CONNEX 3D™

FLEXIBLE CELLULAR MODULE

DESCRIPTION

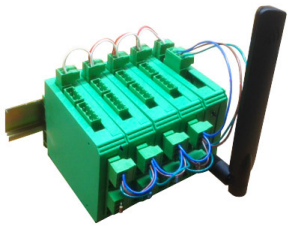
FLO-CORP introduces the patent pending CONNEX 3D™ Cellular Modem. The industry's first process cellular monitor that communicates to field and host devices via RS485 and transmit wirelessly through cellular data transmission to cloud based server. The server data can be displayed on any PC, Smartphone, Tablet, any device with a Web Browser. From point A to point B, the CONNEX 3D provides the user flexibility to configure any standard analog input or RS485 Modbus input using a laptop or PC USB direct programming setup tool for monitoring setup and diagnostic interface. The CONNEX 3D Cellular Modem offers the added benefit of connecting multiple field devices into one monitor for signal data plan networking measuring multiple field devices. The added cost savings of single data plan monitoring can now be a reality for multiple device applications such as tank farms, process flow monitoring, remote pump stations monitoring and more. Data gathering has never been easier. The CONNEX 3D cellular monitor includes a built-in data logger with up to 32,000 samples of data stored for field retrieval and/or cellular transmission in one upload. Now, even when cellular connectivity is lost, your measuring data isn't. The network capabilities are cutting edge, featuring compatibility with LPWAN networks, cellular networks, point-to-point networks, and wired networks. The CONNEX 3D Display, bright 6 digit LED field or panel display is compatible with the new CONNEX 3D modem so now the field signal can also be displayed in the field for plant operations and easy prompting of measurement conditions. FLO-CORP's cost-saving hardware and software design provides process control and monitoring, data gathering, data reporting, alarm alerting via SMS and email, alarm historian and more.

FEATURES & BENEFITS

- RS485 Field Connectivity
- 3G Frequency Bands with low power draw
- CDMA or GSM, LTE, Class 3
- FCC Part 15 Class B Compliant
- ATT and Verizon certified
- Simplify I/O management with innovative software
- Single or Multi-channel flow or level or any process monitoring
- Network compatible wtih LPWAN, cellular, point-to-point, and wired network
- Ships from factory pre-configured for customers application to ensure easy installation and setup
- 5 year warranty

ENCLOSURE OPTIONS

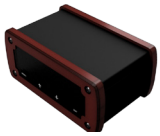
DIN RAIL MOUNT



STAND ALONE

NEMA 4X ENCLOSURE

OPTIONAL DISPLAY



SPECIFICATIONS

CONNEX 3D FLEXIBLE CELLULAR MODULE		
	CD3D-ATT	**CD3D-EV3**
Performance	HSPA	EV-DO rev A
Frequency Bands	3G: 850/900/1700 2G: 850/900/1800/1900	800/1900
TCP/IP	FTP, SMTP, TCP, UDP	
Power Draw	5VDC, 19mA sleep, 28mA idle, 397mA max.	5VDC; 22mA sleep, 34mA idle, 423mA max.
Input Power	3.3V - 5VDC	3.3V - 5 VDC
Operating Temperature	-35º to 185ºF	-40º to 185ºF
Storage Temperature	-40º to 185ºF	-40º to 185ºF
Humidity	20% to 90% RH, non - Condensing	
EMC Compliance	FCC Part 15 Class B, EN55022, EN55024	FCC Part 15 Class B
Radio Compliance	FCC PArt 22, FCC Part 24, RSS 132, RSS 133, EN 301 511, EN 301, 489-1, EN 301 489-7, EN 301 489-24	FCC Part 22, FCC Part 24
Network	PTCRB	N/A
Carrier	ATT, T-Mobile	Verizon, Sprint

Specifications are subject to change without notice.

NETWORK CAPABILITIES

Wired Networks: Higher capacity and speed, limitations to their mobility, and unlimited connectivity in both data rates and utilization at a cost per asset that is generally low.

Point-to-point Networks: Generally have no ongoing operational expenses, however their range is often limited.

Cellular Networks: Great for mobility, guaranteed quality of service, large bandwidth, and use higher amounts of power.

LPWANs Networks: Robust growth in technology, best for remotely deployed applications that require long-range or deep in-building communication between large number of devices with lower power consumption.

LoRaWAN CONNECTIVITY

CONNEX 3D™ offers carrier-approved LoRaWAN end-point connectivity for long range, low power wireless applications. The CONNEX 3D provides significantly longer range and improved radio performance compared to traditional wireless solutions - resulting in greater transmission range and flexibility in a wide range of applications.

