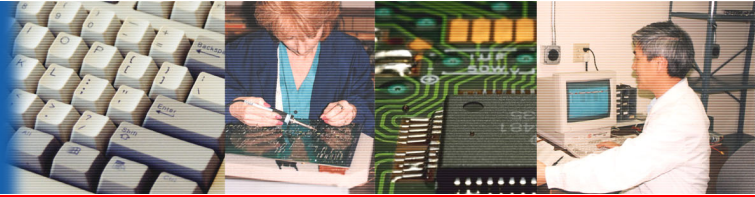
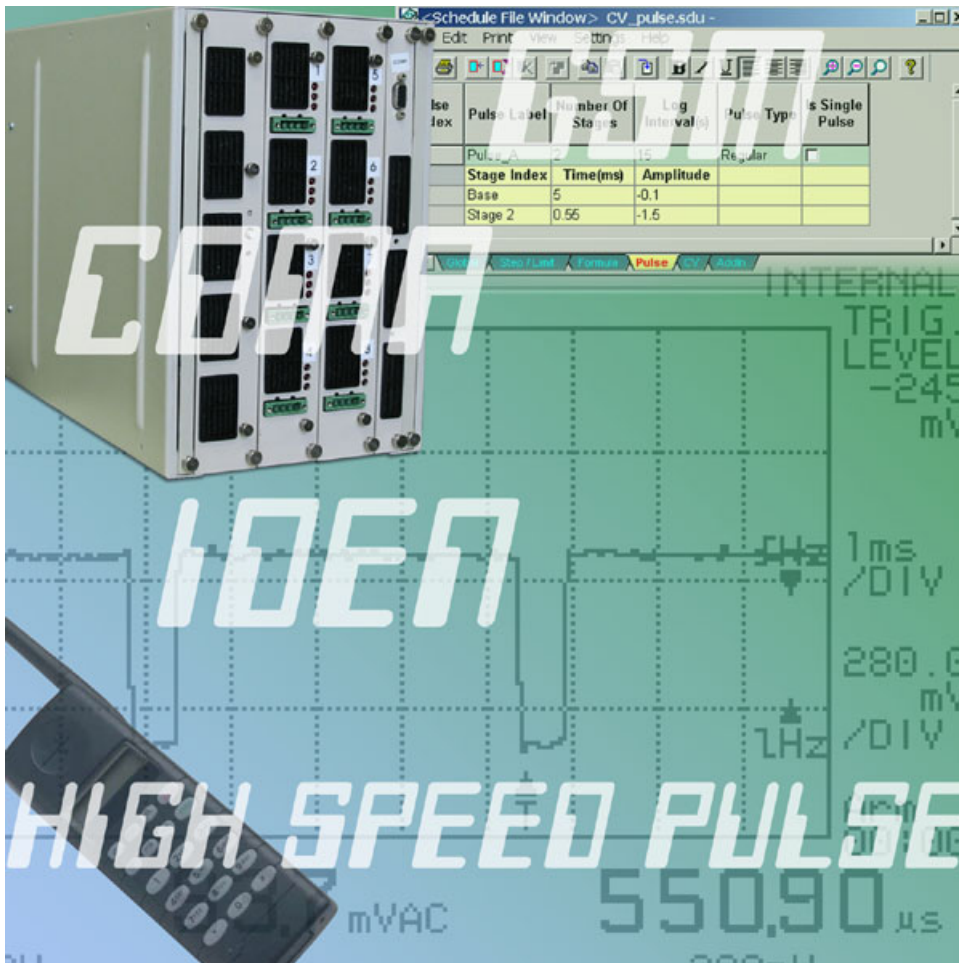


HSTS



High Speed Testing System



- GSM, CDMA, iDen, or other custom-defined pulse profile testing
- High speed pulse in micro-second range
- Simultaneous pulse generation and recording
- Up to three current ranges per channel
- Multiple, independent channels

Arbin's High Speed Testing System, **HSTS**, is designed to test batteries or super capacitors that are used in wireless communication applications. Its pulse function covers over a broad range of communication profiles from 500 microseconds of pulse stage-width up to 60 minutes of pulse width. Commonly used functions in energy storage device testing such as charge-discharge, constant current, constant voltage, constant load and constant power are independently conducted on each channel of HSTS. The system also features high reliability, facilitated maintenance, and a preventive safety net.



