DIGITAL WITHOUT CELLULAR

SCADA MASTERS

A DBG COMPANY

FULLY DIGITAL, NORTH AMERICAN MANUFACTURED, S.C.A.D.A. CONTROL & MONITORING SOLUTION with ENGINEERING thru IMPLEMENTATION support

REMOTE-PLANT-RADIO Serving both FRESH and WASTE WATER utilities!

LOOKING FOR an Off-the-Shelf PRODUCT to replace defunct analog Zetron or PLC RTU/MTU and other antiquated ANALOG (unreliable) ModBus systems ?

WE HAVE the SOLUTION NOW !!
We work with Manufacturers Representatives, Dealers, Integrators, and self-maintained Clients to provide a long-term solution for your company.

- Engineered Radio Propagation Studies – from P25 911 to Digital trunked radio systems to Water and Waste Water Systems.
- FCC Licensing Expertise
- High Level Dipole Antennas

BASIC INFORMATION:

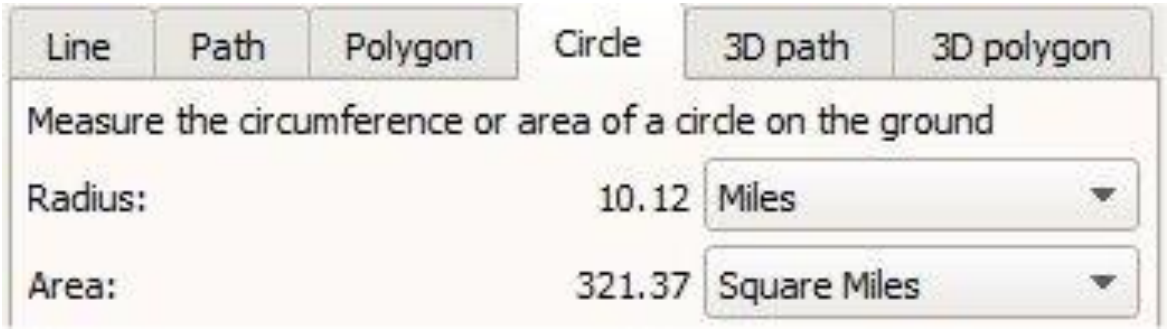
ANALOG radio and SCADA products are obsolete since atmospheric noise levels have reduced effective range.

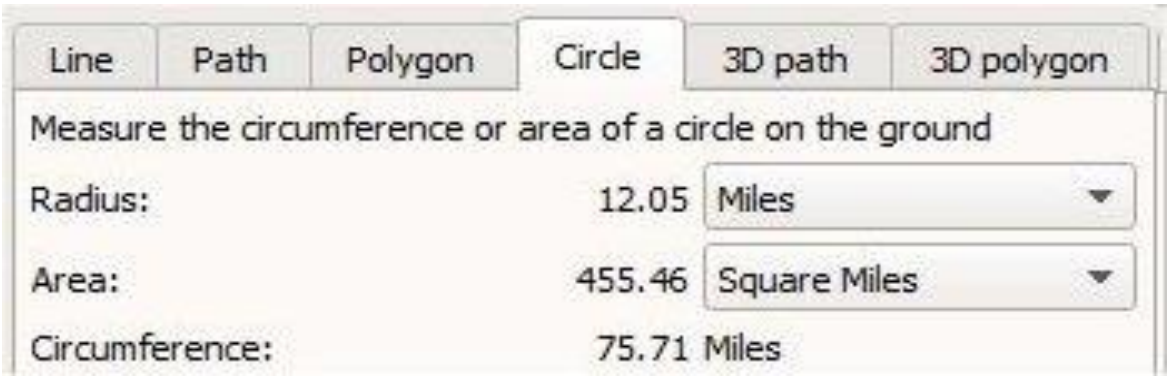
CELLULAR is the first thing to fail during catastrophic events, as shown numerous times in the past years!

ONLY a fully digital system can provide reliable service for the future!

WHAT THE EXPERTS KNOW :

NXDN DIGITAL VERY NARROW BAND increases range by 20%.





THE GOOD NEWS is that a 20% Range increase provides >40% more coverage area !!

PLUS, the elimination of all analog noise increases the radio receiver's sensitivity 100 TIMES better (20dB in engineering terms) – from -95dBm to -115dBm or better! Most VNB NXDN radios receive at -120dBm which means nearly 200 times better!

NXDN Digital:

1. **Compatible with major brand (off-the-shelf) repeaters for extended range. Many Clients are already utilizing compatible repeaters.**
2. **Made in the USA in Indiana !**
3. **Made to S-M specifications.**
4. **Military level ENCRYPTION optional!**
5. **Cost and Availability stability during unstable markets.**

SM's DIGITAL RADIO
(Made in the USA since 1977):

NXDN Digital, compatible with major brand repeaters (Kenwood™. ICOM™ and Ritron™) for extended coverage.

