



INTEGRATED DATA ACQUISITION (IDAQ)

GENERAL DESCRIPTION

The Integrated Data Acquisition System (IDAQ) is a compact, scalable, modular and integrated data acquisition system, which includes following components :

- Separate SLAVE modules for each analog input type
- MASTER module managing all slave modules
- BASE module which is a container chassis handling the inter-module communication and power distribution.
- RF Transmitter module with 10W Max Output Power

The system has different available versions for different number of slave modules (4-5-8), and it may be extended with other number of modules if requested. This makes the system fully scalable and flexible.

Each module is designed with the same compact form factor which can be inserted into the container chassis (BASE) of the system. The container chassis includes an internal power distribution circuit, which can be supplied by selectable two separate supplies. It also contains all the internal harness between modules.

PCM/FM (Tier 0), SOQPSK and BPSK type modulation waveforms are available for RF transmission . Data rate is configurable up to 20 Mbps with 0.1 kbps steps. Flexible architectures let systems be modified easily for higher data rates, different form factors and characteristics for specific applications.

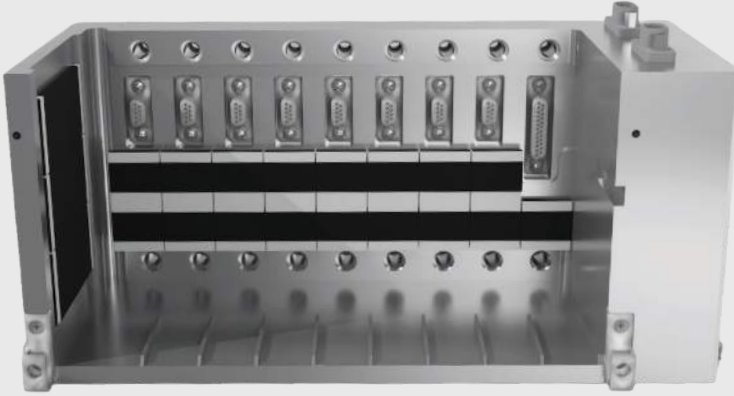
APPLICATION AREAS

- Fixed/Rotary Wing Aircraft Development
- Space Launch Vehicles
- Guided Munition Development and Tests
- Flight Test and Instrumentation
- Unmanned Autonomous System Test and Development

KEY SPECIFICATIONS

- Low SWaP (Size, Weight and Power)
- Data Acquisition and PCM Encoding
- Internal PCM Recording
- Power Efficient
- Ultra Compact Size
- Light Weight
- Various Output Power Options
- IRIG 106 Compatible
- MIL-STD-810 Compatible
- Support Data Encryption

INTEGRATED DATA ACQUISITION - BASE MODULE



Dimensions (mm)

IDAQ4: 129 x 89 x 85

IDAQ5: 143 x 89 x 85

IDAQ8: 187 x 89 x 85

Weight (g)

IDAQ4: 880

IDAQ5: 940

IDAQ8: 1140

Nominal Input Power

~1W

Input Voltage Range

12-36 V

Base module is the main chassis of the system, encapsulating whole system in a single rigid body. It contains all inter-module communication lines and power distribution lines. It provides a separate slot for each module, which enables the modules to be simply installable.

Main functions and features of the base module are:

- Provides isolated power to the system (Up to 150W)
- Can be supplied by two separate power supplies (Primary/Secondary)
- Can switch between two supplies
- Provides seamless communication between the modules.
- Provides a simple installation interface for the modules
- Provides a rigid body to enhance performance against environmental conditions
- Enhances thermal cooling performance of the system
- Provides 28V, 5V and 12V isolated power outputs for external systems

© 2026 TUALCOM: The information contained herein is subject to change without notice. TUALCOM cannot be held responsible for this and no liability is accepted for any errors or omissions.

 TUALCOM

 www.tualcom.com

 sales@tualcom.com

 +90 (312) 485 22 85

INTEGRATED DATA ACQUISITION - MASTER MODULE



Dimensions (mm)

75 x 60 x 13

Weight (g)

100

Nominal Input Power

~5W

Input Voltage Range

24-32 V

Base module is the main controller and PCM encoder unit of the system.

Functions and features of the Master module are:


- Manages up to 8 slave modules
 - Configures them according to the uploaded XML file
 - Checks which modules are installed in the system and initializes them
 - Gets sensor data from all slave modules
- Gets messages from external systems through digital interfaces (Ethernet & 6xRS-485)
- Reads Status of 8 discrete input channels
- Collects all sensor data, digital messages and discrete status in an IRIG-106 telemetry frame (PCM encoding)
- Can record telemetry frames into its 32 GB built-in memory
- Can send telemetry frames through ethernet in UDP or Chapter 10 format
- Can send telemetry frames through RS-485 as UART or PCM stream
- Can trigger runtime functions based on inputs, according to defined trigger conditions in the XML file.
- Can send supply switch command to the base module based on trigger conditions
- Can control status of 2 discrete outputs

© 2026 TUALCOM: The information contained herein is subject to change without notice. TUALCOM cannot be held responsible for this and no liability is accepted for any errors or omissions.

 TUALCOM

 www.tualcom.com

 sales@tualcom.com

 +90 (312) 485 22 85

INTEGRATED DATA ACQUISITION - SLAVE MODULES



Dimensions (mm)

75 x 60 x 13

Weight (g)

100

Nominal Input Power

~2W

Input Voltage Range

24-32 V

Slave modules are responsible for reading analog sensors, converting the analog sensor values to digital values and sharing them to the master module.

Module Name	Description	# of Channels	Available Versions	Version Specific Functional Differences
TUALIDAQ-ICP	Used with acceleration/vibration sensors requiring current excitation	16	S01	First order filter
			S02	Second order filter
TUALIDAQ-PRS	Used with strain/pressure sensors requiring voltage excitation	14	S01	* All channels are single-ended. * None has configurable gain. * Excitation voltage level is 12.5V * Measurement range is +-40V for all channels
			S02	* All channels are differential. * First 8 channels have configurable gain. * Excitation voltage level is 10 * Measurement range is +-2.5V for first 8 channels. +-40V for last 6 channels
TUALIDAQ-TMP	Used with temperature sensors (PT100, Thermocouple)	16	S01	N/A

© 2026 TUALCOM: The information contained herein is subject to change without notice. TUALCOM cannot be held responsible for this and no liability is accepted for any errors or omissions.

 TUALCOM

 www.tualcom.com

 sales@tualcom.com

 +90 (312) 485 22 85

INTEGRATED DATA ACQUISITION - TRANSMITTER MODULE



 **Dimensions (mm)**

75 x 60 x 21.5



Weight (g)

125



Nominal Input Power

~30W (@40dBm RF)



Input Voltage Range

24-32 V

TUALCOM aeronautical telemetry transmitters are ultra small flight test telemetry modules that are suitable for many aerospace applications, including missiles, rockets and UAV's. Transmitter module in IDAQ device family is configured by master module and operates as synchronised


- IRIG-106 compatible
- Offer data encryption, FEC and randomizer.
- PCM/FM (Tier 0), SOQPSK and BPSK type modulation waveforms are available.
- Data rate is configurable up to 20 Mbps with 0.1 kbps steps.
- Frequency Range is 2200-2400 MHz
- Maximum RF power output is 10 Watts.

© 2026 TUALCOM: The information contained herein is subject to change without notice. TUALCOM cannot be held responsible for this and no liability is accepted for any errors or omissions.

 TUALCOM

 www.tualcom.com

 sales@tualcom.com

 +90 (312) 485 22 85



140042602