

SV4E-I3C

I3C Test and Debug Module



Versatile Tool for Exercising, Analyzing, and Programming Sensor Interfaces

The SV4E-I3C is an all-inclusive solution for I3C-based sensor interface development, test, and programming. Containing three instruments in one, this tool can act as a **protocol exerciser** for testing and debugging I3C slave or master devices. It can also act as a complete **protocol analyzer** with fine-resolution timing analysis and a full suite of conformance test capability. Finally, it contains a deep vector memory, which allows it to be used as a general purpose I3C **device programmer**. All three categories of instrumentation features are accessible simultaneously and in real-time using the award winning Introspect ESP Software.

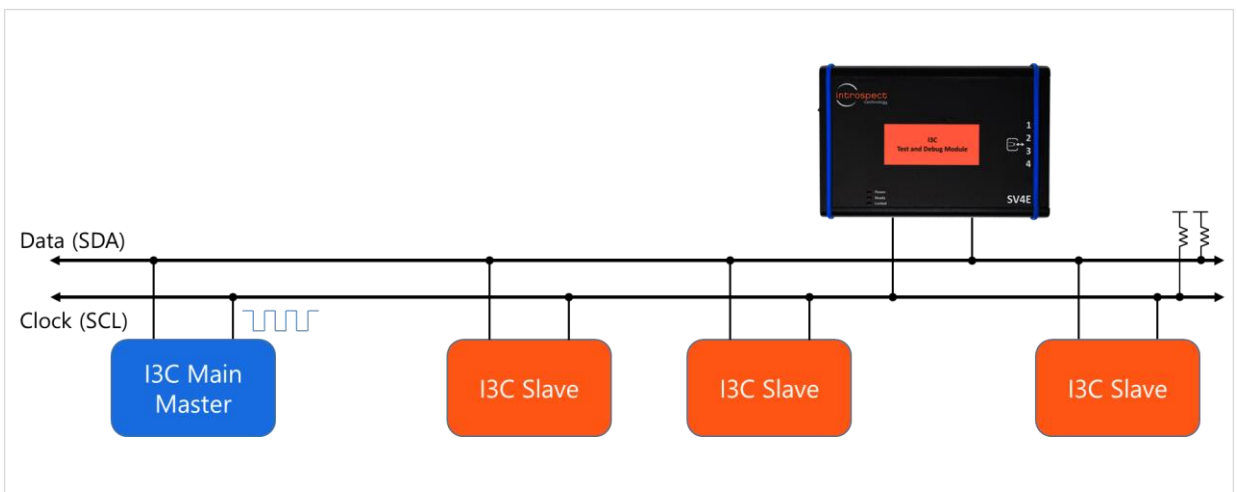
KEY FEATURES:

- **Device roles:** able to configure multiple devices with different roles (main master, secondary master, slave) concurrently
- **Device instances:** integrates 4 parallel devices, each with its own independent protocol stack
- **Timing resolution:** 5 ns resolution on delay generation (exerciser) and time-stamp (analyzer) logic
- **Protocol analysis:** easily trigger on CCC's and patterns for private and device to device communication, IBI, and hot-join

KEY BENEFITS:

- **Complete debugging:** simultaneous protocol exercising and analysis enables complete debugging of individual sensor/controller devices or entire multi-device systems
- **Flexible:** solution featuring I3C and I3C Basic protocol support with real-time voltage and timing controls
- **Automated:** scripting capability ideal for debug tasks, verification and full-fledged production screening of devices and system boards

Typical Application: Probing Live Buses



General Specifications

Feature	Description	Benefit
Protocol	I3C + I3C Basic	Flexible software allows for closely tracking the rapid MIPI Alliance protocol evolution
Number of Instances	4	Emulates the most complex multi-sensor operating paradigms
Maximum Data Rate	33 Mbps	Provides a future-proof investment for next generation device data rates
On-Board Memory	1 Gbyte total	Can act as a device programmer

Electrical Specifications

Feature	Description	Benefit
Voltage Levels	Programmable up to 5 V	Supports a wide array of devices under test
Push/Pull Drivers	Supported	Enables maximum-speed operation with the most advanced I3C devices
Open-Drain Drivers	Supported	Interoperates with legacy I2C devices
Per Wire Skew Injection Resolution	5 ns	Enables executing characterization sweeps

Detailed Analysis Capability

Capture summary 310 PHY States, 24 I3C States, 2 Messages

ID	Time (ns)	Description	Param	PHY States	Duration (ns)	Message
0	0.000	DELPHI_BUS_IDLE	(b=0)	(S0, ID)	0.825	
1	2.825	HU_ADDR	(b=0)	(S0, ID)	2.000	
2	2.825	HU_ADDR_ACK	(b=0)	(S0, ID)	0.250	
3	6.075	SDR_BCAST_I3C_WR	(b=0)	(S0, ID)	3.225	
4	6.295	SDR_BCAST_I3C_WR	(b=PC)	(S0, ID)	2.000	
5	7.295	SDR_BCAST_I3C_ACK	(b=0)	(S0, ID)	2.000	
6	10.545	SDR_BCAST_I3C_WR	(b=0)	(S0, ID)	2.000	
7	10.545	SDR_BCAST_I3C_WR	(b=0)	(S0, ID)	0.250	
8	10.795	DAA_SIR	(b=0)	(S0, ID)	1.725	
9	12.520	DAA_I3C_BCAST_RD	(b=0)	(S0, ID)	2.000	
10	14.520	DAA_I3C_BCAST_ACK	(b=0)	(S0, ID)	0.250	
11	14.770	DAA_SLV_INFO_B0	(b=AA)	(S1, S1A, S0)	2.000	
12	16.770	DAA_SLV_INFO_B1	(b=AA)	(S1, S1B, S0)	2.000	
13	18.770	DAA_SLV_INFO_B2	(b=CA)	(S0, S0)	2.000	
14	20.770	DAA_SLV_INFO_B3	(b=FE)	(S1, S1B, S1)	2.000	
15	22.770	DAA_SLV_INFO_B4	(b=BA)	(S0, S0)	2.000	
16	24.770	DAA_SLV_INFO_B5	(b=BE)	(S0, S0)	2.000	
17	26.770	DAA_SLV_INFO_B6	(b=DA)	(S1, S0)	2.000	
18	28.770	DAA_SLV_INFO_B7	(b=BE)	(S1, S0)	2.000	
19	30.770	DAA_BADDR	(b=10)	(S1, S1B, S1)	2.000	

Powerful search

Precision time stamps

Human-readable event lists

Hyperlinks to toggle from protocol layer to physical layer view

Dynamically adjust timing diagram span based on selected events