Proprietary FIRMWARE built to SM specifications, provides the fastest data delivery with added anti-collision and retry algorithms to assure fast data delivery. NOW ENCRYPTION option.

You likely know that most “sensors” used in automation today provide a “new technology” called “4-20 Milliamp” signal for us to calibrate our SM-NEURO analog inputs, most common being water level in a tank, but is used for hundreds of types of measurements.

This is the “INTERNATIONAL STANDARD” today.

BUT

I BET YOU DIDN'T KNOW !!

1837 (189 years ago) Samuel Morse developed the 4-20 Ma concept as well as the CODE to develop a single-wire TELEGRAPH system which was implemented coast to coast along with the railroad, the first message was sent in 1861.

1845 – Wm Channing and Moses Farmer presented the idea of FIRE CALL BOXES to the City of BOSTON. They called it the FIRE ALARM TELEGRAPH. It was installed in 1862 with 40 "call boxes" on street corners.

1859 – John Gamewell purchased the patents for$30,000 (about $1.2 Million today) with intentions to build fire alarms in most major cities… during the Civil War, the US Government SIEZED the patents for the war effort!

After the war, John Kennard bought the patents BACK from the US government and returned them to Gamewell.
1886 – installed in 250 cities.
1890 – installed in 500 cities.
2018 – a fire call box notified Boston 911 of a major fire during a 911 outage!

MANY LOCATIONS still use the 4-20Ma loop for fire alarms today.

Business Central Station Security Companies still use it today! It runs on a 6V battery, so if phone line is cut, it sets off alarm!

Teletype – both commercial and military use (military still uses morse code), as do Amateur radio stations.

Stock Market Tickers – added a paper tape (ticker tape) and a hammer to punch codes in the paper.

1920's Gamewell Fire Alarm Call Box Telegraph Station - Original Key - Clean

Pre-Owned

$549.99

Buy It Now

Free delivery

Located in United States

wv.thrifty.antiquer 100% positive (786)

The POLE ? Another $500

AND TODAY – SCADA MASTERS takes this time-proven technology to the ULTIMATE LEVEL !

PRESENTING A TOTALLY DIGITAL SOLUTION FOR YOUR POTABLE and WASTE WATER SCADA REQUIREMENTS.

SCADA MASTERS has SIMPLIFIED The components to fit the smallest to the largest system… buy ONLY WHAT YOU NEED!

In essence, SCADA solutions have only THREE (3) components in an RTU:
ANALOG INPUTS
DIGITAL INPUTS
RELAY OUTPUTS

INTRODUCING the SCADAMASTERS INTELLIGENT RTU version of the DAVICOM NEURO!

SM's DIGITAL SCADA products are based on the proven products from DAVICOM *(Made in North America for 40+ years!).*

Whether you need two sites or hundreds, the SM-NEURO works stand-alone or peer to peer for site management.

It may be POLLED & MANUALLY CONTROLLED by the SM-CORTEX (MTU) for total management, visual displays, logs, alarms, and notifications.

SM-NEURO

The SM-NEURO is basically MULTIPLE Programmable INTELLIGENT RTUs in a single package that has already been 90% programmed … just simply adjust Inputs and Outputs to match each SITES needs.

