



National Centre for Physics

Detailed specification Document

A-224

S.No	Item, Model, Manufacturer	Specification	A/U	QTY
1.	Item: USB-6453 MOUNTING KIT FOR DIN RA Model: 789955-01 Manufacturer: NI	<ul style="list-style-type: none"> • Accessory Type: Mounting Kit • RoHS Status: ROHS3 Compliant • Required all necessary screws, nuts and components. 	Nos	1
2.	Item: Proximity Sensor Model: MAE1-AP-1A or equivalent Manufacturer: AutomationDirect	<ul style="list-style-type: none"> • Sensor Type: Magnetic • Switching Output: PNP • Number of Wires: 3 • Power: 10 to 30 VDC • Cable Length: 6.5ft/2m • Mounting Type: Flush • Switching Frequency: 5KHz • Sensing Distance: 60mm • Required all necessary cables, screws and connectors. 	Nos	3
3.	Item: Accelerometer Mounting Kit Model: CMCP250 Accelerometer Mounting Kit or equivalent Manufacturer: STI Vibrations	<ul style="list-style-type: none"> • Complete Kit • 1" Spot Facer • 25 Mounting Pads • 8 Motor Fin Mounts • Adhesive and Activator • 1/4"x28 UNF Tap • Silicone (Grease and RTV) • Adhesive Filler • Required all necessary cables and connectors. 	Nos	1
4.	Item: Isolated DC Voltage Sensor Model: ATO-VOS- DC1000 or equivalent Manufacturer: ATO	<ul style="list-style-type: none"> • Input range: DC 0-10mV ~ 0-1000V • Load capacity: $\leq 300\Omega$ • Supply: 24V DC. • Response time: $\leq 150\text{mS}$. • Output: 4-20mA: $\leq 33\text{mA}$ • Isolation features: Isolation between input, output and power supply • Required all necessary cables and connector. 	Nos	3
5.	Item: Micro Detectors mounting bracket Model: ST08C or equivalent Manufacturer: Micro Detectors	<ul style="list-style-type: none"> • For Use With: 8mm sensors • Orientation: Right-angle • Material: Zinc plated steel • Required all necessary screws, nuts and components. 	Nos	3
6.	Item: GRAS AM0069 Windscreen for 1/2" Microphones Model: GRAS AM0069 Manufacturer: GRAS	<ul style="list-style-type: none"> • Description: AM0069 contains 5 spherical windscreens for 1/2" microphones optimized for sound pressure measurements under free-field conditions. • Outer diameter: 90 mm • Hole diameter: 12 mm • Material: Foam • Required all necessary components. 	Nos	1
7.	Item: Damping magnet, M1.0, barium ferrite Model: MAG-1 or equivalent Manufacturer: AutomationDirect	<ul style="list-style-type: none"> • Magnet Type: M1.0 • For Use With: Magnetic proximity sensors • Material: Samarium cobalt • Required all necessary components. 	Nos	4

