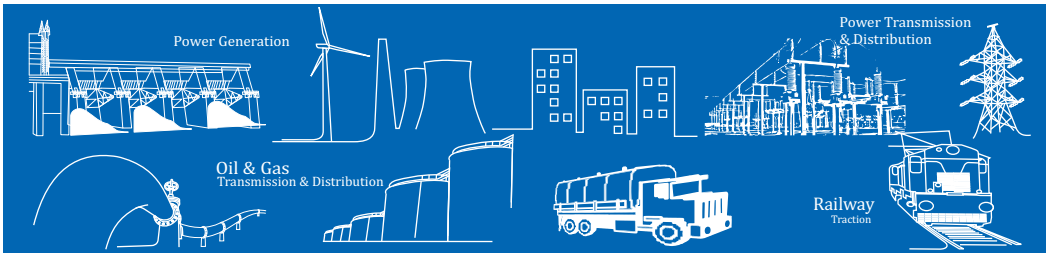
HUSKY™ SBRTU



HUSKY SBRTU is a high-performance single board RTU powered by a fan-less ARM microprocessor. The RTU provides communication interfaces as well as process I/O in a compact form factor. The RTU can be equipped with 2 nos. of Ethernet ports and 2 nos. of RS232/RS485 serial ports and various process I/O options (DI, DO, AI, AO & RTD) are available. Additionally, 3G/4G and Wi-Fi wireless interfaces are also supported as an option.

GENERAL TECHNICAL DESCRIPTION

The core of the RTU is an embedded, low-power ARM microprocessor providing all the computing power required for the RTU operations.

128MB of NAND flash is used for storage of configuration and other information. Additionally, a battery backed RAM is provided for storage of events and RTC time in the CPU.

ETHERNET COMMUNICATIONS

The RTU can be equipped with up to 2 nos. of 10/100 Ethernet ports.

The Ethernet ports have independent MAC addresses and can be used to communicate with IEDs, master stations, GPS receivers, etc. RTU diagnostics and configuration can also be performed via any of the ports. Multiple protocols can be simultaneously used on a single port.

SERIAL COMMUNICATION

The RTU has two serial ports that are software selectable between RS232 and RS485. All ports on the CPU are surge protected and isolated. In case of RS485, up to 32 devices can be multi-dropped on a single port.

TIME SYNCHRONIZATION

The RTU can be time synchronized by means of time synchronization protocols like SNTP, NMEA 0183 (serial) or via master station. Multiple time sources can be configured for backup. A battery backed RTC maintains the time with resolution of 1ms. RTC is synchronized automatically when time is received from any of the configured time sources.

WIRELESS COMMUNICATION

The RTU has option for wireless modem interface for communicating over radio networks. Different radio technologies can be used based on the chosen modem. Currently, 2G/3G/4G networks are supported. The use of the modem does not consume any of the serial ports available to the user. Certain models have option for dual SIM interface for providing redundancy of network provider.

Additionally, an optional Wi-Fi interface can be provided, which makes the RTU function as a Wi-Fi hotspot or Wi-Fi station. The Wi-Fi- hotspot feature allows laptops/tablets to connect to the RTU over Wi-Fi for diagnostics and configuration purposes.

INPUT/OUTPUT OPTIONS

The RTU has in-built I/O suitable for applications with low I/O requirements. The I/O options are built into the same board as the processor. All I/O terminations are via pluggable terminal blocks.

DIGITAL INPUT BLOCK

The digital input channels are positive logic binary, isolated inputs. Input scanning is executed at high resolution of 500 microseconds with a time stamp accuracy of 1 millisecond for Sequence of Event (SoE) recording. Following additional functions are provided:

- Configurable Single / Double Channel input
- 32 bit Pulse Counters with max frequency of 1KHz
- Configurable BCD with minimum 4 channels in a single digit
- Chatter filter or Anti-chatter
- De-bounce filter, configurable per channel
- Intermediate position (Transient state) suppression for monitoring of double bit inputs

8 inputs form a single group with common return. Each input channel is protected from surges. Each channel is galvanically isolated by means of opto-coupler.

DIGITAL OUTPUT BLOCK

The digital output block provides isolated relay outputs suitable for driving loads up to 7A @ 24VDC. Following functions are provided:

- Single / Double Channel Output
- Select-Before Execute (SBE) or Direct Outputs
- Pulsed or Latched direct output
- Double bit commands with automatic handling for latch outputs. Ensures that only one channel is triggered ON or OFF at any given time.
- Dedicated feedback monitoring for SBE commands via dedicated select and execute monitoring circuit. Detects hardware malfunctions and reports them to CPU

All output channels are protected against surge.