CUSTOM CONTROL IN ONE SMALL PACKAGE

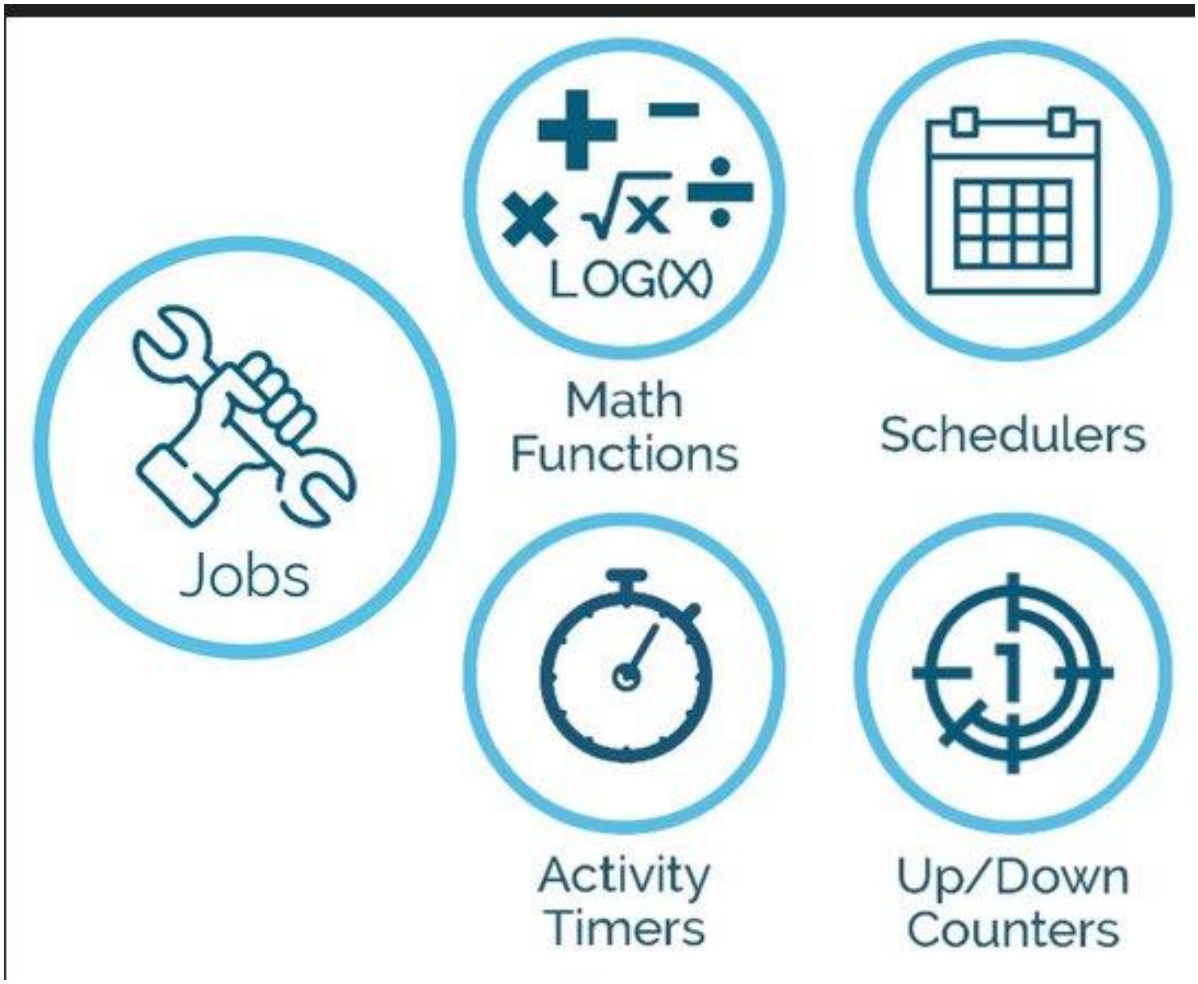
LOCAL SITE MANAGEMENT provides operation without a MASTER controlling it! The SM-NEURO will be the only required component at a co-located Pump/Valve/Tank site !

SM-NEURO can be equipped with up to five(5) "boards" providing up to 5 Relays, and 8 Analog or 8 Digital inputs per board!

A "typical" SM-NEURO has 3 boards (Analog, Digital, and a Relay board with 5 relay outputs).

SM-NEURO

BUILT-IN INTELLIGENCE



EVERY EVENT LOGGED

STOP and THINK "What do I really need at a site" instead of "what are my current limitations?"

The SM-NEURO intelligently provides hundreds of features with built-in:

- **Calendar**
- **Timers**
- **Counters**
- **Math Functions**
- **Sunrise/Sunset calcs**
- **Event Logging**
- **Pump/Valve rotation/management**
- **Remote control**

ANALOG PORTS:

- Water Levels – transducers.
- Water Flow.
- Temperature.
- Humidity.
- Battery and Power Levels with automatic switching to BACKUP.
- Solar Charging levels.
- Lightning Detection.
- Radio Power Output and Antenna Efficiency.
- HVAC monitoring/efficiency.
- Control relays (locally or at other sites).
- 12 Bit (2048 levels) vs 256 levels at 8 Bit logic.
- Up to 40 in one SM-NEURO if needed.
- And MANY MORE!

DIGITAL PORTS:

- AC Power Failure (if you have AC)!.
- Security – Entry,
- Pulse Counters
- Added function (control relays or relay outputs control digital inputs).
- Negative (go low) or Positive (go high) logic switching.
- Monitoring functions, such as radio Keying (Push to Talk) , time in use.
- “Anything” that has a logic shift.
- Up to 40 in one SM-NEURO if needed.
- And MANY MORE! You will think of a lot more !

RELAY OUTPUTS:

- 5 available in NO-C-NC (SPDT) configuration.
- Turn on/off Valves, Pumps, Lights, Security, or any other ON or OFF function whether LOCALLY or REMOTELY actuated by an SM-NEURO or by the CORTEX MTU Primary Controller.
- Pulse Counters
- Added function (control relays or relay outputs control digital inputs)..
- Monitoring functions, such as radio Keying (Push to Talk) , time in use.
- “Anything” that you wish to command.
- Switching Radio Channels, Backup Power, etc.