HSTS Features

- Maximum of 24 I, V channels in one system, each channel can have up to three current ranges. Independent control for each test channel.
- Programmable control of current, voltage, load and power; providing constant, linear ramp, staircase, and other control profiles, generated by a specified formula.
- 0.1% FSR control and reading accuracy on current and 0.05% FSR control and reading accuracy on voltage.
- Continuous or single pulse operation at fast current rise time — from 50 μ s to 2ms, depending upon current rate.
- Cover various pulse testing applications such as GSM, CDMA, iDEN, GPRS, etc. In addition to these standard pulse profiles, customer can define other pulses with number of stages between 2 and 10. Each stage width is from 500 μ s to 60 minutes.
- Pulse current and voltage are recorded simultaneously.
- Online measurement of DC internal resistance or optional AC impedance.
- External charger and auxiliary inputs, such as temperature, and/or voltage, are easily integrated into the module's function.
- Plug and play modular structure.



24 main I, V channels with external charger—each featuring a voltage range of 0 ~ 5V; $\pm 5A/100mA$ current ranges; 24 (10k Ω , 25°C) thermistor inputs with temperature range of -80°C ~ 150°C; 24 voltage inputs of 0 ~ 10V.



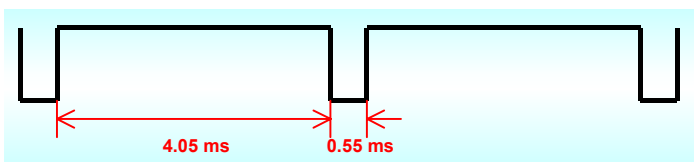
4 main I, V channels featuring voltage range of 0 ~ 10V; $\pm 5A/100mA/10mA$ current ranges.

Pulse Testing Profiles

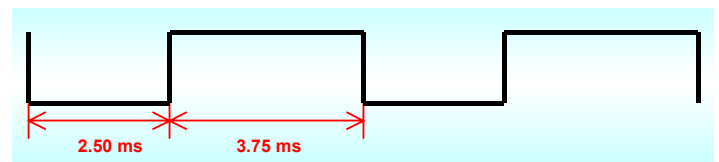
Fast Pulse Function

In fast pulse profile, stage widths are usually less than one second or at milliseconds/sub-millisecond duration. Representative of fast pulse profiles are GSM, CDMA, iDEN, and GPRS. User may select factory-setting GSM or CDMA profiles, or use user-defined selection to generate other profiles. An HSTS system contains several micro-controllers where each controls up to 8 test channels. Channels under one micro-controller have to be run with the same pulse profile. CDMA-talk and CDMA-standby can be treated as one type of profile.

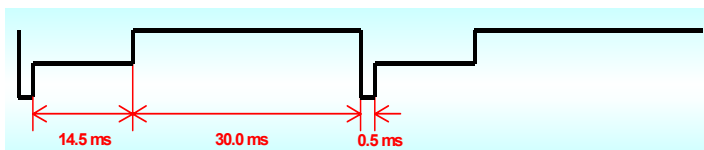
GSM (Global System for Mobile Communications)



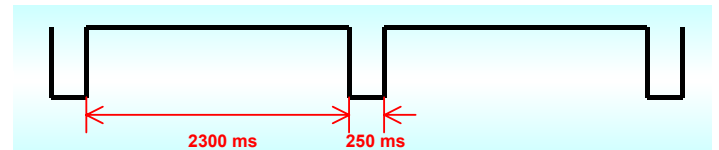
CDMA-talk (Code Division Multiple Access)



