- **PortableUSB Device**
- **OnBoardresources(200MHzprocessor,64Mbytes RAM,16Mbytes Flash, 256Mbytes NAND Flash)**
- **Availableinacombinationof2Tx/4RxChannels**
- **GPS Synchronization Capability (optional)**
- **8UserprogrammableDiscreteIOs**
- **Supportsuptomax12Channels**
  - **> 4TransmitChannels**
  - **> 8ReceiveChannels**
- **Configurable for High Speed/Low Speed**

- **128x32bitStaticRAMInterfaceoneachArinc429node**
- **Programmable interrupts ReceiveDatatime-stamping**
- **TransmitDataScheduling(Asynchronous/Synchronous) messages**
- **Two32x32TransmitFIFOoneachArinc429node**
- **GraphicalUserInterfaceSoftwareforBusAnalysisand Simulation**
- **SoftwareDriversupportWindowsXP,Windows7, Linux, RT Linux**

OVERVIEW

TheAT-USB-429moduleisasmall,portable,USBdevicethatprovidesaflexible,powerfulARINC429avionicsdatabusinterfacefor the development and maintenance of commercial avionics. The unit is designed to transmit and receive messages up to 12 channels. Each channel is software configurable for high or low speed (12.5k or 100k bits per second) andARINC429 protocol requirements.TheARINCdatawordcanbedecodedandsortedbasedontheLabelandSDIbitsandstoredinRAMand/orFIFOs.

Having extensive functionality, they are used to communicate with, simulate, test, and monitorARINC429 equipment and systems. The unit has onboard resources to compute time tags, handle data scheduling and offload the host fromARINC communication overheads.Theunitcomeswithpowerfulsoftwarethatreducesdevelopmenttime.Alldatabusfunctionalityissupportedfromour advancedAPI(ApplicationProgrammingInterface)andVIP(VirtualInstrumentPanel).

Hardware

TheAT-USB-429modulecanbeconfiguredupto2nodeswithARINC429controllersfromDDC,eachnodecontaining2Transmit and4Receivechannels,providingamaximumof12channels.Eachcontrollerhasa128x32bitstaticRAM,four32(wordsdeep)x 32 (bit) Receive FIFOs and two 32 (words deep) x 32 (bit) transmit FIFOs. Look-up tables loaded into RAM enable the modules receivecircuitrytofilterandsortincomingdatabylabelanddestinationbitaswellasprovidemultileveldataspecificinterruptsor hardwaretriggers.

ThereceivechannelsallowforthestorageofallselectedLabelswithstatusandtimetaginformation(optional)appendedtoeach word. The receivers allow for filtering and multi-storage modes of Data Words. The transmit channels operate via a transmit "instructionstack"whichallowsschedulingofdatatransmissionsandreducestheneedforhostcomputerintervention.Thediscrete channelscontaincontrolI/Oregistersthatarememorymappedandcanbeaccessedinrealtime.

Power

TheunitcontainsaDCpowerjackforconnectiontoanexternal+12Vpowersource.TheDCjackisdesignedtointerfacewithoff- the-shelfACadaptors.

Software

TheAT-USB-429softwareincludesDrivers&APIs.Theproductcomeswithapowerfulsetoflibraryfunctionstoaccesstheentire ARINC429functionality.Thedriversaredesignedinamodularfashionconsistingofcomponentfunctionsandapplicationfunctions. Theuser'stestprogramcanbedevelopedwithfewcallstothedriver,byusingthesetofApplicationfunctionsprovided.Driverand high-levelAPIlibrariesforWindowsXP,Windows7,Linux,RT-Linuxareavailable.Sampleapplicationsareincluded.

AT-USB-429

ARINC429 USB MODULE

PRODUCT SPECIFICATIONS

ARINC429 Interface

- Supports up to 12 ARINC429 channels
  - 4 Transmit Channels
  - 8 Receive Channels
- 128x32 bit Static RAM interface on each ARINC429 controller
- Programmable Interrupts
- Configurable Bit Format Control

Transmit Interface

- Programmable 12.5/100 KHz bit rate
- Two 32 (words deep) x32 (bit) Transmit FIFOs on each ARINC429 controller
- Major/Minor frame scheduling
- Independent data transmit by each channel
- Programmable data transmit rate for each channel
- Transmit FIFO Status Indicators
- Synchronous word transmission
- Programmable Interword gap

Receive Interface

- Four 32 (words deep) x32 (bit) Receive FIFOs on each ARINC429 controller
- Receive data rates can be programmed for channel 0 and 1 independent of channel 2 and 3 in each ARINC429 controller
- Reducing Receive Data Latency
- Label and Filtering & Sorting of data
- Storage of data
- Parity Error Checking & Reporting
- Receive FIFO status indicator
- Time tagging of received messages
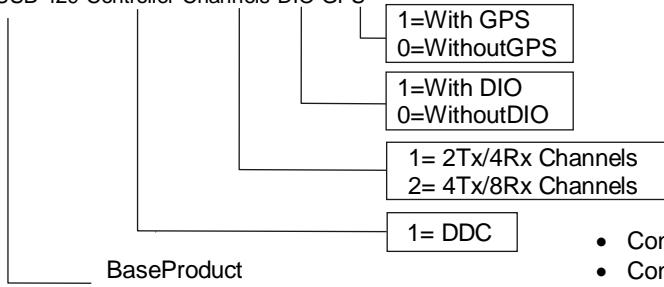
Diagnostics

- Power-up Self test with status reports
- Testing of Memory Elements
- Testing Transmit/Receive functions
- Interrupt Function Testing
- Wraparound Test for each channel

Error Conditions

- Sequence Error
- Address Error
- FIFO Overflow Error
- Receive Data Parity Error
- ARINC Clock Error

Discrete Channels

- 8 Discrete Inputs, TTL (0-5V)
- 8 Open Drain Discrete Outputs, TTL (0-5V), max current of 100mA

GPS Receiver (optional) for Synchronization

- GPS receiver on-board for Synchronization
- Synchronization control through software
- Synchronization of on-board time tag counters with GPS time
- 32 bit micro-second time tag counter synchronized with GPS
- Separate GPS antenna provided along with the unit

Software Support

- Driver and high-level API libraries for Windows XP, Windows 7, Linux, RT Linux

Physical

- Durable Enclosure with covers for 429 connectors
- Approximate dimensions (135mm x 155mm x 32mm)

Environmental

- Operating temperature: 0°C to +50°C
- Storage temperature: -20°C to +70°C
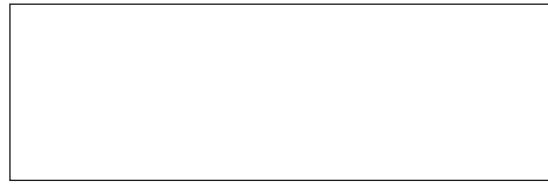
Power

- +12V External Powered through AC Adapter

Warranty

- 1 year limited warranty

ORDERING INFORMATION

Hardware Selection

AT-USB-429-Controller-Channels-DIO-GPS

- 1 = With GPS
- 0 = Without GPS

- 1 = With DIO
- 0 = Without DIO

- 1 = 2Tx/4Rx Channels
- 2 = 4Tx/8Rx Channels

- 1 = DDC

Base Product
AT-USB-429 = USB 429 DEVICE

- Contact sales for support for other Operating Systems
- Contact sales for configuration of front and rear I/O configuration
- Contact sales for environmental options

Distributor/Reseller

December 2023