the iReact solution

iReact-MGC

Automate and optimize Microgrid/Smart-grid operation

The iReact-MGC is designed for the integration of power generation systems into isolated or grid-connected Microgrids. It is designed to manage and automate different types of power generation sources, such as wind farms, PV plants, diesel generators, hydro generators, etc., as well as energy storage devices, like flywheels and batteries. It delivers optimized operation of all grid integrated resources, by means of balancing between cost and energy efficiency, and achieving a smooth cooperation for a powerful electrical grid. In a typical Microgrid application, several iReact-MGC units are deployed, following a distributed architecture. All associated iReact-MGC units operate in a continuous and tight communication loop, in order to decide the optimal operation point of each interconnected power generation/storage node, always according to certain prioritization and rules provided by the Microgrid's designers. Failure of one or more nodes is not catastrophic for the overall operation of the Microgrid, as the distributed and multi-agent architecture provides fault-tolerant operation.

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SMART GRIDS
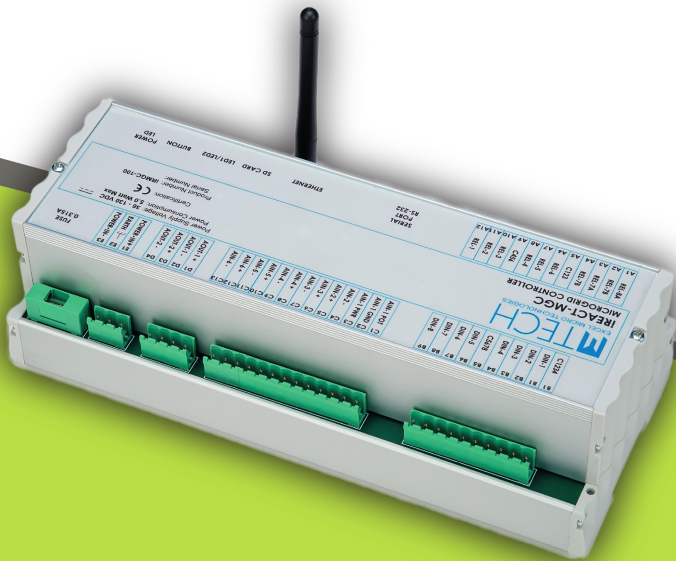
Major Features

Ready to work off the shelf and out of the box

Easy adaptation

Scalable: several devices may cooperate to build one system
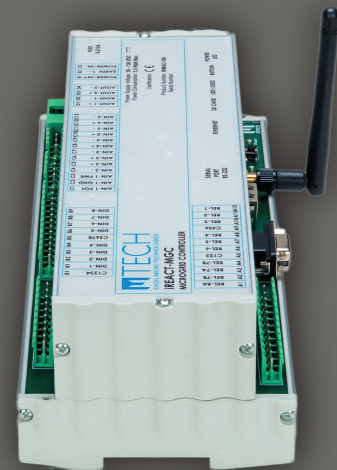
Controls any generation source

Benefits

Produce power with lower cost

Maximize utilization of Renewable Power Sources

Optimal Generation and Storage Scheduling

Increase Penetration of Renewable Generation

Optimize your microgrid's efficiency & produce power with lower cost and better quality

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The combination of the iReact-MGC with the iReact-Prognosis SaaS, may maximize efficiency, performance and quality of operations. Several Microgrids' simulation instances predict power load and examine several what-if and contingency scenarios (such as loss/trip of a power generation plant, abrupt change of feeders' conditions, etc.). Integration of historical data with current measurements, incrementally improves the operation mode executed internally in the iReact-MGC devices and delivers optimum performance. Integration of real-time weather information and short-term weather forecasts, provide additional critical information feed, minimizing unpredicted behaviour of the Microgrid.

Specifications*

Analog Output

Number	2 (independent)
Current Output Signal Range	4-20mA
Max Current Output	24mA
Non Load Voltage	25V
Output Power	1Watt
DA Conversion Frequency	10 samples/sec
Accuracy	8-bit
Error	0.1 % Full Scale
Linearity	< 0.01 % Full Scale
Ripple	< 20mV (at 250Ω)
Isolation	Optical Isolation
Configurable	Yes

Analog Input 1

Input Signal Range	Potentiometer (100Ω...100kΩ)
Sampling Frequency	max 100 sample/sec
Accuracy	10-bit (16-bit software processing)
Error	0.1 % Full Scale
Linearity	< 0.01 % Full Scale
Isolation	Optical Isolation
Configurable	Yes

Analog Input 2

Number	5
Input Signal Range	4-20mA
Load Impedance	135Ω at 10mA, 270Ω at 20mA
Sampling Frequency	max 100 sample/sec
Accuracy	10-bit (16-bit digital processing)
Error	0.1 % Full Scale
Linearity	< 0.01 % Full Scale
Gain temperature coefficient	-65ppm/°C
Isolation	Optical Isolation, safety approval: UL 1577 recognized (5kVrms/1min) CSA approved, IEC/EN/DIN EN 60747-5-2

Digital Inputs

Number	8
Range	23VDC – 140VDC
Dielectric Insulation	2.5kV peak at 50Hz
Isolation	Optical Isolation

Control Outputs 1

Number	6
Type	Relay Contacts
Contact Rating	30VDC, 250VAC, 3A
Cycles	100 000
Insulation Coil-Contact	4000Vrms
Insulation Open Contact Cir	750Vrms
Approval	EN61810-1
Insulation	IEC 60664-1

Control Outputs 2

Number	2
Type	Relay Contacts
Contact Rating	250VAC, 8A
Cycles	100 000
Insulation Coil-Contact	5000Vrms
Insulation Open Contact Cir	1000Vrms
Approval	EN61810-1
Insulation	IEC 60664-1

Real-Time Clock

Time	Hours, Minutes, Sec
Date	Day, Month, Year, Day Name
Battery Retention	10 years

Memory

Type	SD card
Write Cycles	> 100 000
Data Retention	approx. 5 years

Communication Interfaces

RS-232	Serial port
Ethernet	Local Area Network interface RJ45 ARP, UDP/IP, TCP/IP, Telnet, ICMP, SNMP, DHCP, BOOTP, TFTP, Auto IP, HTTP, 10/100Mbit auto sensing encryption
Protocol	Modbus Serial/TCP FIWARE
Wireless	Wi-Fi (optional)

Power Supply

Input Voltage Range	36VDC – 120VDC or 9VDC-40VDC (optional)
I/O isolation voltage	4000VACrms
Leakage current	2µA (at 240VAC, 60 Hz)
Isolation capacity	7pF typ. (at 100kHz, 1V)
Isolation resistance	>1000MOhm (at 500VDC)
External Fuse	0.3125 A Slow Blow Type

Operating Conditions

Temperature	-20°C to 70°C
Relative Humidity	5 to 90%, non-condensing

Housing

Mounting	DIN Rail
Material	Polystyrene
Color	Light Grey
Protection	IP 50
Connections	Removable Screw Type Terminals
Dimensions	250 x 105 x 75 mm
Weight	<1.0Kgr

Approvals

Safety	EN 61010-1
EMC	EN 61326
Impulse Voltage	IEC 60255-5 (5kV crest, 1.2/50µs, 0.5J)
High Frequency	IEC 60255-22-1 (2.5kV, 1MHz)
EFT	EN 61000-4-4, IEC 60255-22-4 (2kV, 5/50ns, 5KHz)
Power Frequency Voltage	2kVrms, 50Hz
ESD	8kV contact discharge, 15kV air Discharge
Mechanical Vibration	IEC 60255-21-1,60068-2-6

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