PEER TO PEER OPERATION !

Each OPERATION in your system is A STAND-ALONE SUB-SYSTEM!
Why have to send a request to the Commander at Headquarters, wait for its decision to be implemented, when the INTELLIGENCE is in the FIELD, and can work efficiently and autonomously, even if all the other sub-systems should not be functioning?

EXAMPLE: A Tank needs water or the sewage level is too high, The Tank requests its PEER (in same or remote location) to open a valve (or valves) , or turn on pumps to fill the tank.

COMPLETED in SECONDS!

PEER TO PEER OPERATION !

Since the distance is typically CLOSER, radio signals are stronger , commands are sent and acknowledged in short BURSTS of digital traffic without multiple REPEATS and radio channels collisions. (The digital radios have a developed algorithm to prevent collisions AND sends just 12 bits of data for a complete command). This is less than 2 seconds typically!

The SM-NEURO also calls the MTU SM-CORTEX with any alarms or anomalies, so it may provide alarm and call-out procedures, and handling efficiency.

POWER REQUIRENTS !

LOW POWER CONSUMPTION allows the SM-NEURO, Digital Radio, and SCADA components to be powered from a 12VDC BATTERY!

SM-NEURO uses 150-300 MA (.15 - .3 amps) maximum.

The radio adds 100 Ma RX and 2A to 7 amps during short TX times.

SOLAR power and battery can be configured to completely power the SCADA MASTERS RTU site .

MANAGEMENT !

Since ALL SCADA MASTERS products are BROWSER BASED, total management and changes may be made with a low-level computer.

Each RTU/MTU sites Configuration Files may be stored on a PC (or even thumb drive) and reloaded in a few seconds. ONE backup NEURO can be easily programmed for a specific site and implemented rapidly if a disaster happens. The entire system uses your favorite browser to access the device.

On-site monitoring, adjusting, management, all at your fingertips.

DEPLOYABLE BACKUP SOLUTION !

NEURO, RADIO, PWS, BATTERY ready to connect to sensors and antenna at any site, or powered by a vehicle. Just load the sites CONFIGURATION and go!

Waterproof case with wheels and pull handle. Airplane Carry-On size.

SM-CORTEX 320

Complete MASTER Remote Site Management Solution With POLLING, Customizable GUI, EMAIL, VOICE ANNOUNCEMENTS, SNMP Manager

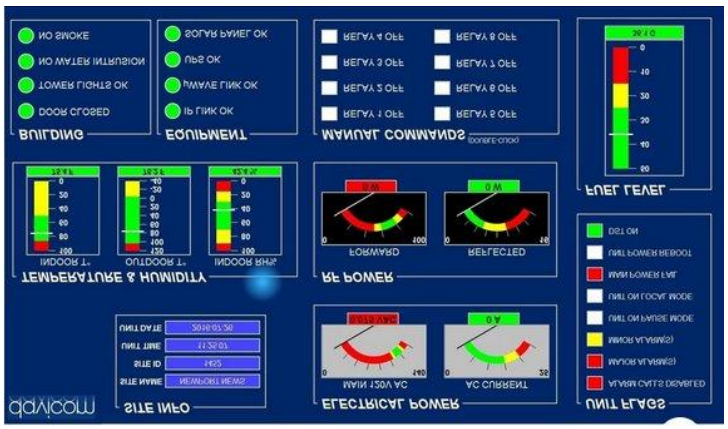
CENTRAL MONITORING, POLLING, REMOTE WEB ACCESS

Advanced Site Management Solution with:

- VOICE ANNOUNCEMENTS over RADIO or PA.
- EMAIL alarms to multiple users.
- LOGGING to easily recall events.
- REMOTE ACCESS via INTERNET with built-in GRAPHICS display, customizable.
- From SIMPLE “METER or BAR” style graphics to industry related graphics of Water Tanks, Pumps, Valves and Flow Metering.
- POLLING of sites to retrieve current data, assure they are awake, and working! Timing of polling is programmable. Does not “stop” when a site does not answer !!

SM- CORTEX 320 /2P-RS

GRAPHICS and FEATURES to suit your needs, built-in complete graphics manager OR add a library of graphics to match your old system.



