**iSTAR Calibration Instructions**

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| --- | --- |
| **Station Name:** | **File:** STN |
| **Performed By:** | **Date:** |

Add a tick to the left of each bullet point to indicate that the instruction has been performed.

Prior-to-trip notifications e.g. DoSenSys, Airport Company, and ACNZ must be issued before travelling to site.

# Site Work Planning

* **Health, safety, and risk management:**
* Evaluate the site and the work you need to perform using a Job Safety Analysis (JSA) form to document the process. This form will take you through the required risk mitigation, emergency planning, and toolbox meeting processes and should be completed PRIOR to commencing work.

# If You are Only Servicing 1 or 2 Sensors i.e. for a fault

You do NOT need to power down the iSTAR computer or disconnect ALL communications modems.

* Perform all the data client notifications (see below for full detail).
* For each sensor to be serviced:
* In the MetMESSAGE program that is communicating with the sensor(s) Log in as Technician and select Last 'Saved Data' - Save (off). This will stop all data from going to the database for that MetMESSAGE.
* Service the sensor and perform all required testing (refer to the Field Test Sheets for full detail).
* In the MetMESSAGE program that is communicating with the sensor log in as Technician and select Last 'Saved Data' - Save (on). This will restart the data going to the database for that MetMESSAGE.
* Perform other checks as necessary (see below for options)

The Last 'Saved Data' - Save (off) feature includes a timer to turn itself back on after 6 hours of program inactivity - If you forget to set Save (on) you don't have to return to the site.

When the Last 'Saved Data' - Save feature is turned on the Real Time Data Set for that MetMESSAGE is initialised, thereby clearing all time derived data that may include test data.

* **Customers on-line**: Phone on site customers and confirm data is received and correct.
* **MetService on-line**: Check with the duty engineer:
* CSD one minute data is arriving at the MetService ingest servers.
* Time is being received by the AWS.
* Use the Now buttons in the appropriate MetMESSAGE to make and send a METAR by email. Check that email messages are arriving at the MetService ingest servers.
* There is remote access to the computer (for broadband communications).

# For a Full Station Calibration

## Pre Cal checks

* **International AWS:** Before servicing a "live" International primary AWS (NZxxA) you MUST ensure the backup station is fully operational, including ALL sensors being functional and all data parameters are on-line.
* **Notify Users:** This shall include the MetService Service Desk and ALL major data stakeholders.
* At an ACNZ International or Secondary airport site:
* Phone the MetService "Aviation Forecaster" [04-4700-808] and inform him/her of your work plan and get approval to perform the works.
* Contact the ACNZ Technical Coordinator (Christchurch based) and confirm with him/her your program to service the AWS equipment. ACNZ will likely issue a NOTAM.
* Liaise with the duty ACNZ Air Traffic Controller (ATC) to obtain an equipment release from service.
* **Before readings:** Turn on the iSTAR PC display, log onto PC and select the MetMESSAGE CSD Make Message driver, then use the < and Last Made Message buttons, to record BEFORE figures on Page 1 of the calibration worksheet.
* **Shared Logs:** In any MetMESSAGE driver, log into it and go to Technician / shared logs, check the fail error log and the fatal error logs, recording findings on page 1 of the Calibration Worksheet.
* **Customer Notifications/Permissions:** At an aviation site, phone the tower and other customers, advise them you are on site and performing maintenance, and for International AWS there should be no data loss, and for non-International AWS there will be short periods of sensor data loss.
* **Disconnect the AWS: from all off-site communications to inhibit test data being sent out, but noting...**
* Do NOT disconnect shared routers from main circuits (disconnect only the AWS from the router).
* Do NOT disconnect shared Ethernet switches from connections (disconnect only the AWS from the switch).
* Do NOT disconnect multiport serial devices (e.g. Edgeports) from the AWS (disconnect only feeds on which data leaves the AWS site).
* **International AWS Central Data Failover Check:** If taking down a "live" International primary AWS (NZxxA) you MUST immediately check that the MetService ingest system has successfully switched over to the backup station. If the switch over has not occurred successfully then immediately reinstate the "live" station and diagnose the fault before continuing. To check that the failover process is working perform the following...
* Stop the NZxxA AWS METAR and 1 minute data being sent before hh:52 (or hh:22).
* Phone the MetService Aviation desk (04 470 0808) and inform the Aviation Forecaster that you have taken down station NZxxA.
* Ask the Aviation Forecaster to check at hh:60 (or hh:30) that a METAR AUTO for NZxx has still been generated. *The METAR AUTO should have been created from the backup AWS NZxxB by hh:56 (or hh:26) but allow a few minutes for possible network/process delays.*
* Refer to the MetService Confluence (Wiki) page METAR AUTO Generation - User Guide for more detail on the MetService METAR AUTO generation.
* **Non AWS Systems Still On-line:** Check other systems that share the AWS communications are still on line e.g. web cameras. If other systems have failed then immediately reinstate the "live" station and diagnose the fault before continuing.
* **Move International AWS Real Time Data Feeds:** If taking down a "live" International primary AWS (NZxxA) you MUST immediately move the real time data feed connections (to the tower and Airways central system) from the primary AWS to the backup AWS. Check that the real time data feed connections customers still have data supply BEFORE taking down the Primary AWS.

Harvest SPE setups may be lost if power is left connected to a Harvest SPE modem while the RS232 serial communications port is disconnected and/or reconnected

## Maintenance

* **Sensor physical:**

Lowerable mast: If there is one then lower it.

Sensors and modules: Replace any that are due for replacement with calibrated units.

