

MC-EDGE

YOUR GATEWAY TO MISSION-CRITICAL IoT

Now more than ever, IoT devices operating in mission-critical environments require a new level of connectivity and security. Whether it's a natural disaster or a man-made emergency, IoT devices are often on the first line of defense. When failure isn't an option, turn to MC-Edge.



This intelligent gateway protects your sensitive data from cyberattacks with end-to-end encryption. Full authentication, bulletproof access control and digital signatures keep your information safe. And, with the ability to transmit information over radio, LTE and IP networks, it's easy to migrate to an IoT network. Just choose the infrastructure architecture that works best for you. MC-Edge has you covered today, and prepared for tomorrow.

As the hub for seamless IoT connections, MC-Edge is P25, LTE* and LoRa* ready, capable of handling inputs from hundreds of low-power wireless sensors up to 10 km. And with extensive security and ultra-reliable communication capabilities, MC-Edge makes it easy to implement, support and grow your IoT systems to fully support all your mission-critical operations.

*LTE and LoRa hardware ready options available (future software support required)

MC-Edge. Smarter, more secure IoT for an unstable world.



EXTEND PROTECTION TO THE EDGE



ROLE-BASED ACCESS CONTROL

Assign specific roles and permissions to perform certain operations based on those roles. i.e. security admin could define roles and assign permission to each user.



ENCRYPTION

Data-at-Rest (DAR) protection ensures all sensitive data stored on devices or applications is encrypted with FIPS 140-2 validated AES 256 bit encryption significantly reducing the threat of lifting confidential data from compromised devices. Secure data in transit with end to end encryption with AES 256 bit encryption.



FIREWALL

Permit or deny data transmission into your system or device based on rules and established criteria. All IP messages must pass through a firewall which examines each one and blocks those not meeting security criteria.



AUDITING

Monitor suspicious activity such as deviations from the set security policy. Any attempt of unauthorized access to a secured MC-EDGE will be blocked and logged. The security log is encrypted and saved in FLASH memory to prevent malicious alteration and can be retrieved for forensic purposes after the event.



TIME-WINDOW COMMANDS

Add additional layers of defense to limit the risk of replay attacks such as a disgruntled employee with legitimate access. Timestamps are added to the command messages. The subsequent "action" must be received within a designated time and contain elements that match otherwise the action will be rejected.



INTRUSION DETECTION SYSTEM

Automatically look for malicious activity or violations of security policies. The MC-EDGE will only allow legitimate traffic to enter and block malicious activity. Unauthorized activity is logged and can be reported to a designated control center.



UNUSED PORT DEACTIVATION

The MC-EDGE enables unused ports to be disabled, reducing its vulnerability to unauthorized access.



ACCESS CONTROL

Verify access to an MC-EDGE is legitimate from both other edge devices or system users with authentication.

Land Mobile Radio
ASTRO P25 (APX 4000 inside)¹

Wireless Sensors Network
8 Channels LoRaWAN²

LTE²

Audio Out Interface
P25 Audio Out
(public announcements)

1. Based on the APX 4000 platform.
2. LTE and LoRa hardware ready options available (future software support required).
3. Future hardware support required.



Cryptographic Engine
MSI Micro SD Cryptr Module³

Ext. Communication Interfaces
(Eth, RS232/RS485)
Leased Line

Discrete Inputs/Outputs
Base: 3 DI's & 1 DO

Expansions:
Input: 12 DI, 8 AI
Output: 8 DO, 2 AO
Mixed: 7 DI, 6 DO, 4 AI, 1 AO



Input Module



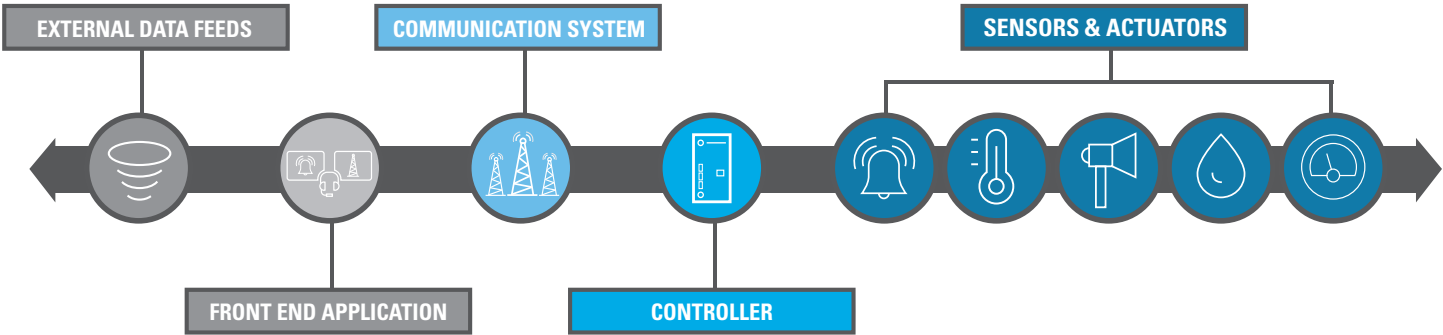
Output Module



Mixed I/O Module



IoT NETWORK



CPU		
Processor	Sitara CPU (Cortex-A8)	
Clock	600 MHz	
OS	Linux	
Memory	FLASH - System	256MB
	RAM	256MB LPDDR1
RTC	Hardware clock with year, month, date, day, hour, minute, and second supported	Yes
Communication Ports	RS232/RS485	Up to 1 port on main board (<115.2Kbps / <460.8Kbps) Non-Isolated
	Ethernet	Up to 1 port, 10/100 Mbps (auto negotiation)
	USB	Host
	Micro-USB	OTG

