1 or CAT 1

### Digital Input

- 16 Channel
- Range 0 – 125 V DC
- Max current <2mA
- Input threshold 36 V (default)

### Digital Output

- 16 Channel (solid-state)
- Rated voltages up to 125 V DC
- Rated current 300mA continuous

### Mixed Digital Input / Output

- 8 Input Channels (as above)
- 8 Output Channels (as above)

### Analogue Input

- 8 Channel
- $\pm 10V$ , 0-10V,  $\pm 5V$ , 0-5V
- 0-20mA, 4-20mA, 0-10mA,  $\pm 10mA$
- RTD 100 $\Omega$ , 1000 $\Omega$ , 2, 3 or 4-wire
- Thermocouples J, K, T and S type

### Analogue Output

- 8 Channel
- $\pm 10V$ , 0-10V,  $\pm 5V$ , 0-5V
- 0-20mA, 4-20mA, 0-10mA

### Mixed Analogue Input / Output

- 5 Input Channels (as above)
- 3 Output Channels (as above)

*CGI works collaboratively with our clients and is committed to the continuous improvement of the design and performance of CGI's products. While every effort is made to ensure the information provided in this brochure is accurate, specifications are subject to change without notice.*

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