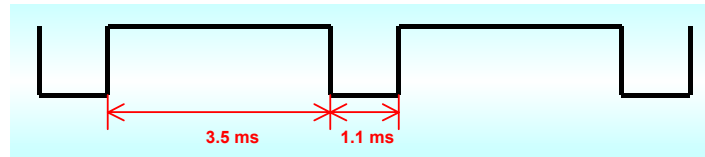
iDEN (Integrated Digital Enhanced Networks)



CDMA-standby



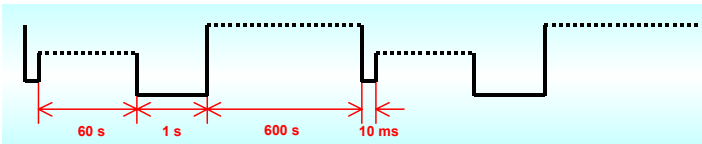
GPRS (General Packet Radio Service)



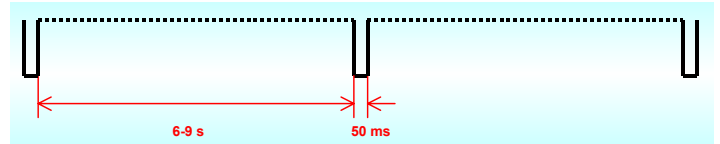
Slow Pulse Function

A slow pulse is defined as a pulse with greater than one second stage width. "User Defined Pulse" must be selected to run slow pulse with Arbin testing software. The same rule is applied on pulse profile sharing one micro-controller. Example of typical slow pulse profiles are those of space communication and radio transmission profiles.

Space Communication Profile



Radio Transmission Profile



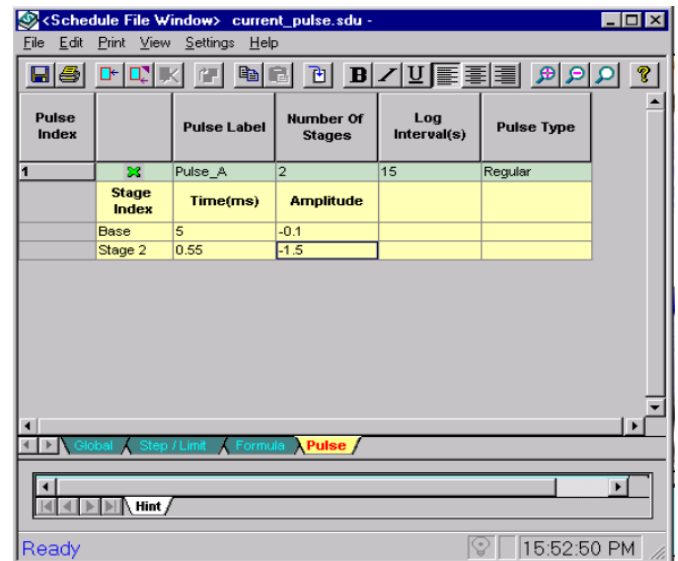
Single Pulse Function

A single pulse can be generated for certain unique application. In this case, a fast data login is required to catch voltage and/or current data during a transition at level of milliseconds.

Pulse Testing Software

All pulse parameters are user-configurable using MITS Pro graphical user interface. Test regimes can be configured that can use any desired combination or sequence of control modes, including **constant current**, **constant voltage**, **constant load**, **constant power**, **C-rate**, **current pulse**, and **voltage pulse**, within the limit of hardware specifications. The software provides total flexibility in establishing parameters for control, cut-off conditions, and data collection. Defining a pulse waveform can be easily accomplished by entering appropriate values in the designated fields.

In MITS Pro software version 2.8 or later, up to ten pulse-stages are allowed (counting the base stage). The minimum width is 500 μ s and the maximum width is 60 minutes for each stage. Stage increment width is 10 μ s.





