
MICROCOM
ENVIRONMENTAL
™

NOAA DCS Projects

- Binary Protocol:
  - Will bring whole new message option to the NOAA GOES DCS.
  - Includes special Compaction modes to allow quick transition to Binary that will provide backward compatibility for existing ASCII and Pseudo Binary messages.
  - Special modes will provide for use of existing decoding scripts now, but allow for more data in the future due to improved efficiency.
- Lat/Lon/TxID Messages:
  - Will help users and NOAA keep platform management information (DADDS) accurate and up to date.
  - Special messages will be sent by DCPs upon deployment and redeployment.
- DCPC Implementation:
  - Will bring remote commanding to DCPs to better manage the DCS system.
  - Current focus is to enhance DADDS to support DCPC.

MICROCOM ENVIRONMENTAL

SmallSat DCS Project

- Working with NOAA, NASA and on proof of concept to allow SmallSats (aka CubeSats) to utilize International DCS system.
- SmallSats/CubeSats will benefit from global DCS coverage.
- NOAA and EUMETSAT could benefit from reduced probability of interference from Space to Ground transmission in nearby bands.
- Planning for joint NOAA and EUMETSAT testing.
  - Next launch hopefully summer of 2024.
  - Subsequent launch hopefully in fall of 2024.
  - Could conceivably have two SmallSat DCS transmitter in low earth orbit simultaneously.

MICROCOM ENVIRONMENTAL

Enhanced DCP Standard Project

- Have been working with NOAA, EUMETSAT and other CGMS organizations over the last year to develop new DCP standard that will provide common and more robust RF communications.
- New standard will augment, not necessarily replace, current regional and domestic formats.
- Initial use will most likely be on International DCS for such applications as SmallSats and/or or environmental projects that could benefit from worldwide coverage and/or robust communications (e.g. ocean buoys).
- Key concept of new standard is to allow implementation on existing receive and transmit hardware with only software/firmware changes.
- Planning to begin development work in summer of 2024.
    - Initial implementation could also be useful to test possible extension to Binary Protocol to add Reed Solomon Forward Error Correction coding.

