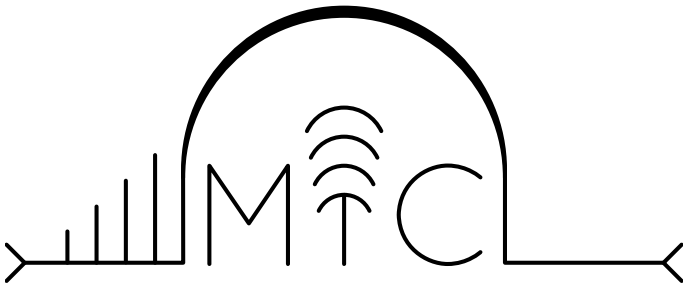


SPECIFICATIONS

PRODUCT	PORTS	COMMUNICATIONS	POWER	TEMPERATURE	AGENCY APPROVALS
Power Supply	48Vdc output - 5A - 240W	Output voltage status LED	85-264VAC	Op Temp -25C to +80C	UL 60950-1 Class 1, Div 2
Power Supply - optional 2nd	24Vdc output - 5A - 120W	Output voltage status LED	85-264VAC	Op Temp -25C to +80C	UL 60950-1 Class 1, Div 2
Router	WAN/WAN1 - 1 RJ45/Fiber combo port WAN2/DMZ - 1 RJ45/Fiber combo port LAN - RJ45/SFP combo port LAN - 1GB speeds on all above	Modbus/TCP Ethernet/IP PROFINET	12/24/48VDC - redundant dual in	Op Temp 0 to +60C	UL 60950-1 DNV - Maritime
Managed Ethernet Switch	(4) 1GB SFP Fiberoptic - Single Mode 10KM (8) 1GB PoE+ and/or 1GB T(X) ports	Modbus/TCP Ethernet/IP PROFINET	48Vdc - redundant dual in Max 240W for total PD consumption Max 36W for each PoE port	Op Temp -10C to +60C	UL 60950-1
Wi-fi (inside panel)	(2) dual-band omni-directional antennas 5dBi at 2.4GHz - N-Type female connector RJ45 1GB PoE+ Ethernet port RS-232 Console Port	802.11a/b/g/n Access Point Supports 60 clients connected concurrently	PoE+ 12-48Vdc	Op Temp -25C to +60C	UL 60950-1 Class 1, Div 2 ATEX Zone 2
Wi-fi (outside panel) IP68	(2) dual-band omni-directional antennas 5dBi at 2.4GHz - N-Type female connector RJ45 1GB Ethernet port RS-232 Console Port	802.11 a/b/g/n 2.4 GHz and 5GHz bands Access Point Supports 60 clients connected concurrently	PoE - via 48Vdc from source 12-48Vdc	Op Temp -40C to +75C	UL 60950-1
Cellular / Wifi (inside panel)	2-wire GPIO USB 2.0 (3) LAN/WAN (2) Cellular antenna (SMA) (1) active GPS antenna (SMA) (2) Wifi antenna (R-SMA) DB-9 - RS-232	802.11 a/b/g/n/ac 2.4 GHz and 5GHz bands LTE Advanced LTE/HSPA+ 4G LTE/HSPA+/EVDO Access Point Supports 60 clients connected concurrently	9-36Vdc - use 2.5A fuse	Op Temp -30C to +60C	UL 60950-1 Class 1, Div. 2
Vehicle Wi-fi Client	(2) dual-band omni-directional antennas 5dBi at 2.4GHz - N-Type female connector RJ45 1GB PoE+ Ethernet port RS-232 Console Port	802.11a/b/g/n Client Mode Turbo Roaming between Access Points	PoE+ 12-48Vdc	Op Temp -25C to +60C	UL 60950-1 Class 1, Div 2 ATEX Zone 2
Programmable Controller	RJ45 Ethernet Port RS-232C/RS-485 port - user selectable 24DC DI / 16 Relay Outputs / 6 Analog Inputs SD card Memory Slot CAN Port	Modbus/TCP and RTU CANBUS - SAE J1939 Optional Touch Screen inside vehicle	12/24Vdc or 100-240VAC	Op Temp -10C to +55C	UL 60950-1 ABS - Maritime
Dome Camera - IP66	RJ45 10/100T(x) port RJ45 PoE+ Audio Input Audio Output SDHC Socket for local datalogging	Modbus/TCP FTP File transfer HD 1280x720 - 30 FPS	PoE - via 48Vdc from source	Op Temp -40C to +50C Optional -40C to +75C	UL 60950-1
Box Camera - IP68	RJ45 10/100T(x) port RJ45 PoE+ SDHC Socket for local datalogging	Modbus/TCP FTP File transfer HD 1280x720 - 30 FPS	PoE 12/24Vdc	Op Temp -25C to +60C	UL 60950-1 Class 1 Div 2 ATEX Zone 2



MINE TUNNEL COMMUNICATIONS

THE MTC SOLUTION PROVIDES THE MOST DEPENDABLE, SECURE, AND FASTEST COMMUNICATIONS FOR THE MINING, RAIL, AND TRANSPORTATION INDUSTRIES.