CENTRAL MONITORING, POLLING, REMOTE WEB ACCESS

SM- CORTEX 320 /2P-RS

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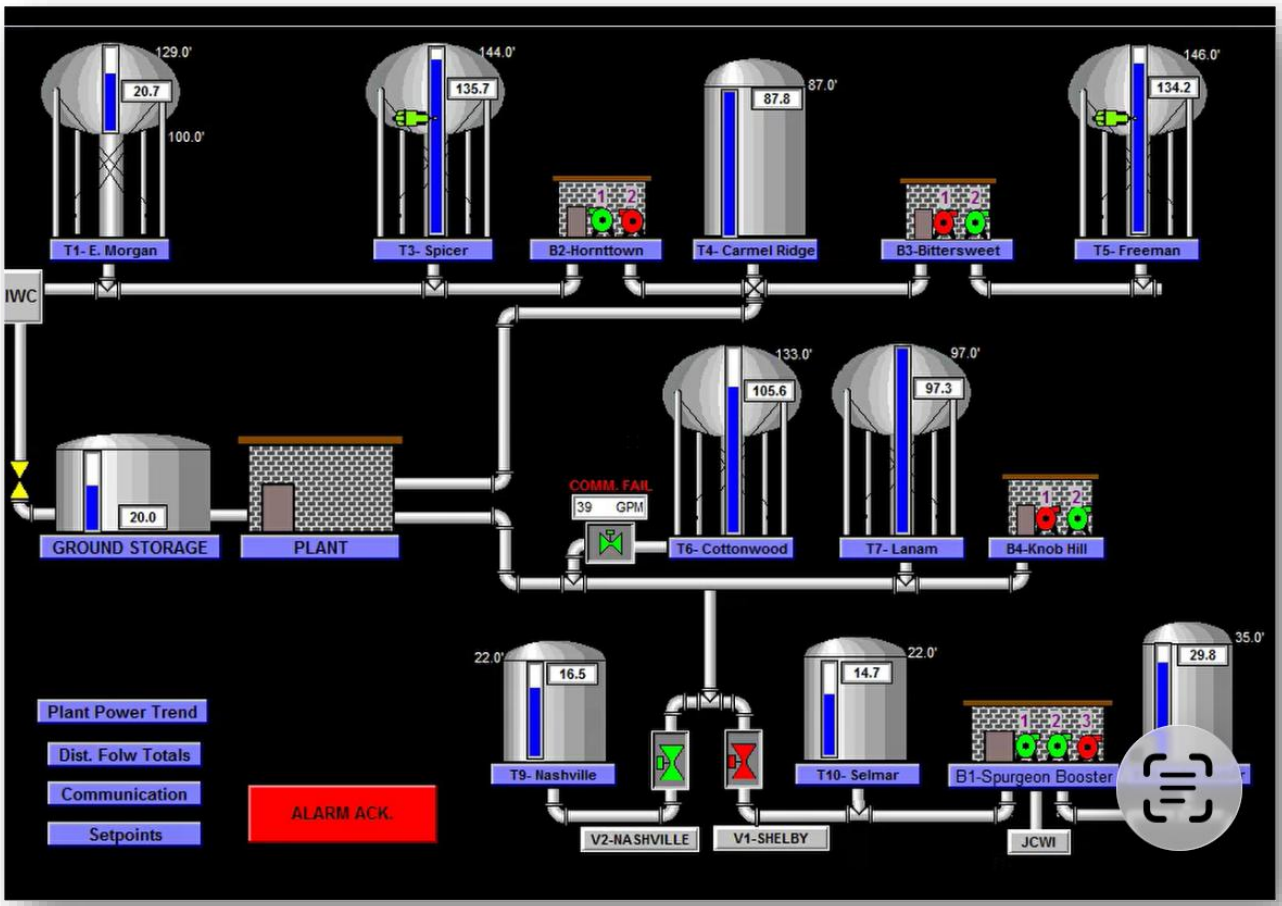


CENTRAL MONITORING, POLLING, REMOTE WEB ACCESS

SM-COREX 320 - Internal

- 12 “VERSATILE” inputs (analog or digital).
- 4 ANALOG inputs.
- Activity Monitoring and Cumulative RUN TIME on all inputs.
- Audio Input or Output for monitoring audio OR audible voice alarms.
- 6 RELAYS (3 Type C NO C NC) and 3 Type A/B with individually selectable NO or NC.
- AUX A+ OUTPUTS 5VDC and 12VDC
- SERIAL PORTS
- INTERNAL MODEM
- 2 PORT USB HUB
- NETWORK RJ-45 PORT
- RealTime Clock (RTC) with 10 year battery.

SM-COREX 320 – Cont.

- 128 Virtual Logic Gates for Automated ACTIONS and CONTROLS
- 128 Virtual Relays for Automated ACTIONS and CONTROLS
- 64 EVENT SCHEDULERS – to Trigger OR Mask calendar-based events.
- 16 I/O Counters with Limits & Resets
- 16 I/O Activity Monitors (Logs)
- 16 built-in MATH FUNCTIONS to precisely control
- SNMP Agent and Manager (optional)
- Smart Phone APPS for IOS / ANDROID
- Multiple ALARM MODES Voice, SMS, E-Mail (with TXT & XML attachments), SNMP TRAP,
- Smartphone Notification, Pager, FAX, DavNet (Dial-up & IP)
- DC CURRENT ONLY 275 MA – perfect for battery / solar.