Typical System Order

HSTS Model	HSTS-5V-2A-4Ch-8Tm-8AV	HSTS-5V-2A-4Ch-8Tm-8AV-ext	HSTS-5V-2A-24Ch-24Tm-24AV	HSTS-5V-2A-24Ch-24Tm-24AV-ext	HSTS-5V-5A-24Ch-24Tm-24AV	HSTS-5V-5A-24Ch-24Tm-24AV-ext	HSTS-5V-10A-24Ch-24Tm-24AV	HSTS-5V-10A-24Ch-24Tm-24AV-ext
Channel Control	Independent	Independent	Independent	Independent	Independent	Independent	Independent	Independent
Voltage Clamp	Shared for each 8 channels	Shared for each 8 channels	Shared for each 8 channels	Shared for each 8 channels	Shared for each 8 channels	Shared for each 8 channels	Shared for each 8 channels	Shared for each 8 channels
I/V Output Voltage	0 ~ 5V	0 ~ 5V	0 ~ 5V	0 ~ 5V	0 ~ 5V	0 ~ 5V	0 ~ 5V	0 ~ 5V
Accuracy of V control & Reading in Regular Step	± 5mV	± 5mV	± 5mV	± 5mV	± 5mV	± 5mV	± 5mV	± 5mV
Accuracy of V control & Reading in Pulse Step	± 50mV	± 50mV	± 50mV	± 50mV	± 50mV	± 50mV	± 50mV	± 50mV
Voltage Input Impedance	~ 10GΩ	~ 10GΩ	~ 10GΩ	~ 10GΩ	~ 10GΩ	~ 10GΩ	~ 10GΩ	~ 10GΩ
High Current Range	± 2A	± 2A	± 2A	± 2A	± 5A	± 5A	± 10A	± 10A
Medium Current Range	± 100 mA	± 100 mA	± 200 mA	± 100 mA	± 1 A	± 100 mA	± 1A	± 100 mA
Low Current Range	± 1 mA	None	± 10 mA	None	± 100 mA	None	± 100mA	None
Accuracy of I Control & Reading in Regular Step	± 4 mA(H); ± 0.2mA(M); ± 2 μA(L)	± 4 mA(H); ± 0.2mA(M)	± 4 mA(H); ± 0.4mA(M); ± 20 μA(L)	± 4 mA(H); ± 0.2mA(M)	± 10mA(H); ± 2mA(M); ± 0.2 mA(L)	± 10mA(H); ± 0.2 mA(M)	± 20mA(H); ± 2mA(M); ± 0.2mA(L)	± 20mA(H); ± 0.2mA(M)
Accuracy of I Control & Reading in Pulse Step	± 20 mA(H); ± 1 mA(M); ± 10 μA(L)	± 20 mA(H); ± 1 mA(M)	± 20 mA(H); ± 2 mA(M); ± 100 μA(L)	± 20 mA(H); ± 1 mA(M)	± 50 mA(H); ± 10 mA(M); ± 1 mA(L)	± 50 mA(H); ± 1 mA(M)	± 100 mA(H); ± 10 mA(M); ± 1 mA(L)	± 100 mA(H); ± 1 mA(M)
Current Rising Time	~ 50μs	~ 50μs	~ 50μs	~ 50μs	~ 50μs	~ 50μs	~ 50μs	~ 50μs
Auxiliary Input	8 aux. thermistor (10kΩ), 8 aux. voltage	8 aux. thermistor (10kΩ), 8 aux. voltage	24 aux. thermistor (10kΩ) 24 aux. voltage	24 aux. thermistor (10kΩ), 24 aux. voltage	24 aux. thermistor (10kΩ), 24 aux. voltage	24 aux. thermistor (10kΩ), 24 aux. voltage	24 aux. thermistor (10kΩ), 24 aux. voltage	24 aux. thermistor (10kΩ), 24 aux. voltage
External Charger	None	4 ext. chargers, one for each channel	None	24 ext. chargers, one for each channel	None	4 ext. chargers, one for each channel	None	4 ext. chargers, one for each channel