Grass, weeds, scrub: Clear as necessary.

Instrument screens: Clean and repair, or replace.

Solar panel(s): Clean and check orientation

Soil temperature probe(s): Clear grass and weeds, tamp down soil and check depths.

Wind sensor(s): Clean and check orientation.

Relative Humidity sensor(s): Check orientation... HMP155 = connector cable down,

HMP45 = connector cable up.

HMP155 in Beehive screen: Ensure a connector cover is fitted (for environmental protection). If missing add a note on the station data base to ensure one is installed next visit.

LiCor: Check cleanliness and level. Check sensor cable aligned to True South.

Raingauge: Remove cover; Check filter; Check level; OTA only - clean bucket bearings with can compressed air.

* **Computer Service**: Complete the document "Windows Computer Maintenance".
* **Software Installations**: Perform any required software updates and new installations.
* **Battery**:
* If the battery is due for replacement then do this now.
* If there are any water electrolyte batteries with removeable caps - Top up battery water levels.
* **Check all Earth point connections**: Mains, DC and Solar powered sites.
* **Electrical safety inspection:** If the site is mains powered then...
* Carry out inspection of electrical equipment as per AS/NZS 3760. Inspection interval for mains equipment in a non hostile environment is 5 yrs. (see Table 2 p29 in standard for other situations).
* Attach appliance test tags to equipment and mains leads.
* **Structures**: Carry out an inspection of the mechanical equipment as per the Structures Check Sheet.

## Calibration

* **Field Test**: Complete the iSTAR Field Test Sheet and Sensor Field Test sheets including the following:
* Check grass and soil temperature inputs to the ICPCON using the three resistors provided in iSTAR kit.
* Check Air temperature and Grass Min temperature against inspector’s thermometer.
* Perform the Raingauge Field Test Instructions using a HyQuest FCD-653 Raingauge Verifier.
* Check humidity against reference humidity sensor.
* If a WS425/WMT7xx is used as the wind sensor, or if the WS425/WMT7xx is to be changed, shut down the Get Message driver for that sensor, then communicate with the WS425/WMT7xx using HyperTerminal. Turn the WS425/WMT7xx off then back on to initiate self-tests. Use open<cr> to check the configuration of the WS425 (Mode is “NMEA Standard"). Perform checks.
* Perform Ceilometer checks:
* CL31: See page 52 of CL31 Manual for status comparison. Check that the heater blower runs satisfactorily. It should start within 1 minute of a sheet of white paper being placed on the glass window. Clean the window and lens.
* Perform Visibility-Present Weather sensor checks and calibration.
* Perform other System checks and calibration e.g. SUTRON, mSTAR etc.
* Refer to the field test sheets and Calibration instructions for these systems.
* Select the MetMESSAGE CSD Make driver and record after readings, and do "AFTER" checks.

# Post Cal checks

* **Confirm Network Configuration:**
* If computer is on the MetService LAN or WAN (VPN) confirm still Configured for Work Network:
* Select Control Panel / Network and Sharing Center / View your active networks.
* Confirm Work Network is still selected - if it is not then re-select it, save, close, reboot and reconfirm.
* If computer is NOT on the MetService LAN or WAN (VPN) confirm still Configured for Public Network:
* Select Control Panel / Network and Sharing Center / View your active networks.
* Confirm Public Network is still selected - if it is not then re-select it, save, close, reboot and reconfirm.
* **Compliance certificate**: Complete a Certificate of Compliance label and attach it to the upper right-hand corner of the AWS cabinet door (outside).
* **Update clock to correct time:**
* In the CSD send message with time sync turn on Task bar / Operator / Set Clock Next Main Comms.
* If there is no send message with time sync then manually set the Windows clock to within ±5 seconds of the current UTC time (either double click the displayed time in any MetMESSAGE program or use ...Control Panels / Date and Time).
* Check that the MetMESSAGE programs show correct UTC time.
* **Delete test logs**: Run MetMESSAGE-00 (Start Menu / Programs / MetMESSAGE / MetMESSAGE00) and log on as technician. Select Technician / Shared Logs / Delete All.
* **Skip calibration data**: On ALL Send Message programs select Task bar / Send Message / Set the Made Message last sent pointer to now. This will prevent the sending of any messages that contain calibration data.
* **Reconnect the AWS to all off-site communications.**
* **Move all International AWS Real Time Data Feeds back to the primary AWS.**
* **Customers on-line**: Phone on site customers and confirm data is received and correct (e.g. ACNZ ATC).
* **MetService on-line**: Use Now buttons in the make and send METAR by email. Check with the duty engineer:
* CSD one minute data is arriving at the MetService ingest servers.
* Time is being received by the AWS.
* Use the Now buttons in the appropriate MetMESSAGE to make and send a METAR by email. Check that email messages are is arriving at the MetService ingest servers.
* There is remote access to the computer (for broadband communications).
* **VDU turn off:** Exit “Last saved data/Activity monitor” using < button on screen, and turn off VDU.
* **Hut heater**: If present plug in and switch on the hut heater.
* **Site Exposure**: Check sensor exposures and take site photographs if required.
* At an ACNZ site inform the ACNZ Technical Coordinator (Christchurch) that the service is complete. ACNZ will likely cancel any NOTAM.

# Fault Finding

* **Megger Test Cables (only if necessary)**: Open sensor klippons or disconnect cables in the WXT-WMT cabinet and in the appropriate junction boxes i.e. at both cable ends. Megger the cables to ground, then close the klippons/reconnect cables at both ends. **Cables MUST be isolated at both ends BEFORE Meger testing**.

End