ANALOG OUTPUT BLOCK

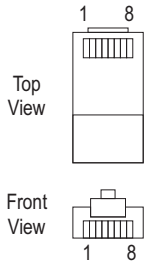
Analog Output block provides high performance isolated outputs, for 2 process signals. With a 16 bit DAC (15 bit data and 1 sign bit), it provides accuracy of 0.1%. Following additional functionalities are provided:

- 2 Channel Output
- Selectable for Current and Voltage Inputs
- Live Zero Output

The channels are individually isolated and protected against surge. Field and logic system are isolated using optical isolators to ensure maximum protection from field.

RS232 PIN DESIGNATION

Pin	Signal Name
4	GND
5	RX
6	TX
7	CTS
8	RTS



RS485 PIN DESIGNATION

Pin	Signal Name
1	(+)
2	(–)

POWER CONNECTION

Pin	Signal Name
1	DC +ve
2	DC -ve
3	EARTH

ANALOG INPUT BLOCK

The analog input block supports differential ended, unipolar and bipolar inputs. The inputs are galvanically isolated from system logic. With a 16 bit ADC (15 bit data and 1 sign bit), it provides an accuracy of 0.1% of full-scale.

- Built-in 50/60 Hz rejection filter
- Live Zero Monitoring
- Overload capacity of 150% of FSR

All input channels are protected against high voltage using suitable MOVs and fuses.

Voltage and current selection is achieved through jumpers provided for each channel. The block also monitors the open circuits in case of 4-20mA range and reports the faults to the CPU via diagnostic data. Open circuit channels are reported as Invalid.

Out-of-range inputs are detected and flagged as invalid by the block.

Optionally, the RTU also supports 2 channels of 2-wire RTD input, or 1 channel of 3-wire/4-wire RTD input.

SWITCH SETTINGS

Jumper	Purpose	Setting
SW1	Safe mode boot	1 2 Boot with default factory settings 1 2 Boot in normal mode
SW2	RTC Battery	1 2 Battery ON 1 2 Battery OFF

JUMPER SETTINGS

Jumper	Purpose	Setting
J14	COM1 RS485 Termination Resistor	1 2 120 Ω termination
J16	COM2 RS485 Termination Resistor	1 2 120 Ω termination

ORDERING INFORMATION

0		1	2		3	4		5		6		7
SBRTU	-	X	XX	-	XX	X	-	XXX	-	XX	-	XX

Field	Ordering Info	Code
1	Base Model (400MHz)	B
	Enhanced Model (528MHz)	E
2	One RS232/RS485 Serial Ports	01
	Two RS232/RS485 Serial Ports	02
3	1-port 10/100 Ethernet	01
	2-port 10/100 Ethernet	02
4	12VDC Input Power	L
	24VDC Input Power	M
	48VDC Input Power	H
5	***IO Options***	
	8DI / 6DO / 4AI / 2AO / RTD	A00
	8DI / 6DO / 4AI / 2AO	A01
	8DI / 6DO / 4AI	A02
	8DI / 6DO	A03
	8DI	A04
6	***Modem Options***	
	Wireless modem 4G	4G
7	***Optional Features***	
	None	00
	Wi-Fi Interface	WI

TECHNICAL SPECIFICATIONS

Processor	Cortex-M7 ARM Microprocessor
Speed	400MHz / 528MHz
RAM	32 MB / 64MB
NVRAM	128kB
Flash	128 MB NAND Flash
Serial	Up to 2 serial ports RS232 / RS485 software selectable Bit Rate <= 115200 Surge protected Isolation = 3 KV
Ethernet	Up to 2 ports 10/100 MBPS with Auto MDI-X Surge protected Isolation = 1KV

Ethernet Interface	RJ 45 (for 10/100 Ethernet)
Serial Interface	RJ 45
Power	20W
Input Voltage	12 / 24 / 48 VDC options available
Isolation	1.5KV isolated
Protection	Short Circuit Reverse Polarity
Operating Temp.	-5~+70°C
Relative Humidity	95% Non-condensing

DIGITAL INPUT BLOCK

Points	8 channels
Pulse Counter	8 channels. 1KHz maximum
BCD	Minimum 4 channels per BCD digit.
Isolation	3.7KV DC
Isolation between groups	500VDC
Protection	Surge & Overload
Input Filter	Settable from 1-255 msec in configuration
Chatter Filter	Yes

Nominal Input Voltage	110VDC	48VDC	24VDC
On Input Range	80-120VDC	38-50VDC	15-30VDC
Off Input Range	0-56VDC	0-24 VDC	0-12VDC
Input Current (per channel)	< 3mA	< 2mA	< 1mA