SM-COREX 320

The SM-CORTEX receives alarms and notifications DIRECTLY from SM-NEUROS

And POLLS the NEUROS to obtain STATUS FUNCTIONS.

The POLLING requirements are determined by system size.

The SM-NEURO also allows an OPERATOR full control over NEURO RTU devices!

SM-COREX 320 - Internal

SM-NEURO, SM-CORTEX, and DIGITAL RADIOS provided by SCADA MASTERS provide a TWO-YEAR limited factory warranty against defects in manufacturing per published specifications. See scadamasters.com for details.

SYSTEM OVERVIEW :

Each RTU field site includes an SM-NEURO with the necessary ports for that site, a digital radio, power supply, and backup power that includes battery and Solar Panel as desired. DIN RAIL mounting is the norm. Exact components are listed in a Quotation and any and all contracts.

Typical RTU sites include Water Tanks of any style, valve pits/stations, pump stations, and flow measurement locations if at separate location.

Additional sensors are available as an option from Scada Masters.

SYSTEM OVERVIEW :

Each MASTER CONTROL LOCATION site includes an SM-CORTEX 320 or 360 with the necessary ports for that site, a digital radio, power supply, and backup power that includes battery and Solar Panel as desired. DIN RAIL mounting is the norm.

CLIENT provides any and all sensors, AC power, Network, Existing cabinetry and antenna systems in accepted and proper order. Internet is required for remote broadcast of alarms.

SCADA MASTERS and CLIENT determine the method and setup of the GRAPICAL DISPLAY INTERFACE, along with POLLING REQUIREMENTS.

SYSTEM OVERVIEW :

SM-CORTEX provides a variety of alarm methods as well as remote access to the SM system for management purposes.

Multi-Level SECURITY is provided.

The system is BROWSER BASED and allow access to the system from anyone allowed either locally on the internal NETWORK or REMOTELY via APP or VPN.

VALUE ADDED FOR INTEGRATORS with SCADA Masters

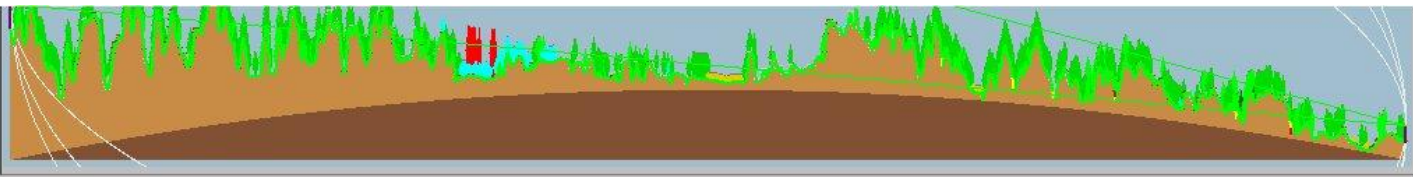
What Integrators Gain When Partnering with SCADA Masters:

- **Easy-to-Program, Browser-Based Software**
  Built-in configuration tools — no proprietary software required
- **RF Engineering Expertise**
  Designed and supported by experienced radio engineers
- **FCC Licensing Support**
  Guidance through licensing requirements and compliance
- **High-Performance Dipole Antennas**
  Optimized for reliable long-range communications
- **Radio Systems Built to Perform When Cellular Fails**
  Mission-critical communications without cellular dependency

RF ENGINEERING

POINT to POINT and POINT to MULTIPONT
RF Engineering and analyses supports VARS, DEALERS and END-USERS to properly design RF systems to meet standards and work properly.