NETWORK OPERATING CENTER

- Computer - Mission Critical
- Supervisory Control & Data Acquisition Software
- Network Management Software
- RFID Tag Management Software
- Report Generation

COMMUNICATION INFRASTRUCTURE

- Single Mode Fiberoptic Cable
- Flat Ring Topology - Minimizes downtime
- Industrial Managed Ethernet Switches
- Industrial Wi-fi Access Points (within panel)
- Industrial IP-68 Wireless AP (outside panel)
- Industrial Cellular - GSM or LTE

PERSONNEL AND ASSET TRACKING

- Wi-fi RFID Real-Time Location System
- Wi-fi Clients - on vehicles

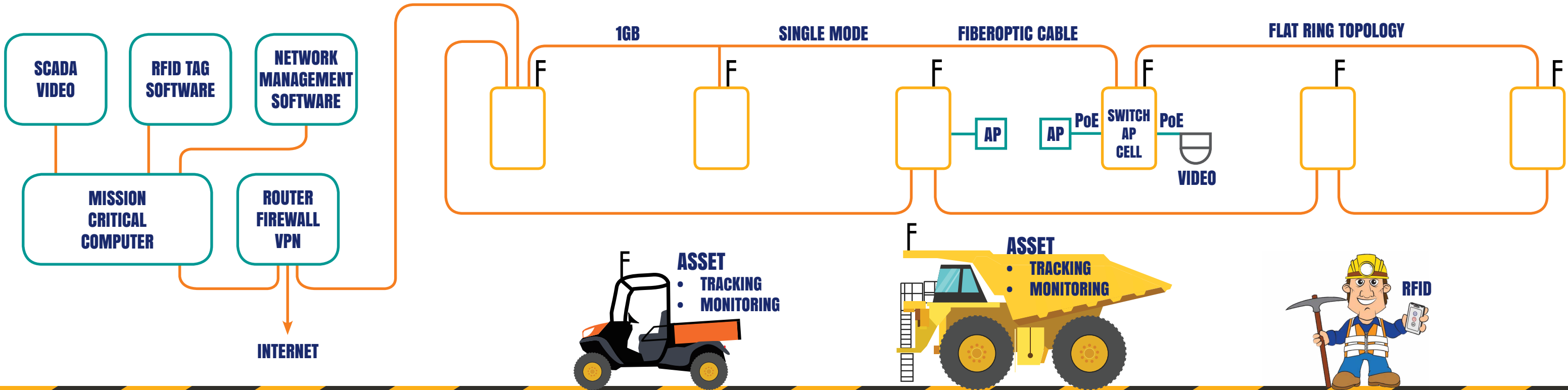
SECURITY CAMERAS & COMMUNICATION PANELS

- IR IP Cameras - Infrared Internet Protocol
- Communication Panels

FOR ORDERS:

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4400 East La Palma Ave., Anaheim, CA 92807 | www.QuantumAutomation.com/MTC

NETWORK OPERATING CENTER



NETWORK OPERATING CENTER

COMPUTER - MISSION CRITICAL

- Xeon Processor, 16GB RAM, 2TB Hard Disk
- Windows 10 Profesional
- External Hard Drive for Local Backup
- Up to (3) 27" Monitors
- Industrial Router/Firewall/VPN

SUPERVISORY CONTROL & DATA ACQUISITION SOFTWARE

- Asset Tracking
- Monitor Tunnel Operations
- View, Datalog, & Replay IP Cameras

NETWORK MANAGEMENT SOFTWARE

- Configure Routers, Switches, and Access Points
- Overlay data onto Tunnel CAD drawing
- RTLS Real time and Data Logged information

RFID TAG MANAGEMENT SOFTWARE

- Track all employees and assets in the Tunnel

REPORT GENERATION

COMMUNICATION INFRASTRUCTURE

SINGLE MODE FIBEROPTIC CABLE

- Rodent Proof, Low Smoke, Halogen Free

FLAT RING TOPOLOGY - Minimizes downtime

INDUSTRIAL MANAGED ETHERNET SWITCHES

- Provides Communications Backbone for Tunnel
- Minimum (4) 1GB SFP Fiberoptic Ports
- Minimum (8) 1GB PoE+ Ports

INDUSTRIAL WI-FI ACCESS POINTS (WITHIN PANEL)

- B, G, N (300MB), and AC (1GB) speeds
- Minimum 5dB Antennas - MIMO technology

INDUSRIAL IP-68 WIRELESS AP (OUTSIDE PANEL)

- Powered by PoE+ port from Managed Switch
- Cat 6 - RJ45 or M12 Connection up to 100 meters

INDUSTRIAL CELLULAR - GSM OR LTE

- SIM card required - Cellular plan required
- Same antenna used on Fire Trucks

PERSONNEL & ASSET TRACKING

WI-FI RFID REAL-TIME LOCATION SYSTEM

- Automated Mustering & Lone Worker Monitoring
- RFID Badge Tag User Interface
- Two call buttons and a menu button
- Two red/green signal LEDs
- Safety switch for lanyard
- Customizable Alarms
- Organic LED Display for text messaging & menu
- Customizable Display Menu
- Rechargeable Lithium Polymer battery

WI-FI CLIENTS - ON VEHICLES

- OBDII - On Board Diagnostics port = J1939 CANBUS
- Sense Discrete Inputs - Control Relay Outputs
- Sense Analog Inputs - Load/Weight, Oil Pressure, Level, Temperature, CO2, etc.
- Alarms - Two-Way to and from SCADA software
- Underground GPS based on which Access Point picks up the client signal

SECURITY CAMERAS & COMMUNICATION PANELS

IR IP CAMERAS - INFRARED INTERNET PROTOCOL

- Industrial - IP66 - HD, vandal-proof, day and night
- M12 Ethernet port - PoE
- Audio Input and Audio Output
- Dome Type - shorter distance
- Box Type - longer distances

- Mount on the Communication Panel or
- Mount on the wall via Cat 6 cable via PoE+
- Run the Cat 6 back to the PoE+ port on the
- Managed Ethernet Switch

COMMUNICATION PANELS

- Tough Polycarbonate NEMA 4X Enclosure
- Aluminum Back panel
- Stainless Steel Screws
- Low smoke - Halogen Free wire & terminal blocks
- Class 1 Division 2 Power Supply