ANALOG INPUT BLOCK

Channels	4 Differential Input Channels Individually selectable for voltage and current.		
Voltage Inputs	0-10V DC	0-5V DC	
	± 10V DC	± 5V DC	
Current Inputs	0-20mA	4-20mA	±20mA
	Install the channel jumper to enable current mode.		
Input Counts	Unipolar: 0 – 32767	Bipolar: -32768 - +32767	
Resolution	16 bit (15 bit data + 1 sign bit) both for inputs		
Accuracy	0.1%		
Input Impedance	Voltage Inputs: 1 MOhm nominal Current Inputs: 250 Ohm nominal		
Isolation	Field & System	1500VDC	
	Between Channels	500VDC	
Protection	Surge & Overload		

DIGITAL OUTPUT BLOCK

Points	6 channels, 1 NO contact per channel
Contact Rating	24VDC @ 7A
Isolation	1.5KV between field and system
Protection	Surge

ANALOG OUTPUT BLOCK

Points	2 Channels, Each point individually selectable for voltage and current	
Accuracy	0.1% or better	
Isolation	Field & System	1500VDC
	Between Channels	500VDC
Protection	Surge & Overload	

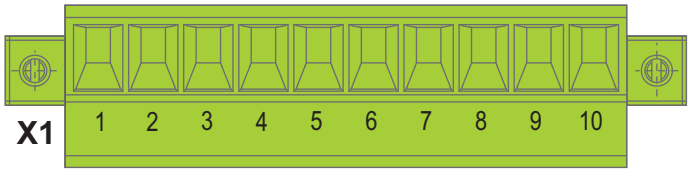
RTD BLOCK

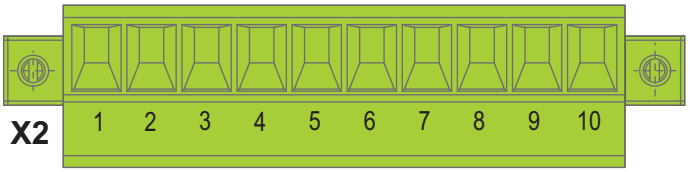
Channels	2Wire / 3Wire / 4 Wire
RTD Type	PT50 / PT100 / PT200 / PT500 / PT1000
Accuracy	0.1%
Protection	Mis-wiring & Surge Protected
Filter	Input Fault Current Filter

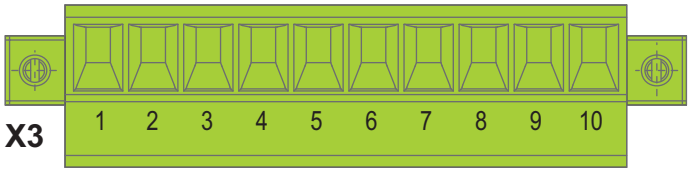
MECHANICAL

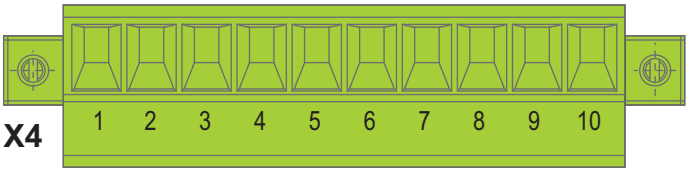
Mounting	DIN Rail
Dimensions	(H) 50mm x (W) 220mm x (D) 160mm
Weight	1 kg

TERMINAL DETAILS FOR SBRTU









TERMINAL	SIGNAL
X1-1	DI1 (+)
X1-2	DI2 (+)
X1-3	DI3 (+)
X1-4	DI4 (+)
X1-5	DI5 (+)
X-6	DI6 (+)
X1-7	DI7 (+)
X1-8	DI8 (+)
X1-9	Return (-)
X1-10	Earth

TERMINAL	SIGNAL
X2-1	DO1
X2-2	DO2
X2-3	DO3
X2-4	DO4
X2-5	DO5
X2-6	DO6
X2-7	
X2-8	
X2-9	COM
X2-10	

TERMINAL	SIGNAL
X3-1	AI1 (+)
X3-2	AI1 (-)
X3-3	AI2 (+)
X3-4	AI2 (-)
X3-5	AI3 (+)
X3-6	AI3 (-)
X3-7	AI4 (+)
X3-8	AI4 (-)
X3-9	RTD REF+
X3-10	RTD REF–

TERMINAL	SIGNAL
X4-1	RTD1-IN
X4-2	RTD2-IN
X4-3	RTD3-IN
X4-4	RTD4-IN
X4-5	AO1(+)
X4-6	AO1(-)
X4-7	AO2(+)
X4-8	AO2(-)
X4-9	AODC+
X4-10	AODC–