LOW COST – RELIABLE GEO-BASED PROPAGATION. SAMPLE – 33 FOOT ANTENNA



PAT WP to Oak Valve 33' Ant*

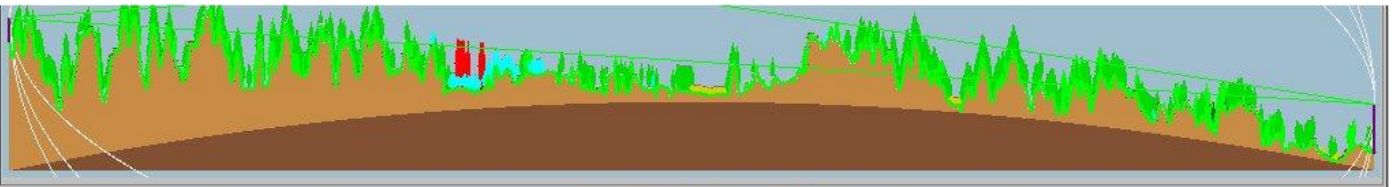
Patoka Water Plant (1)		(2) Oakland City Valve	
Latitude	38.412004 °	Latitude	38.342820 °
Longitude	-86.730778 °	Longitude	-87.334479 °
Ground elevation	204.0 m	Ground elevation	137.1 m
Antenna height	15.0 m	Antenna height	10.0 m
Azimuth	261.87 TN | 266.65 MG °	Azimuth	81.50 TN | 85.85 MG °
Tilt	-0.32 °	Tilt	-0.16 °

Radio system		Propagation	
TX power	43.98 dBm	Free space loss	111.70 dB
TX line loss	1.00 dB	Obstruction loss	30.65 dB
TX antenna gain	10.20 dBi	Forest loss	2.48 dB
RX antenna gain	3.00 dBi	Urban loss	1.00 dB
RX line loss	0.00 dB	Statistical loss	19.23 dB
RX sensitivity	dBm	Total path loss	165.06 dB

Performance	
Distance	**53.184 km**
Precision	26.6 m
Frequency	173.375 MHz
Equivalent Isotropically Radiated Power	207.941 W
System gain	189.20 dB
Required reliability	95.000 %
Received Signal	-108.88 dBm
Received Signal	0.81 µV
Fade Margin	**24.14 dB**

RF ENGINEERING

SAMPLE – 100 FOOT ANTENNA



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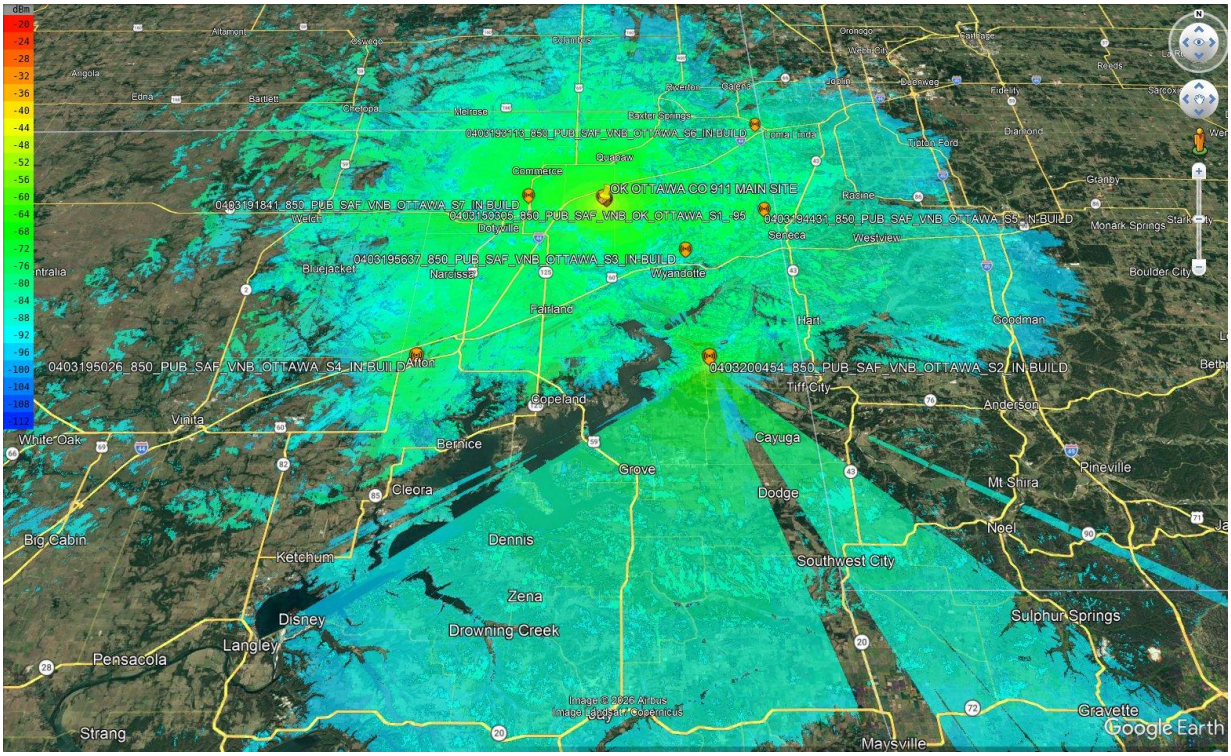
Ground elevation	204.0 m	Ground elevation	137.1 m
Antenna height	15.0 m	Antenna height	30.0 m
Azimuth	261.87 TN | 266.65 MG °	Azimuth	81.50 TN | 85.85 MG °
Tilt	-0.30 °	Tilt	-0.18 °