- Up to 10 mile range
- Deep In-building penetration - 1 to 3 miles
- Wireless low power consumption - under 0.026 Amps
- LoRaWAN 1.0.1 compliant
- Mesh network replacement

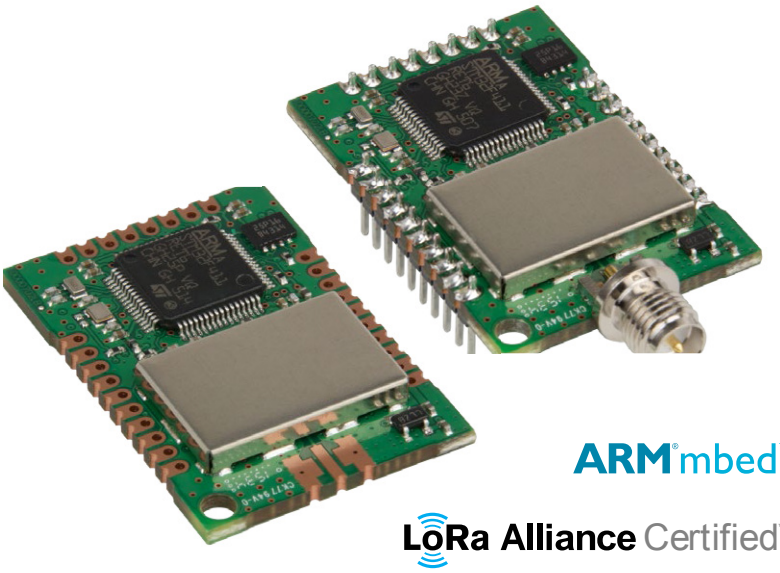
LoRaWAN SPECIFICATIONS

Model	MTDOT-868	MTDOT-915
Region	Europe	North America / Australia
Communication	LoRaWAN 1.0.1 compliant ARM mbed libraries or AT commands for radio control 868MHz and 900MHz	
Interfaces (pin functions are multiplexed)	Up to 21 Digital I/O, Up to 11 Analog Inputs, SPI, I2C, UART (RX, TX, RTS, CTS)	
Physical Dimensions	1.0" x 1.47" (25.5 X 37.3 mm)	
Radio Frequency		
Modulation	FSK, GFSK, MSK, GMSK, OOK, LoRa Digital Spread Spectrum	
Frequency	860-1020 MHz	
Performance*		
CPU	STM32F411RET	
Max Clock	100 MHz (configurable to power use)	
Flash Memory	512 KB (400 KB customer usable)	
RAM	128 KB	
Power		
Max Transmitter Power Output (TPO)	14 dBm	19 dBm
Max Receive Sensitivity	-137 dBm	-130 dBm
Link Budget*	151 dB Point-to-Multipoint, 147 dB Point-to-Point	145 dB Point-to-Multipoint, 147 dB Point-to-Point
* Calculation assumes two 0 dBi antennas. North America: Greaterlink budget possible with higher gain antennas. Europe: This is the maximum link budget. Note: Point-to-Multipoint utilizing MultiTech gateway with MT-LORA accessory card.		
Max Effective Isotropic Radiated Power (EiRP)	10 dBm	36 dBm
Input Voltage	3.3 - 5VDC ± 5%	
Environmental		
Operating Temperature	-30° C to +70° C (-22° F to 157° F)	
Storage Temperature	-40° to +85° C (-40° to 185° F)	
Relative Humidity	20 to 90% noncondensing	
Certifications		
EMC Compliance	US: FCC Part 15 Class B. EU: EN 55022 Class B, EN 55024. Canada: ICES-003	
Radio Compliance	FCC 15.247, IC RSS-210, EU EN 300 220	
Safety Compliance	UL/cUL 60950-1 2nd Ed., cUL 60950-1 2nd Ed., IEC 60950-1 2nd Ed., AS/NZS 60950.1	
Quality	MIL-STD-810G: High Temp, Low Temp, Random Vibration. SAE J1455: Transit Drop & Handling Drop, Random Vibration, Swept-Sine Vibration. IEC68-2-1: Cold Temp. IEC68-2-2: Dry Heat	

* Actual performance speeds may be affected by a variety of attributes such as distance from gateway, data loads, packet sizes, etc.

LoRaWAN POWER DRAW

Voltage	3.3V		5.0V	
Sleep Mode (Version 0.1.2 or newer)	40.0 µA			
Idle Current Average (Amps)	0.032			
Packet Size (Bytes)	10	53	10	53
Average Current (Amps) at Low Transmit Power Setting (TXP 2)	0.026		0.026	0.025
Average Current (Amps) at Default Transmit Power Setting (TXP 11)	0.028	0.029	0.028	
Average Current (Amps) at Maximum Transmit Power Setting (TXP 20)	0.031	0.041	0.032	0.042
Total Inrush Charge Measured in Millicoulombs (mC)	1.14		1.79	
Total Inrush Charge Duration during Powerup (InRush Duration)	661 µS		1.24mS	



ARM mbed

LoRa Alliance Certified

WEB PORTAL DATA

Remote Data Capture: Data is transferred from the memory of the CONNEX 3D cellular monitor to the cell tower and into a remote server (customer server or optional FLO-CORP server) for data files viewable on smart mobile devices or pc. Data records are viewable in .csv (example, EXCEL) files and manipulated for custom customer use. Using the FLO-CORP server option the user will be provided a unique user name and login password to the site. From this unique site the user can provide permissions and account creation for additional users like customers or co-workers. The web interface works in all browsers and doesn't require any downloads or plugins for full functionality. The unique "Rest API" supports all operations on uploaded files, users, groups, permissions, notifications (email and sms) and more. Our Webhook API alerts you when any event occurs.

Example of transferred data file: