

# UxV/35 Pin Assignments



The signals assigned to the UxV/35 pins are based upon commonly used signals in the unscrewed systems ecosystem.

The UxV/35 signal groupings are aligned to the corner connectors in the physical placement of the Samtec 2mm 3 x 3.

Group A are the 1-2ms servo signals for up to eight individual axis of control. Included in this group is the SBUS signal for streaming control of those servo signals from an outside radio source.

Group B are bus based communications signals such as I2C, CAN, CVBS video and general or multi-purpose signals

Group C are supply voltage signaling such as +5v, +3.3v and Battery + inputs as well as an analog representation of system power usage. System control signals such as Reset, Return-To-Home and Pause complete the system control and provide for designed in safety signaling.

Group D are discrete point to point serial communications assigned various boards as they are plugged into the stack. Since many of these serial signals are for proprioception sensors, they can be “snooped” upon since they are presented to each layer.

A1	A2	A3
A4	A5	A6
A7	A8	A9

B1	B2	B3
B4	B5	B6
B7	B8	B9

C1	C2	C3
C4	C5	C6
C7	C8	C9

D1	D2	D3
D4		D6
D7	D8	D9

- A1 – Servo1
- A2 – Servo2
- A3 – Servo3
- A4 – Servo4
- A5 – Servo5
- A6 – Servo6
- A7 – Servo7
- A8 – Servo8
- A9 – SBUS

- B1 – SCL
- B2 – SDA
- B3 – SCL2
- B4 – SDA2
- B5 – GP1
- B6 – GP2
- B7 – GP3
- B8 – GP4
- B9 – GP5

- C1 – Batt+
- C2 – Batt GND
- C3 – RSSI
- C4 – Ain (Curr)
- C5 – RTH
- C6 – 3.3v
- C7 – Reset
- C8 – Pause
- C9 – +5V

- D1 – Tx A (FC->)
- D2 – Rx A (>FC)
- D3 – Tx B
- D4 – Rx B
- D5 – Key
- D6 – Tx C
- D7 – Rx C
- D8 – Tx D
- D9 – Rx D

## UxV/35 Pin Descriptions

S1-S8            These 8 signals or axis control are common RC servo signals that vary from 1000us to 2000us. The width of the pulse between the min and max is the ratio of control for the desired axis. A signal of 1500us would be considered 50%. The pulses are repeated a 40khz rate. Absence of the pulse train would be considered a fault or no signal.

# UxV/35 Pin Assignments



SBUS/RxE	SBUS is an industry standard created by Furaba. It's designed for a single receiver to transmit out control data over a single wire at a baud rate of 100kbps. Frames are 25 Bytes long and contain 16 11-bit channels in addition to 2 binary channels plus some status flags. 8 of these channels are directly addressed by the UxV/35 bus. It is inverted from the normal RS232 NRZ signaling, but most UARTS can easily transmit and receive SBUS even at the non-standard baud rate of 100K Baud. This is also the serial receive of a serial UART.
SCLA/SDAA	This is a common I2C signal bus. It can either be 3.3v or 5, It is the first of two independent channels. 127 devices can be addressed by the I2C bus including barometers, INUs and compass sensors. This is used commonly by the mission controller.
SCLB/SDAB	This is the second I2C channel that is primarily used for system expansion. Digital I/Os more servo channels, etc.
GP1/VideoIn	This is a general purpose line for systems usage or is assigned to a CVBS 1vpp signal to the mission controller. The mission controller may modify the video controller with a system relevant text or graphic overlays.
GP2/VideoOut	This is the post processed CVBS video signal with overlays and/or encryption that is available for consumption by other UxV/35 boards including a video transmitter board.
GP3/TxF/CanH	A multipurpose signal for usage as either a system specific I/O signal, a 6 <sup>th</sup> serial channel Tx signal or the high side of a CAN bus.
GP4/RxF/CanL	A multipurpose signal for usage as either a system specific I/O signal, a 6 <sup>th</sup> serial channel Rx signal or the low side of a CAN bus.
GP5/TxE	A multipurpose signal for usage as either a system specific I/O signal or as the transmit of the 5 <sup>th</sup> system serial port.
GND	In most cases this is the negative side of the system battery or power supply. It is also the return reference for all UxV/35 bus power and signaling.
+5vdc	This power signal is the primary UxV/35 bus power that is locally regulated on a UxV/35 board to locally desired voltages such as 3.3v, 1.8v and 1.2v. 1.5amps are commonly available
+3.3vdc	While 3.3v is generally derived on each UxV/35 board from the 5vdc using low dropout regulators or a switching power supply. It is available on the bus for higher powered 3.3vdc applications. 1.5 amps are commonly available.
Vin	This is the voltage directly from the system battery. It is unregulated and represents the actual voltage capacity available for the UxV system. It may be current limited with a self-healing fuses.

# UxV/35 Pin Assignments



Ain	A representative voltage that is proportional to the realtime current being utilized by the system is present on this pin. It ranges from 0-3.3vdc based upon system and I calibrated by the UxV/35 board that consumes this signal.
NRESET	This active low signal, ground to reset, is used to reset various UxV/35 boards and used to perform an radio channel binding that is necessary.
RTH	An active high signal, 3-5vdc, that requests the UxV/35 stack to return to a previous designated location.
PAUSE	An active high signal, 3-5vdc that requests that all UxV/35 movement is stopped. For non-UGVs this is used to hold position.
TxA-TxD	These are four NRZ 3.3vdc serial transmission signals. They may range in baud rates up to 230K Baud. They are connected to the UARTs of the Mission Controller but may be "snooped" upon by other UxV/35 boards in the stack such as MavLink commands or GPS signals.
RxA-RxD	These are four NRZ 3.3vdc serial receiver signals. They may range in baud rates up to 230K Baud. They are connected to the UARTs of the Mission Controller but may be "snooped" upon by other UxV/35 boards in the stack such as MavLink commands or GPS signals.