8.	<p>Item: Damping magnet, M5.0, barium ferrite Model: MAG-5 or equivalent Manufacturer: AutomationDirect</p>	<ul style="list-style-type: none"> • Magnet Type: M1.0 • For Use With: Magnetic proximity sensors • Material: Barium ferrite • Required all necessary components. 	Nos	
9.	<p>Item: 4 Port USB C Hub 10Gbps - Metal Industrial USB-C Hub - 2x USB-C & 2x USB-A - ESD Surge Protection - USB-C or USB-A Host - Self-Powered Mountable USB 3.2 Gen 2 Type-C Hub - TAA Model: StarTech 4 Port USB C Hub 10Gbps or equivalent Manufacturer: StarTech</p>	<ul style="list-style-type: none"> • Mfr Part #: HB31C2A2CME • SHI Part #: 41939710 • Description: StarTech.com 4 Port USB C Hub 10Gbps, Metal Industrial USB-C Hub, 2x USB-C & 2x USB-A. ESD Surge Protection, USB-C or USB-A Host, Self-Powered, Mountable USB 3.1 Gen 2 Type-C Hub - Commercial/Rugged USB Hub - Hub - 2 x USB 3.2 Gen 2 + 2 x USB-C 3.2 Gen 2 - desktop • ports Qty: 4 • Type: Hub • Product Color: Black • Required all necessary cables, connector, screws and nuts. 	Nos	1
10.	<p>Item: USB to USB C Cable Model: StarTech 3 ft 1m USB to USB C Cable or equivalent Manufacturer: StarTech</p>	<ul style="list-style-type: none"> • Mfr Part #: USB31AC1M • SHI Part #: 30487508 • Speed: USB 3.1 10Gpbs • Type: USB-C (M) to USB Type A (M) • Cable length: 3 m • Color: black • Compliant Standards: USB 3.1, RoHS, USB-IF • Required all necessary cables and connector. 	Nos	1
11.	<p>Item: Horizontal Liquid Water Level Sensor Manufacturer: Chinese</p>	<ul style="list-style-type: none"> • Material: plastic • Colour: black • Switch power (Max): 10W • Switching voltage (Max): AC 220V • Switching current (Max): AC 0.5A • Contract resistance: not more than 200 milli-ohm • Temperature rating: -20 to + 80 Celsius degrees • Cable length: About 400 mm / 15.76" • Float length: 85 mm / 3.35 • Maximum load 10W • Maximum voltage 220v • Package Included: 1x Water Level Sensor Float Switch • Required all necessary components. 	Nos	4
12.	<p>Item: Gravity Analog Temperature Sensor Model: DFR0023 or equivalent Manufacturer: DF Robot</p>	<ul style="list-style-type: none"> • LM35 Sensor • Interface: Analog • Working Voltage: 3.3-5V • Sensitivity: 10mV per degree Celsius • Functional range: 0 degree Celsius to 100 degrees Celsius • Can be used to detect ambient air temperature • Required all necessary cables and connectors. 	Nos	3
13.	<p>Item: GRAS 42AG, Multifunction Sound Calibrator Model: GRAS 42AG Manufacturer: GRAS</p>	<ul style="list-style-type: none"> • Sound pressure level: 94 dB or 114 dB • Frequency: 250 Hz or 1 kHz • ANSI: S1.40 • IEC: 60942 class 1 • Stabilizing time: 20 seconds • Battery life: > 10 hours • Size (LxWxH): 97x51.5x41 mm / 3.8x2.0x1.6 • Required all necessary cables, connectors and calibration certificates 	Nos	1
14.	<p>Item: Triaxial Mounting Block Model: CMCP200T or equivalent</p>	<ul style="list-style-type: none"> • Holds Three Single Axis Accelerometer or 4-20mA Sensors • Vertical, Horizontal and Axial Positions • Single Bolt Mount • 1" (25.4 mm) Rounded Mounting Surface 	Nos	5

	Manufacturer: STI Vibrations	<ul style="list-style-type: none"> • Standard ¼-28 UNF Mounting Bolt • Includes Mounting Hardware <p>Required all necessary screws, nuts and components.</p>		
15.	Item: Accelerometer Mounting Studs (10 Pack) Model: CMCP230 or equivalent Manufacturer: STI Vibrations	<ul style="list-style-type: none"> • 10 Pack • Stainless Steel • Lengths: 1/2" • 1/4"x28 UNF Thread • Allen Head <p>Required all necessary cables and connectors.</p>	Nos	1
16.	Item: Vibration Compact and Portable Meter Model: HS-620 Portable meter or equivalent Manufacturer: Hansford Sensor	<ul style="list-style-type: none"> • Velocity & bearing condition • Used to monitor vibrations without installing equipment • Rechargeable battery used with mains or in-car charger • Sensor/cable fault indicator • Display hold function • Choice of metric or imperial measurement <p>Required all necessary cables, connectors and calibration certificates</p>	Nos	1
17.	Item: AC to DC Power Supply Model: HDR-60-5 or equivalent Brand: MEAN WELL	<ul style="list-style-type: none"> • Description: AC-DC Ultra slim DIN rail power supply; Input range 85-264VAC; Output 5VDC at 6.5A; Pass LPS • Output Power (W): 60W • Output Voltage (V): 5V • Output Current (A): 5A • Input Voltage (V): 110/230 universal input <p>Required all necessary screws, nuts and components.</p>	Nos	1
18.	Item: EMC/EMI Line Filter Model: FN3258-16-44 or equivalent Manufacturer: Schaffner EMC Inc.	<ul style="list-style-type: none"> • Description: Three Phase (Delta) EMC/EMI Line Filter • 16 A DC ~ 60Hz Single Stage Terminal Block • Configuration: Single Stage • Voltage - Rated AC (Phase to Ground/Neutral): 277 V • Voltage - Rated AC (Phase to Phase): 480 V • Current: 16A • Frequency – Operating: DC ~ 60Hz <p>Required all necessary components.</p>	Nos	1
19.	Item: Digital Multimeter Model: MM-720 or equivalent Manufacturer: Klein tools	<ul style="list-style-type: none"> • Multimeter with automatic ranging true root mean square (TRMS) technology for increased accuracy • Tester measures up to 1000V AC/DC voltage, 10A AC/DC current and 60 MOhms resistance plus temperature, capacitance, frequency, low impedance (L_{oz}), duty-cycle, test diodes and continuity • Low battery indicator and easily accessible battery and fuse compartment • Includes carrying pouch, test leads, thermocouple with adapter, and batteries • CAT IV 600V Safety Rating <p>Required all necessary cables and connectors.</p>	Nos	1
20.	Item: RIGOL Digital Oscilloscope Model: DS2202A or equivalent Manufacturer: Rigol	<ul style="list-style-type: none"> • Analog channel bandwidth: 200 MHz • 2 analog channels • Real-time Sample Rate: analog channel up to 2 GSa/s • "Up to 65,000 frames hardware real-time waveform record, playback and • Analysis functions (standard)" • A variety of trigger and bus decoding functions (Parallel, RS232, I2C, SPI, CAN) • Low noise floor, vertical scale range: 1 mV/div to 10 V/div • 8-inch TFT (800x480) WVGA, up to 256 levels intensity grading waveform display <p>Required all necessary cables and connectors.</p>	Nos	1
21.	Item: Oscilloscope Probes Model: DS2202A or equivalent	<ul style="list-style-type: none"> • High Z passive probe. Switchable.350 MHz Passive Probe with 1x:10x selector. • Input Impedance $1 M\Omega \pm 1\%$ 	Nos	2

