SHARC
Simple Hardware Adapter for Remote Communication

DATA SHEET

Rev. 08/10/2023

DESCRIPTION

The SHARC is a universal sensor adapter that simplifies industrial sensor connectivity and data acquisition.

The SHARC powers and measures signals from the connected sensor and publishes the data to an MQTT broker.

FEATURES

- Device and sensor powered by Power over Ethernet (PoE)
- Compact size (98mm x 36mm x 26mm)
- 1 channel of configurable inputs/outputs
- Analog 0-10V input
- Analog 4-20mA input
- Discrete NPN input
- Discrete PNP input
- Sensor loss detection
- Software-configurable input purpose, scaling, and calibration
- 100 Mbit Ethernet
- Built-in Wi-Fi
- Low Energy Bluetooth (BLE)
- Configurable over Bluetooth or MQTT
- User-defined data exchange over MQTT
- Over-the-air updates

APPLICATIONS

The SHARC was designed for sensor monitoring and process automation purposes.

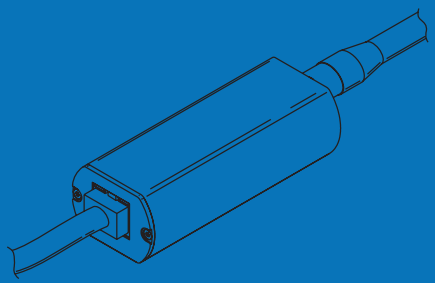
For example, it may be used to capture part counts on manufacturing lines. The SHARC can be used as a standalone device for acquiring sensor data or in parallel with existing architectures. MQTT's lightweight protocol and publish/subscribe model accommodates reliable message delivery, making integration between systems seamless and scalable.

There are countless machines and processes in the industry that have no data collection interface. In these situations, additive sensors are placed at different data collection points and integrated into the machine's controller or other hardware infrastructure. Typically, this process is long, involved, and includes numerous proprietary technologies.

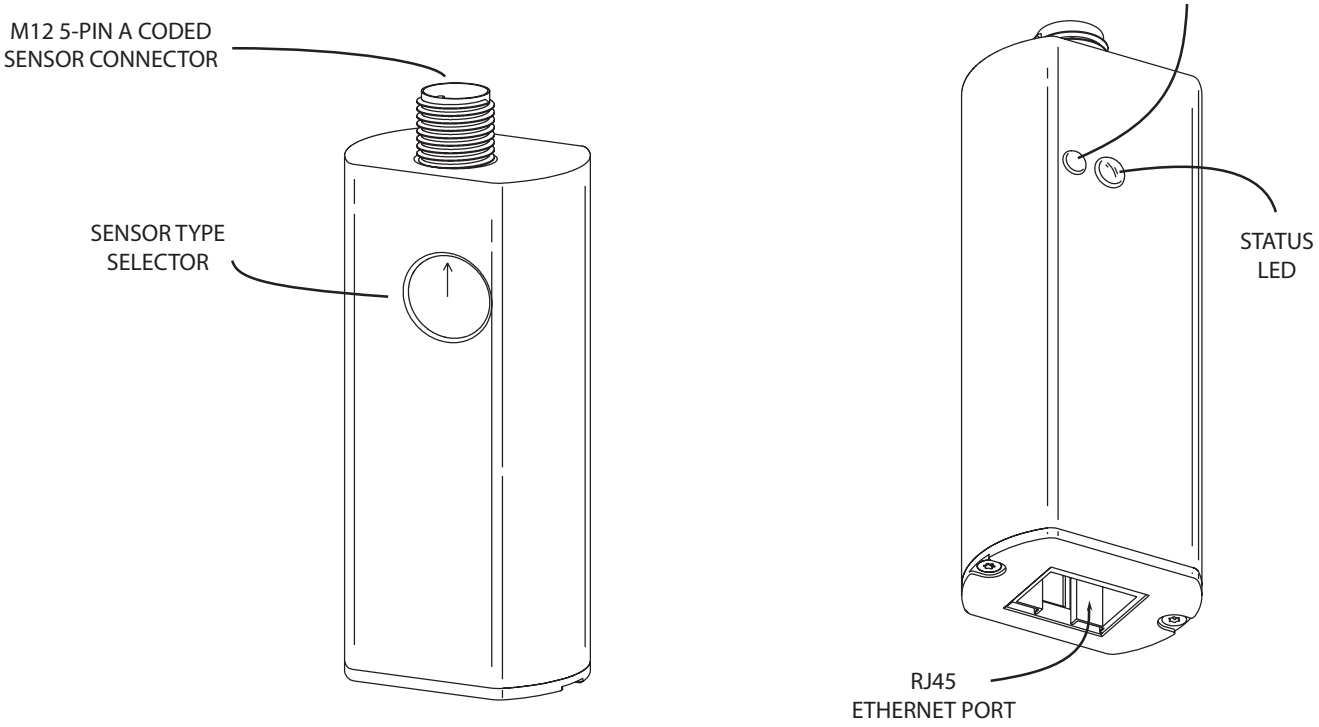
The SHARC is Simple!

