QUICKSTART

HAWK SOLUTIONS

A higher level of performance
This is a quickstart for the Sultan series.
A full version manual can be downloaded from
www.hawkmeasure.com
SYSTEM COMPONENTS

Remote systems consist of an amplifier and separate transducer of varying size & shape depending on frequency

SMART & Integral units combine both the amplifier and transducer functions in a single housing
FLANGE AND CONE ASSEMBLY

1. Remove red cap (including cardboard).

2. Screw the flange assembly fully down onto the cone (as far down as it will go until the parts are tightly fastened).

3. Screw the transducer tightly down onto the flange and cone assembly.

4. Tighten the locking ring down to the flange to fix the components in place.

COMPLETE ASSEMBLY
(appearance above flange may differ for integral and smart units).

Note! Direction of flange, smallest ring this way up ↑

User mountings should only connect to the larger (lower) isolated mounting flange. No other part of the sensor assembly should touch any other structure or object.
WIRING THE UNIT

Sultan Remote Units

The Sultan Remote amplifier has wiring information printed inside the flip lid of the unit.

Unscrew the lower flip lid to access the wiring terminals.

Ensure your power source is deactivated before handling power wires.

Pass cables through the cable entry gland before wiring into the terminal block.

To connect a wire, push down on the button above the terminal with a small flat head screwdriver and place the wire in the terminal. Release the pressure on the button to close the terminal and then pull on the wire to check that it is secure.

The transducer terminals are labeled by colour on the PCB.

If you are connecting HawkLink communications, connect the blue wire to B and the white wire to A. The black wire can be connected to the DC- or GND terminal next to A.

Tighten cable entry gland(s) and cover to ensure sealing is effective.

### 234 wire version

<table>
<thead>
<tr>
<th>RELAY 1</th>
<th>RELAY 2</th>
<th>RELAY 3</th>
<th>RELAY 4</th>
<th>RELAY 5</th>
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</table>

- **Is** + -
- **4-20mA**
- **TRANSUCER**
- **COMMS**
- **DC-In**
- **AC-In**

**Sinking 4-20mA from user device**

**OR**

**Sourcing 4-20mA from Sultan**

### 2 wire version

<table>
<thead>
<tr>
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</table>

- **Test In**
- **COMMS**
- **A**
- **B**
- **Shld**
- **Shld**

**Sinking 4-20mA from user device**

**OR**

**Sourcing 4-20mA from Sultan**
WIRING THE UNIT

Sultan Integral Units

*The Sultan Integral unit has wiring information printed inside the flip lid of the unit.*

Unscrew the lid to expose the facia. The lid can be snapped back to allow easier access for wiring. When finished, first re-snap the double hinge into position before closing the lid. The top half of the facia is a flip cover which exposes the wiring terminals.

Ensure your power source is deactivated before handling power wires.

Pass cables through the cable entry gland before wiring into the terminal block.

To connect a wire, push down on the button above the terminal with a small flat head screwdriver and place the wire in the terminal. Release the pressure on the button to close the terminal and then pull on the wire to check that it is secure.

If you are connecting HawkLink communications, connect the blue wire to B and the white wire to A. The black wire should be connected to the Shld terminal.

Tighten cable entry gland(s) and cover to ensure sealing is effective.

<table>
<thead>
<tr>
<th>234 wire version</th>
<th>2 wire version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RELAY 1</strong></td>
<td><strong>COMMS</strong></td>
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<td><img src="image" alt="Diagram" /></td>
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<tr>
<td>AC-In</td>
<td>4-20mA</td>
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<tr>
<td><img src="image" alt="Sinking 4-20mA" /></td>
<td><img src="image" alt="Sourcing 4-20mA" /></td>
</tr>
</tbody>
</table>

Ensure that any unused cable gland entries are plugged or sealed.
WIRING THE UNIT

Sultan Panel Mount Units

*The Sultan Panel Mount has wiring information printed on the back of the unit.*

Terminal blocks can be removed during installation to allow easier wire connection. Take care to return them to the correct position.

Ensure your power source is deactivated before handling power wires.

Ensure terminals are open by screwing counter clockwise with a flat head screwdriver. Place the exposed wires into the open terminals and tighten until firm.

The transducer terminals are labeled by colour on the back panel.

If you are connecting HawkLink communications, connect the blue wire to B and the white wire to A. The black wire can be connected to the DC- or GND terminal next to A.

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*Sourcing 4-20mA from Sultan*

*Sinking 4-20mA from user device*
WIRING THE UNIT

Sultan SMART Units
The Sultan SMART unit has wiring information printed inside the lid of the unit.