	Manufacturer: Rigol	<ul style="list-style-type: none"> • Bandwidth: DC ~ 35 • Compensation Range 6 pF ~ 24 pF • Voltage: CAT II 300 VAC • Length: 1.4 m <p>Required all necessary cables and connectors.</p>		
22.	Item: Vernier Caliper Model: Insize 0 - 200mm Digital Vernier or equivalent Manufacturer: Insize	<ul style="list-style-type: none"> • Reading :0.01mm/0.0005" • Strictly made in accordance with DIN862. • Part no 1108-200 • Range 0-200mm • LCD display • Imperial / metric button • Locking Screw • Zero button • Thumb roller • 5 Minute auto off • Supplied with CR2032 battery <p>Required all necessary components.</p>	Nos	1
23.	Item: BNC to Alligator Crocodile Clips Model: SKU: 240-134 Manufacturer: Diligent, Inc.	<ul style="list-style-type: none"> • Configuration: BNC (1st plug) to Alligator (2nd Plug) • BNC connection method • Terminated with one black and one red alligator clip • 39.37 inches (100 ± 2cm) total length • 7 inches (18cm) black and red lead lengths • 26AWG <p>Required all necessary components.</p>	Nos	4
24.	Item: Crimping Tool Set for Insulated Terminals, 0.5-6mm ² Ratchet Crimping Tool, Terminal Pliers, Crimping Tool Kit with 700 Insulated Flat Ring Crimp Connectors Model: Crimping Tool Set with terminal plier or equivalent Brand: Dechengbao	<ul style="list-style-type: none"> • Colour: Blue, Yellow, Red • Item weight: 1.1 Kilograms • Handle material: Alloy Steel • Grip type: Ergonomic <p>Required all necessary components.</p>	Nos	1
25.	Item: Current Diode Model: E-452 or equivalent Manufacturer: Semitec USA Corp	<ul style="list-style-type: none"> • Voltage - Anode - Cathode (Vak)(Max): 100V • Regulator Current (Max): 4.5mA • Voltage - Limiting (Max):3.7V • Mounting Type: Through Hole <p>Required all necessary components.</p>	Nos	20
26.	Item: Current Diode Model: E-822 or equivalent Manufacturer: Semitec USA Corp	<ul style="list-style-type: none"> • Voltage - Anode - Cathode (Vak)(Max): 50V • Regulator Current (Max): 9.8mA • Voltage - Limiting (Max):3.01V • Power (max): 300mW • Mounting Type: Through Hole <p>Required all necessary components.</p>	Nos	10
27.	Item: Terminal Block 8 Positions Dual Rows Covered Screw Terminal Block Part Number: DZP-2508 or equivalent Manufacturer: Ruidee	<ul style="list-style-type: none"> • Material: Plastic, Metal, Copper • Voltage: 600 Volts • Current: 25A • Covered Screw: Yes <p>Required all necessary screws, nuts and components.</p>	Nos	1
28.	Item: 6PCS Fork Type 600V 25A 5mm Pitch Manufacturer: Chinese	<ul style="list-style-type: none"> • Material: Plastic & Metal, • Voltage: 600 Volts • Current: 25A <p>Required all necessary components.</p>	Nos	2
29.	Item: Desoldering Pump Model: ADT03 or equivalent	<ul style="list-style-type: none"> • Material: Alloy + Plastic • Operating Voltage:220V, 50Hz • Heater Power: 30W 	Nos	1