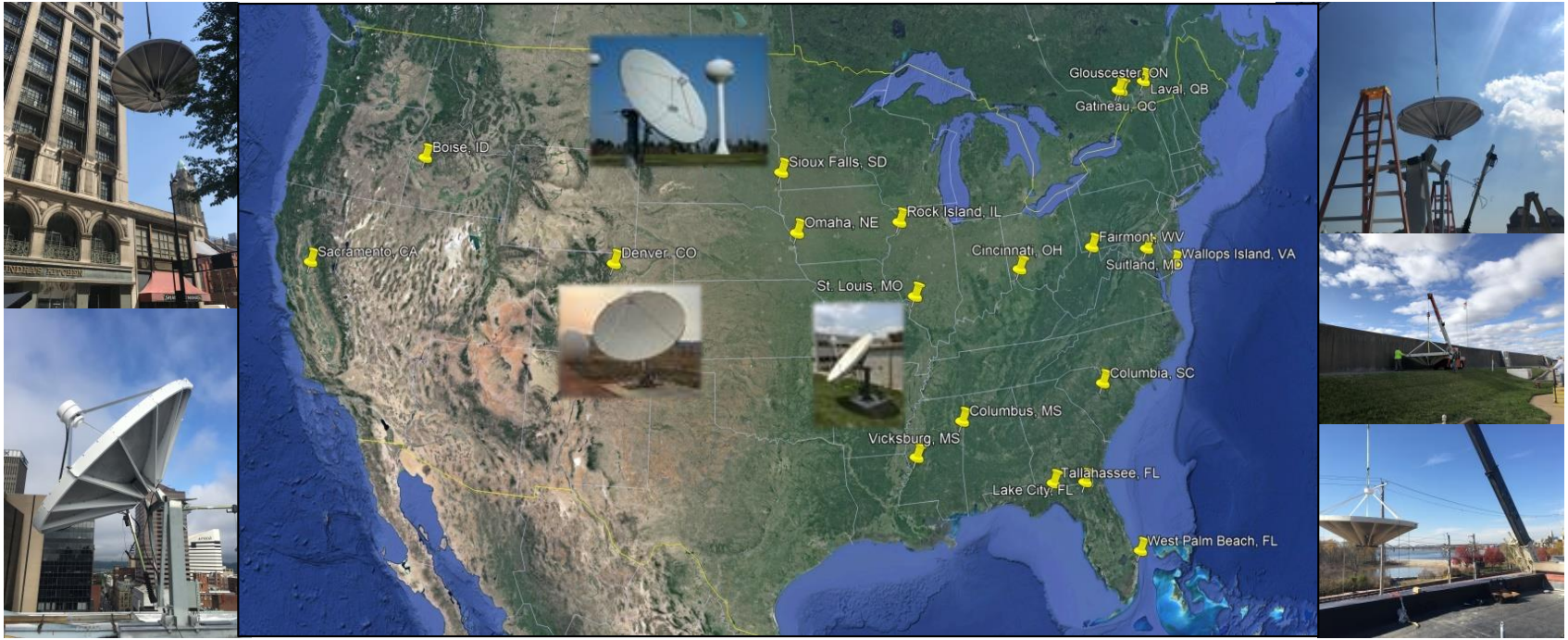
MICROCOM ENVIRONMENTAL

Microcom *DigiTrak* Receivers

- DAMS-NT *DigiTrak* Direct Readout Ground System
  - Direct Reception from the GOES Satellite
  - Lowest latency, highest reliability
  - Nearly 50 systems delivered and deployed since 2003
- Rack (200+ Channels) and Desktop (4-16 Channels) Versions
- Some Recent Installation News
  - 2020-2023: Upgraded all USACE Sites:
    - Sacramento, CA; Omaha, NE; Vicksburg, MS; Saint Louis, MO Cincinnati, OH; Rock Island, IL ; and Columbus, MS
  - 2018-2023 Seven Desktop DAMS-NT system sold to Ott Hydromet
  - Recently contacted by TVA to possibly restore their DRGS
- **Recently developed new LNB for both DCS and HRIT to address product discontinuance by Quorum.**

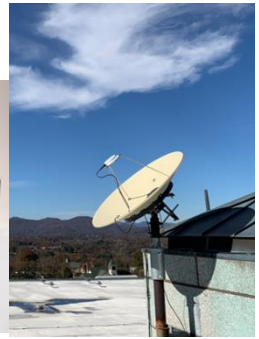
MICROCOM ENVIRONMENTAL

Sampling of North American DRGS Sites



DigiRIT HRIT Receive System

- System Characteristics:
  - Easy installation with 2 people - Multiple mounting options for various site configurations
  - Does not require a dedicated computer - transfers data via an Ethernet connection
  - GOES retransmission with complete DCS channel coverage and low latency
  - East and West satellites provide opportunity for redundancy and backup
- Utilization Summary:
  - Over 50 *DigiRIT* systems have been delivered and deployed since 2012
  - USACE alone has nearly 30 *DigiRIT* systems deployed
  - Other users include USGS, NIFC, BOR, BC Hydro, Alberta Environmental
- **May 2024:**
  - **2ND USGS *DigiRIT* Install at the HIF2 in Tuscaloosa, AL**