Screw Cap Version
Unscrew the lid to expose the terminals. It is recommended you remove the terminal block from the unit before wiring - to do this, insert a screwdriver into one of the middle terminals to lever the block out.

Pass the cables through the cable entry gland before wiring in to the terminal block.

Ensure the terminal is open by screwing counter clockwise with a flat head screwdriver. Place the exposed wires into the open terminals and tighten until firm. Insert the block back into the unit when wiring is complete. Press firmly on the plug in terminal block to ensure it is fully home.

If you are connecting HawkLink communications, connect the blue wire to B and the white wire to A. The black wire can be connected to the DC- terminal next to B.

Tighten cable entry gland(s) and cover to ensure sealing is effective.

IP68 Sealed Cable Version
Connect the free ends of the cable following the wire colours as shown in the terminal diagrams.
WIRING 4-20mA OUTPUT

When connecting the 4-20mA output to a user device such as a PLC input, DCS or indicator, use a voltmeter to check the field wires to be used for the 4-20mA signal. If DC voltage around 24V is present, use sinking connection. If no voltage is present, use sourcing connection.

**SOURCING Type Output**

Voltage free user device

+ 4-20mA

RL Max 270Ω

Sultan output is sourcing current and provides voltage to drive a passive load, PLC input, indicator or other user device.

NOTE:
Isolated current output can be made common with +DC or GND if required.
(e.g. RL – connected to GND)

**SINKING Type Output (also 2 wire loop powered)**

User device including +24VDC source

+ 4-20mA

Sultan output is sinking current. Voltage to drive current loop must be provided by PLC, indicator, other user device or external DC supply.

NOTE:
RL Max = 750Ω if user DC Supply 24V

For further connection options see Sultan manual.
INCORRECT MOUNTING

These are examples of common INCORRECT mountings which can prevent the unit from operating correctly.

Do NOT mount near infeed

Do NOT mount over or adjacent to any obstacles

Do NOT mount cone or transducer face above roofline

Do NOT mount on angle in liquid applications
CORRECT MOUNTING

- Mount away from infeed
- Mount away from all obstacles
- Mount cone / transducer face within the vessel
- Mount perpendicular to liquids
INSTALLATION GUIDE

AMPLIFIER
Select a suitable mounting position that is protected from direct sunlight. If necessary, utilize a sun hood (Hawk supplies purpose made sun hoods). Observe the minimum and maximum temperature limits (-20°C/-4°F to 60°C/140°F) Do not mount near sources of electrical noise such as high current cables, motor starters, or variable speed drives. Avoid mounting in high vibration areas such as handrails and rotating plant. Use rubber absorption mounts if mounting in light vibration areas. Protect the PCB assembly before knocking out the cable and conduit entry holes.

TRANSDUCER
Selecting a suitable position to mount the transducer on the vessel is the single MOST IMPORTANT step. Please read all of the installation guide and contact your Hawk representative if you have any doubts or questions. The transducer face MUST be at least the blanking distance away from highest product level in the vessel. Use common sense when selecting the transducer mounting position. A clear line of sight from the transducer to the product being monitored is required. Take into account the change in material shape and level. The acoustic pulse must reflect back to the transducer.

PANEL MOUNT
- Select a suitable position within a panel layout which allows clearance around the outside of the front panel of the unit and also behind the panel for clearance around the screw fixing clamps used to retain the unit.
- Ensure that sufficient space is available behind the panel to accommodate the depth of the amplifier housing, and also allow cable bend clearance for wiring to the terminals on the rear of the amplifier.
- Mark and cut a 90x90mm (3.54x3.54") square cut out through the panel in the desired position.
- Insert the Sultan amplifier through the panel and install supplied screw clamps into the slotted holes in the amplifier housing. Tighten the screws until just firm to secure the amplifier in place.
- Connect wiring as required to the correct terminals on the removable rear panel connectors. When plugging connectors in to the rear panel, ensure that they are re-installed in the correct position.
Incorrect Mounting
Failure to mount the unit suitably can result in incorrect measurement and may cause process issues such as overfilling or damage to critical components.

Process Conditions
Ensure the process conditions within the vessel such as temperature, pressure and chemical composition of contents are within the specifications Sultan unit. The unit should not normally come into contact with the measured content.

Minimum Insertion
The transducer face or cone must be at least 50mm (2 inches) inside the tank. If the transducer needs to be mounted above the roof line, use an appropriate standpipe or nozzle.

Moisture Seal
Sultan Integral and Smart units have cable glands with a moisture seal which must be tightened around the cable. Any unused glands must be plugged and sealed.

Transducer Location
It is vital that the Transducer has a clear view of the product surface at all times and is kept away from the inflow to avoid interference.