1. Run a network line to the SHARC.
2. Plug any industrial sensor into the SHARC.
3. Point the SHARC at your MQTT broker.
4. Start consuming your sensor data.

Data can be sent to a database, dashboard, another device or application where actionable measurements can be derived and acted upon.



PHYSICAL CHARACTERISTICS



Status LED Indication	
YELLOW	Powering up
SOLID RED	MQTT Operation, Disconnnected
SOLID GREEN	MQTT Operation, Connected
SOLID CYAN	BLE Operation, Disconnected
SOLID BLUE	BLE Operation, Connected

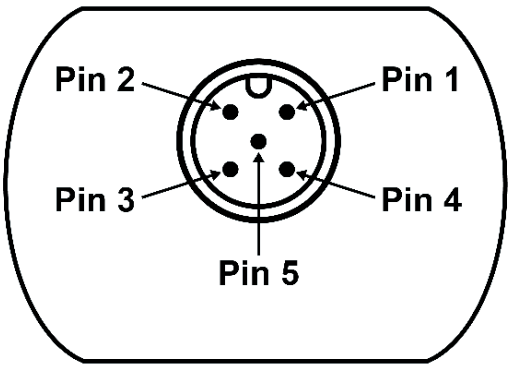
Ethernet LED Indication	
SOLID ORANGE	Link
BLINKING ORANGE	Link and Activity
SOLID GREEN	100Mbit Operation

MQTT / BLE Toggle Button

Hold down button until device reboots in order to switch between communication type.

Visit https://sharc.tech to configure your SHARC

M12 CONNECTOR PINOUT



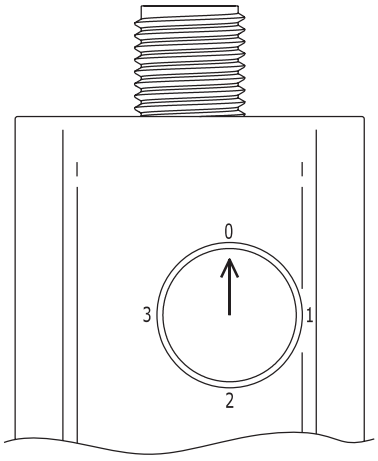
PIN	FUNCTION
Pin 1	24VDC Sensor Supply
Pin 2	Unused
Pin 3	0V (Ground)
Pin 4	Signal Input
Pin 5	Unused

SELECTION OF SENSOR TYPE

Before the sensor can be connected and the SHARC powered on, the type of sensor needs to be selected using the rotary switch accessible through the port. The port is covered with a plastic cap which can be removed with a flat-blade screw driver.

The rotary switch on the inside has four positions, one for each supported sensor type.

POSITION	FUNCTION
Pos 0	Discrete PNP
Pos 1	Discrete NPN
Pos 2	Analog 0V to 10V
Pos 3	Analog 4mA to 20mA

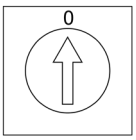
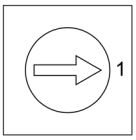
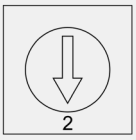
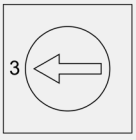


Caution: Turning the switch while a sensor outputting 24V on the signal pin is connected, may over-drive the current sensing circuit. This can result in a blown 50mA fuse in the sensing electronics.

FACTORY RESET

Disconnect the Ethernet cable from the SHARC. Hold down the user button and plug in the Ethernet cable to power on the SHARC. The status light will change from yellow to magenta color. Keep holding down the user button until the status light changes to white color. Release the user button. The device will restart using factory settings.

WIRING EXAMPLES

PNP		PNP + NPN WIRING SHARC: 1 → 24V → Brown; 4 → Signal → Signal Output; 3 → ØV (GND) → Blue Sensor
NPN		
0 - 10V		ANALOG WIRING (V & mA) SHARC: 1 → 24V → Brown; 4 → Signal → Signal Output; 3 → ØV (GND) → Blue; Signal Return (GND) Sensor
4 - 20mA		

ELECTRICAL CHARACTERISTICS

PARAMETERS	MIN	TYP	MAX	UNITS	REMARKS
Supply Voltage	40	48	60	V	Rated for IEEE 802.3af PoE standard.
Supply current (no sensor)	9	13	18	mA	
Supply current (with sensor)	200		300	mA	At a power consumption of 12W total.
Power consumption (no sensor)	0.55	0.62	0.72	W	
Power consumption (with sensor)			12	W	The connected sensor may draw up to 10W. 2W reserved for SHARC module.
Voltage available to sensor		24		V	
Continuous current available to sensor			500	mA	Output protected by 500mA resettable PTC fuse.
Voltage range for PNP input	12		28	V	Same as sensor supply voltage.
Voltage output for NPN input detection		24		V	Signal input protected up to 28V. Usable range shouldn't exceed 10V.
Range for analog current input	0		24	mA	Signal input protected up to 30mA. Usable range shouldn't exceed 24mA.
Effective sampling rate for analog inputs		100		S/sec	
Effective sampling rate for digital inputs		100	10000	S/sec	
Ethernet speed	10		100	Mb/sec	
Bluetooth range			15	ft	
Environmental operating temperature	-5		45	°C	