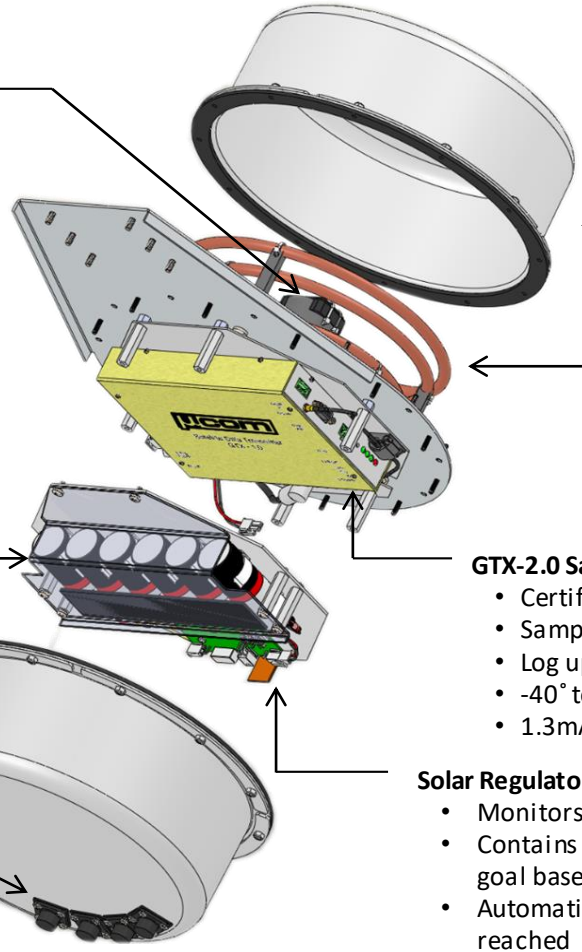


MICROCOM ENVIRONMENTAL

The XPress

- Fully integrated GOES DCS Data Collection Platform
  - GTX-2.0 Satellite Data Transmitter & Logger
  - UB6 Satellite Transmit Antenna
  - 5 Watt Solar Panel
  - GPS Antenna
  - Internal Battery Pack
  - Solar Regulator
- Lightweight
- IP66 Enclosure
- Extremely cost-effective

MICROCOM ENVIRONMENTAL



GPS Antenna
- Ensure Accurate Transmission Time
- Calibrate the Onboard 10MHz VCXO

UV Resistant ABS Plastic Shell
- Neoprene Gasket Seal
- IP66

UB6 Transmit Antenna
- 6 dB Gain
- 3 dB Beam Width of 78°
- Right hand circular polarized
- Transmits Data at 402MHz

12V 4.5aH Battery Pack
- Absorbed Glass Mat Construction

GTX-2.0 Satellite Data Transmitter & Logger
- Certified for GOES, EUMETSAT, INSAT, and Himawari
- Sample up to 64 total sensors parameters
- Log up to 250,000 entries
- -40˚ to 60˚C operating temperature
- 1.3mA quiescent current

External Connections
- Solar Panel
- RS-232
- 2 SDI-12/TB

Solar Regulator/Battery Charger
- Monitors battery temperature
- Contains a Microcontroller that calculates the charge goal based on temperature
- Automatically stops charging when that goal is reached
- 30 microampere quiescent current

MICROCOM ENVIRONMENTAL

Deployment Options

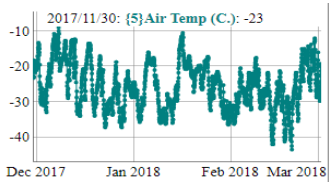
- Long-Term
- Seasonal
- Rapid
- Extreme Locations

- Versatility and Flexibility
  - Monitor rivers impacted by snow melt in spring and early summer
  - Change sensors and monitor drought and fire conditions in summer and fall
  - Additional sensing in advance of extreme weather
  - Post-flooding and post-wildfire monitoring
  - Temporary replacement for destroyed DCPs

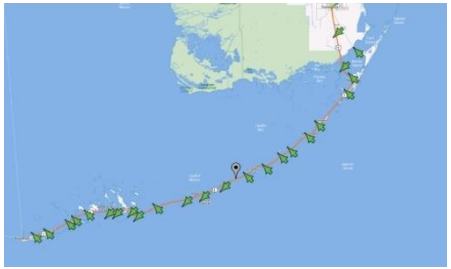
MICROCOM ENVIRONMENTAL

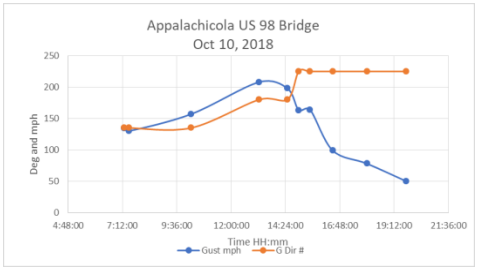
Example XPress Deployments

- The De Beers Mining Company has units installed in Yellowknife, Canada (Latitude 62° North)
  - In winter months units operate in temperatures ranging from -10°C to -40°C, heavy snow, and limited sunlight



- Over 80 XPress units are deployed throughout Florida for the Florida Department of Transportation to monitor wind speed/direction and other sight specific parameters
  - 26 units are deployed along US1 in the Florida Keys
    - During Hurricane Irma units recorded wind gusts as high as 140 mph.
  - 50 units are deployed throughout the Florida Panhandle
    - During Hurricane Michael units recorded wind gusts of up to 208 mph





MICROCOM ENVIRONMENTAL

GTX-2.0 and GTXO-2.0

- **GTX-2.0 Satellite Transmitter and Datalogger**
  - ARGOS/SCD and INSAT satellite systems
  - Integral SDI-12 and Tipping Bucket inputs
  - Built-in statistical processing and custom equation execution

  Recently developed custom interface to provide connectivity to special wildlife ID tag system for Alaska Fish and Game for deployment this summer.