	Manufacturer: Chinese	<ul style="list-style-type: none"> • Packing List: 1 * Welding Removal Machine, 1 * Steel Drilling Rods, 3 * Suction Nozzle Required all necessary cables and components.		
30.	Item: Soldering Iron Bit Head Tin Cleaning Ball Model: JZQ-599B or equivalent Manufacturer: Chinese	<ul style="list-style-type: none"> • Used for eliminating the temperature variation of soldering tip. • JZO 599B soldering iron tip clean ball to remove oxides of effects of non-cleaning sponge. Required all necessary cables and components.	Nos	2
31.	Item: XYK Helping Hands Soldering Station Manufacturer: XYK	<ul style="list-style-type: none"> • XYK Helping Hands Soldering Station or equivalent • Heavy Duty Base: 7.87" x 5.51" rectangular painted steel base • Sturdy Gooseneck and Insulated Alligator Clips Required all necessary screws, nuts and components.	Nos	1
32.	Item: Operational Amplifier Model: OPA2277PA or equivalent Manufacturer: Texas Instruments	<ul style="list-style-type: none"> • Voltage – Supply: 4V ~ 36V • Current - Output / Channel: 35mA • Voltage - Input Offset: 20 μV • Mounting Type: Through Hole • Package / Case: 8-DIP Required all necessary components.	Nos	10
33.	Item: Transistor NPN Model: KSD1616AGTA or equivalent Manufacturer: onsemi	<ul style="list-style-type: none"> • Transistor Type: NPN • Current - Collector (Ic) (Max): 1A • Voltage - Collector Emitter Breakdown (Max): 60V Required all necessary components.	Nos	10
34.	Item: Transistor PNP Model: KSA1281YTA or equivalent Manufacturer: onsemi	<ul style="list-style-type: none"> • Transistor Type: PNP • Current - Collector (Ic) (Max): 2A • Voltage - Collector Emitter Breakdown (Max): 50V • Power – Max: 1W Required all necessary components.	Nos	10
35.	Item: WESTWARD Electronic Torque Wrench: Inch-Pound/Newton-Meter, 12.5 to 250.7 ft-lb, Ratcheting Model: 4RYL8	<ul style="list-style-type: none"> • Drive Size: 1/2 inch • Torque Range (N-m): 17 to 340 N-m • Alloy Steel • Torque Measurement Type: in-pl; Nm • Handle Type: • Ergonomic • Overall Length:25-5/8 in Required all necessary components.	Nos	1
36.	JNOEEDWN Propellers S500 V2 Kit X500 Kit Replacement 1045 10X4.5 10inch Self-Locking Propeller CW CCW/Fit for RC Multirotor Airplane Parts	<ul style="list-style-type: none"> • Model: 1045 • Model Number: Propeller 1045 • Fit For S500 V2 Kit&X500 Kit • Type: Propeller • Use: Drones • Spare part of X500 V2 kit • Color: 2pairs (contain 2 pieces of black and 2 piece of silver) 	Nos	4
37.	RadioMaster TX16S Mark II Radio Controller (Mode 2)	<ul style="list-style-type: none"> • Item: TX16S Mark II • Sku: 31105 • Holybro • Size: 287x129x184mm • Weight: 750g (without battery) • Transmission frequency: 2.400GHz-2.480GHz • Transmitter module: Internal 4-in-1 multi-protocol module (CC2500 CYRF6936 A7105 NRF2401). • Transmitting power: Internal 4-in-1 multi-protocol module: Max 100mw (protocol dependent) • SD card: 256MB by default, 8GB maximum • Antenna gain: 2db (transmit power adjustable) • Working current: 400mA • Working voltage: 6.6-8.4v DC • Remote control distance:> 2km @ 22dbm 	Nos	1

		<ul style="list-style-type: none"> • Radio firmware: EdgeTX • Module Firmware: Multiprotocol- Module (4IN1) -OR- ExpressLRS (ELRS) • Channels: Up to 16 channels (depending on the receiver) • Display: 4.3-inch TFT full-colour touch display with a resolution of 480 * 272 • Gimbal: Option 1: V4.0 Hall sensor with Aluminium fascia: • Module Bay: JR compatible module bay • Upgrade method: Supports USB-C online / SD card offline upgrade • Required all necessary components. 		
38.	RadioMaster R81 Receiver	<ul style="list-style-type: none"> • Item: TX16S Mark II • Sku: 31105 • Manufacturer: Holybro • Channels: 8CH • Frequency range: 2400-2483.5Mhz • Power input range: 4.5-6V • Signal format: FrSky D8 Compatible • Output format: SBUS (Inverted) • Support return: support return RSSI • Control distance: more than 1km • Antenna length: approximately 6cm • Size: 17*11 mm • Weight: 2g • Includes <ul style="list-style-type: none"> • 1x RadioMaster R81 SBUS D8 2.4GHz Nano Receiver (pre-soldered with 3-pin female Dupont connector) • 2x spare heatshrink tube • 1x 3-pin male Dupont connector 	Nos	1

Note: All the components installed should be compatible with the system and each other.

Please tick the relevant box

Installation Testing Commissioning Training

Warranty requirement Any other please specify