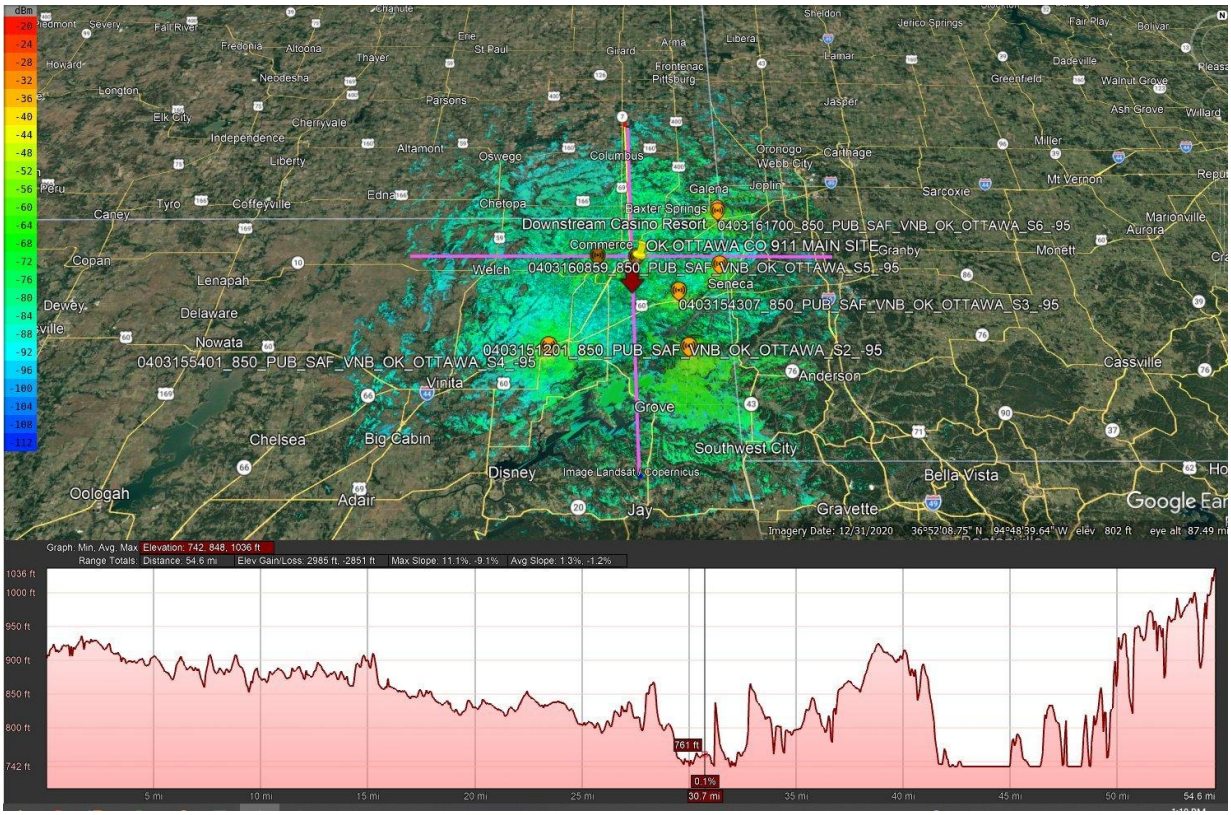
Radio system		Propagation	
TX power	43.98 dBm	Free space loss	111.70 dB
TX line loss	1.00 dB	Obstruction loss	24.89 dB
TX antenna gain	10.20 dBi	Forest loss	2.34 dB
RX antenna gain	3.00 dBi	Urban loss	1.00 dB
RX line loss	0.00 dB	Statistical loss	19.22 dB
RX sensitivity	dBm	Total path loss	159.15 dB

Performance	
Distance	**53.184 km**
Precision	26.6 m
Frequency	173.375 MHz
Equivalent Isotropically Radiated Power	207.941 W
System gain	189.20 dB
Required reliability	95.000 %
Received Signal	-102.98 dBm
Received Signal	1.59 µV
Fade Margin	**30.05 dB**

Multiple Studies done for the same Sites proving required height and power requirements for the desired location.

RF ENGINEERING





ANTENNAS

SCADA MASTERS delivers rugged, broad bandwidth, FOLDED DIPOLE ANTENNAS at a very competitive price, and FREE SHIPPING if over $500.

DIGITAL WITHOUT CELLULAR

SCADA MASTERS

A DBG COMPANY

LOCALLY REPRESENTED by

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With REPRESENTATIVES across the UNITED STATES, PUERTO RICO, and the VIRGIN ISLANDS