Blanking Distance
The unit will ignore any echoes and will never measure within its Blanking distance. Minimum values must be respected. Where possible use the conservative values and increase this distance by 50% if there is foam, dust, steam, or condensation in the vessel being monitored. (Refer to Blanking Distance table.)

If using a flange mounting, use a rubber or neoprene gasket and washers. If using a nipple mounting, ensure that the mounting bracket is >6mm (0.24 in) from the rear of the transducer. Do not over tighten the lock nuts.

<table>
<thead>
<tr>
<th>Blanking Distance</th>
<th>Transducer Frequency</th>
<th>Minimum</th>
<th>Nominal</th>
<th>Conservative</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWRT50 50kHz</td>
<td>0.25m (10&quot;)</td>
<td>0.3m (1ft)</td>
<td>0.35m (1.2ft)</td>
<td></td>
</tr>
<tr>
<td>AWRT40 40kHz</td>
<td>0.3m (1.1ft)</td>
<td>0.35m (1.2ft)</td>
<td>0.4m (1.4ft)</td>
<td></td>
</tr>
<tr>
<td>AWRT30 30kHz</td>
<td>0.35m (1.5ft)</td>
<td>0.4m (1ft)</td>
<td>0.5m (2.2ft)</td>
<td></td>
</tr>
<tr>
<td>AWRT20 20kHz</td>
<td>0.5m (2.2ft)</td>
<td>0.6m (1.3ft)</td>
<td>0.8m (2.6ft)</td>
<td></td>
</tr>
<tr>
<td>AWRT10 10kHz</td>
<td>1.0m (3.3ft)</td>
<td>1.1m (3.5ft)</td>
<td>1.3m (4.2ft)</td>
<td></td>
</tr>
<tr>
<td>AWRT5 5kHz</td>
<td>1.2m (3.9ft)</td>
<td>1.4m (4.6ft)</td>
<td>1.5m (5ft)</td>
<td></td>
</tr>
</tbody>
</table>

Always use conservative nominated distances if possible
INSTALLATION EXAMPLES

**SOLID (Granular)**
Aim transducer at point of outfeed.

**LIQUID**
Transducer should be vertical.

**DUAL OUTFEED**
Two transducers may require anti-crosstalk wiring setup (see manual).

**POWDER**
Mount away from infeed.

**MOUNTING POSITION**

**NOZZLE MOUNT**
Minimum 50mm

**FLUSH MOUNT**

**STAND PIPE MOUNT**
Minimum 50mm

**2" VERSION**

**Correct**
Threaded mounting should only be used where a flange/cone mounting is impossible.
Hawk recommends & supplies focaliser cones for all transducers.

**Incorrect**
Face must not be inside mounting

**Incorrect**
Intrusive pipe
SETTING YOUR SYSTEM

After the unit has been installed, mounted and powered you can now enter the Quickstart settings to get the unit operational in your application conditions.

Be sure to enter settings for High & Low level, App Type, Fill Rate and Empty Rate of your vessel.

If you are unsure of your specific fill & empty speed enter a value you are sure is faster than your process.

All of the mentioned settings (except Blanking) are in the ‘Quickset’ menu of the unit. You access this menu on the control pad by pressing CAL and entering Unlock code 0.

You may also need to set relay switch points. These are found in ‘Output Adjustment’. Relay alarms can be set on/off for hi/lo levels and fail-safe.

(A) Transducer Face - Top of Flange
(B) End of Blanking Zone
(C) High Level or 100% (20mA) position.
(D) Product Level being measured
(E) Low Level or 0% (4mA) position.

High Level = Distance A to C
Low Level = Distance A to E

**QuickSet**

**Unit**
- Select unit of measurement from Feet, Metres, Centimeters, Inches
- Adjust vessel low level (maximum measured distance from transducer face)

**Low Level**
- Adjust vessel high Level (minimum measured distance from transducer face)

**High Level**

**Fail Safe**
- Select FailSafe mA output
- Select Fail time (seconds)

**App Type**
- Position: Slurry, Solids, Liquids
- Fill Rate
- Empty Rate
- Adjust vessel fill rate
- Adjust vessel empty rate

**Display Mode**
- Avg Matri Diff O/P
- Space Material
- Material% Flow Volume Flow Tbl

**Output Adj**
- Filling damping.
- Number of pulses averaged for output

**Empty Damp**
- Adjust Empty Damping

**Rly Mode 1**
- Set Relay Level 1 & Relay Level 2
- Relay Triggers - Denergise, Energise, Fail Safe, Off

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Note: If using GosHawk PC comms you must change fill & empty rate AFTER selecting app type.