History of Microcom

• 1975 – Founded as Microcom Design, Inc.
  • Headquartered in Hunt Valley, MD
  • Focused in Design Engineering, RF Engineering, & Electrical Engineering
• 2003 – Contracted by NOAA to design and build the then-new GOES DCS Receive Systems at National Satellite Operations Facility (NSOF) & National Environmental Satellite, Data, & Information Service (NESDIS)
• 2003 – Developed Microcom’s first GOES DCS Transmitter
• 2008 – Hired personnel with over 90 years of collective experience in Hydrology, Oceanography, & Meteorology to head product development & system design for Microcom Environmental
• 2017 – Formally separated the company into two divisions: Microcom Design & Microcom Environmental
Microcom Environmental Today

• Over 3,500 Satellite Data Transmitters, 55 HRIT Receive Systems, & 34 DRGS Systems deployed across North, Central, & South America – as well as monitoring networks in the Caribbean, Central & South Asia, Africa, & Europe

• Ongoing work with:
  • U.S. Geological Survey
  • NOAA
  • NASA
  • U.S. Bureau of Reclamation Pacific Northwest Region
  • U.S. Army Corps of Engineers
  • National Weather Service
  • National Interagency Fire Center

• 24 Employees

• All Microcom products are manufactured in Hunt Valley, MD
Complete Data Solutions

- Data Collection Platforms
- Data Reception Systems
- Data Presentation Tools
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
• Mounting & Solar Panel options available
• Extremely cost-effective
**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

**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
- Used to break out SDI-12 connection from GTX 2.0 to XPress enclosure

**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

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

**12V 4.5aH Battery Pack**
- Absorbed Glass Mat Construction

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Long-Term Deployment

- Quick & easy set-up
- Cost-effective & versatile mounting options for various applications
- Replaces the need for gage houses and enclosures
Seasonal Deployment

- Monitor rivers impacted by snow melt in spring and early summer
- Change sensors and monitor drought and fire conditions in summer and fall
Rapid Deployment

- Additional monitoring in anticipation of extreme weather and flooding
- Post-flooding & post-wildfire monitoring
- Temporary replacement for destroyed DCPs after extreme weather
Extreme Applications

• 7 XPress units deployed in Yellowknife, Canada for the De Beers Mining Company to monitor lake water levels
• All 7 continue to operate in constant sub -20°C, heavy snow, and limited sunlight during the winter months
Extreme Applications

• Over 75 XPress units were deployed throughout Florida for the Florida Department of Transportation to monitor wind speed/direction and other site-specific parameters.
• 26 units deployed throughout the Florida Keys during Hurricane Irma
  • Recorded wind gusts of up to 140 mph.
• 50 units deployed throughout the Florida Panhandle during Hurricane Michael
  • Recorded wind gusts of up to 208 mph.
Configuring the XPress

• The XPress has 4 external connectors
  • Solar Power, RS-232, & 2 SDI-12/Tipping Bucket connectors
• The XPress can be configured using the provided RS-232 cable and GTX Utility software
  • The GTX Utility is provided with all units and can be downloaded on the GTX webpage
  • Tutorials on using the GTX Utility can be found on Microcom Environmental’s YouTube Page
SDI-12 Interfaces

- The XPress utilizes SDI-12, but Microcom offers SDI-12 interfaces for all other common sensor data communications protocols
- All SDI-12 Interfaces can be packaged in NEMA IP66 enclosures
- Microcom also offers the XTend, an additional sensors breakout interface
Mounting

- Stainless Steel U bolt (1 – 3.5” diameter poles)
- Stainless Steel V bolt (1 – 3.5” diameter poles)
- Stainless Steel Band-it Clamps for larger poles and towers
Aiming

- The integrated UB6 antenna has a gain of 6dBi with a 3dB beamwidth of 78 degrees
- Use dishpointer.com for elevation, azimuth, and direction
- The Stainless Steel Mounting Bracket can be adjusted for 5° - 85° elevation
Maintenance

• The only routine maintenance needed is changing the battery packs.
• For the most part, this should be done every 5 years.
• To replace the batteries, remove:
  • 12 Nylon Locking Nuts
  • Bottom Cover
  • Connection Cables
  • Retention Plate
  • Neoprene Gasket
• It is important to replace the Neoprene Gasket Seal when changing the batteries.
Receive Systems

• DAMS-NT DigiTrak Direct Readout Ground System
  • Direct Reception from the GOES Satellite
  • Lowest latency
  • Most reliable
  • ≥ 3.7 Meter Dish

• DigiRIT HRIT Receive System
  • Rebroadcast of all DCS messages
  • Roughly 20 – 25 second Latency
  • Low-cost
  • 1.5 Meter Dish
DigiRIT HRIT Receive System

• Easy installation with 2 people
• Multiple mounting options for various settings
• Independent from DADDS & the internet for enhanced data reliability
• Does not require a dedicated computer
  • Transfers data via an Ethernet connection
DigiRIT DAMS-NT Software

- DAMS-NT DCP: Common DCS message dissemination protocol supported by most DRGS systems.
- DAMS-NT HiQ: DCS message protocol that supports the Hi-Quality message statistics for better platform performance monitoring.
- SQL Database Option: Message parameters, signal quality statistics, and message data (raw and decoded) stored in user provided database.
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