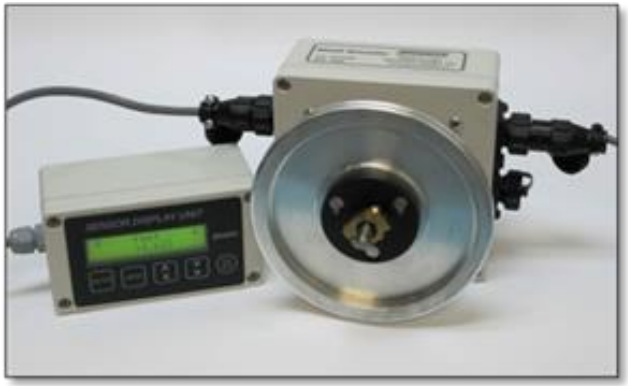
- **GTXO-2.0 Satellite Transmitter Only**
  - NOAA Certified in 2023
  - Soon to be EUMETSAT Certified
  - Same proven transmitter technology and design as the GTX-2.0

  Participating in project that will provide 200 GTXO-2.0 units for installation in the United Republic of Tanzania for Integrated Water Resources Management using EUMETSAT DCS service.

MICROCOM ENVIRONMENTAL

SDI-12 Interfaces and Sensors

- Microcom manufactures and sells a wide variety of SDI-12 interfaces
  - Measuring wind speed, wind direction, air temperature, barometric pressure, solar radiation, and water level
  - SDI-12 Interfaces are packaged in NEMA IP66 enclosures



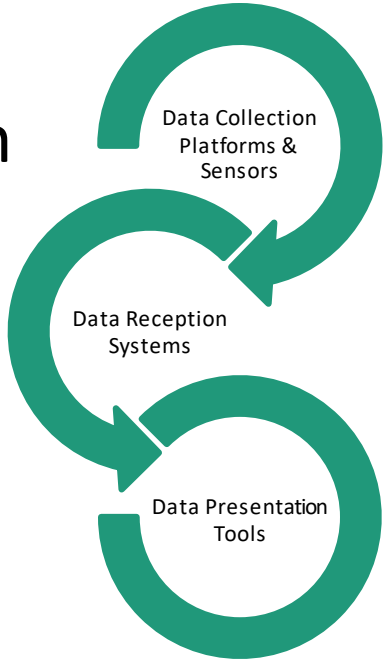
- MagShaft – Absolute Magnetic Shaft Encoder
  - uses magnetic sensing to accurately measure the rotational position of its input shaft - no gears or mechanical connections; low torque and inertia
  - SDI-12 Interface and optional display readout
  - Does not lose position or ability to sense rotation when SDI-12 is disconnected or powered down.

27 units recently sold to North Side Canal Company to help monitor canals and ditches in the Snake River Plain Aquifer in Idaho.

MICROCOM ENVIRONMENTAL

Microcom DCS Solutions

Data Collection to Data Presentation
Designed and Built in the USA
Questions?



MICROCOM ENVIRONMENTAL

Points of Contact

Brett Betsill
President
BBetsill@MicrocomDesign.com
410.771.1070 x121

Craig Pulford
Vice President
CPulford@MicrocomDesign.com
410.771.1070 x126

Sara Orrell
Office Manager and Inside Sales
SaraO@MicrocomDesign.com
410.771.1070 x110

Roger Henry
International Sales
rhenry@microcomdesignint.com
514.952.3447

Matt Taylor
RF Engineer/Technical Support
MattT@MicrocomDesign.com
410.771.1070 x143

Steve Scott
Senior Technician/Tech Support
MattT@MicrocomDesign.com
410.771.1070 x143

International Partners

Omnimetrix
3465 Rue Ashby
Saint Laurent, QC H4R 2K3
514.684.1004
roger@omnimetrix.com

SIMTECH Representações Ltda
Praça Pio X, 55 – SI 903, Candelária
Rio de Janeiro, RJ 20040-020, Brasil
21 2506 5900
simtech@simtech.com.br

MICROCOM ENVIRONMENTAL