GENERAL		
Environmental with internal radio	-30 °C to +60 °C (-4 °F to 122 °F)	
Environmental without internal radio	-40 °C to +70 °C (-40 °F to 158 °F)	
RTC Battery Charging	-20 °C to +50 °C (-4 °F to 122 °F)	
Dimensions (CPU/IO Modules)	2.95" x 6.3" x 4.4" (WxHxD) (main/each expansion)	
DIN rail option	Yes	
Wall mount option	Yes (using DIN rail)	
Construction	Modular	
Input power	9-30V DC	
RTC backup Battery	Type	Coin Re-chargeable battery for 30 days
SDIO card	Yes	

INFRASTRUCTURE		
ASTRO	700/800 Tx Bands: 763-776,793-806 MHz/806-825,851-870 MHz Rx Bands: 763-776 MHz /851-870 MHz Channel Spacing: 25/12.5 KHz RF OutPut Power: 1-3 W Rx Sensitivity (12dB SINAD):0.250uV	
	VHF Tx /Rx Bands: 136-174Mhz Channel Spacing: 30/25/12.5 KHz RF OutPut Power: 1-5 W Rx Sensitivity (12dB SINAD):0.216uV	
	UHF R1,R2 Tx Bands: 380-470,480-520 Mhz Rx Bands: 340-470,450-520 MHz Channel Spacing: 25/12.5 KHz RF OutPut Power: 1-5 W Rx Sensitivity (12dB SINAD):0.234uV	
	900 MHz Rx/Tx Bands: 896-902,935-941MHz C.Spacing: 12.5 KHz RF OutPut Power: 1-2.5 W Rx Sensitivity (12dB SINAD):0.236uV	
	Null Modem	External
	LTE (hardware ready)	Internal
	LoRa Gateway Radio Chipset: SX1301 & SX1257 Freq Range: 902 to 928 MH RX Sensitivity: Up to -140dBm Max RF Output: +27dBm	
	Wireless Sensor Network - LoRa (hardware ready)	

SOFTWARE		
Configuration and maintained tool	PC Tool (STS)	
MDLC Networking	Yes	
Direct Link	Yes	
RTU to RTU communication	Yes	
MDLC Store and Forward	Yes	
Broadcast	Yes	
Diagnostic (local, remote)	Yes	
Error Logger (local, remote)	Yes	
User programming	1. C 2. IEC61131-3	
Security	1. AES256 End to End Encryption (FIPS 140-2 Level 2 as a future option) 2. User and Machine Authentication 3. Central Key Management 4. Central Authentication server 5. Access control 6. Sensitive data in rest encryption	
Protocols	Modbus RTU Modbus TCP/IP DNP3.0 Serial DNP3.0 IP MDLC SSH SFTP	
Time Synchronization	MDLC, NTP, GLONASS/GPS + 1PPS	
Set Date and Time	Yes (w/ Time Zone and Daylight-Saving)	
Services	DNS	Yes
	DHCP	Yes

I/Os		
I/Os ¹	Main Board 3DI + 1DO (Isolated) Input Module 12DI (Isolated) 8AI (Isolated) (AI: 0 -20mA, 4 -20mA, 0-5V) Output Module 8DO (ML & EE) 2AO (Isolated) (AO: 0 -20mA, 4 -20mA, 0-10V) Mixed I/O Module 7 DI/6 DO (Isolated) 4AI (0-20mA, 4-20mA) 1AO (0-20mA, 4-20mA)	
	For more details, please check the user guide.	
	DI Fast counter	2khz for all inputs
	I/O Performances	AO Resolution 12bit, 0.25% @25C
		AI Resolution 16 bit, 0.1% @25C

1. I/O expansion types are limited to 2 per MC-EDGE CPU.



INDICATIONS

	Yes
LEDS	Ports (RS232/RS485, Ethernet) Main I/Os Expansion I/Os Modules

CERTIFICATIONS

Safety	UL 60950-1 (UL listed) EN60950-1
Emission/EMC	CFR 47 FCC part 15, subpart B (class A)
Environmental	IP30

NETWORK TOPOLOGY

1. Point to Point/Multipoint
2. Store and Forward
3. Star
4. Tree Hierarchy
5. Multi-Communication Backhaul Supported (dual/redundant link)

POWER MANAGEMENT

Voltage Management	Preconfigured thresholds based scenarios	Yes
Power voltage that can be reduced or disabled		5 power consumption options available
Power Consumption	CPU module All Radio Off: CPU module All Radio On: CPU module All Radio's On APX TX: CPU module All Radio's On LoRA RX 8 Channels: CPU module All Radio's On LoRA TX: CPU module All Radio's On LTE TX: Input module: Output module: Mixed IO module:	Max 300mA/Typical 150mA @12V (w/o SD card and USB) Max 450mA/Typical 250mA @12V (w/o SD card and USB) 1.6 A/Typical @12V 0.36A/Typical @12V 0.605A/Typical @12V 0.45A/Typical @12V Max 180mA /Typical 100mA @12V Max 450mA/Typical 250mA @12V Max 194.4mA/Typical 64mA @12V



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