Quick Start Guide

First Use
The **Mx OnBoard** weigher leaves the factory almost ready for use. It has been pre-calibrated at ZERO, but cannot be accurately calibrated at SPAN until fully loaded. It will show an approximate weight, but this should be treated with caution. SPAN calibration must be carried out by the driver as soon as he has a known weight on board (weighbridge verified).

SPAN Calibration
- Ensure the vehicle is on flat even ground and the body is raised to the 'weighing' height (approximately 30cm/12").
- Turn on the weigher (press **[ON]** or flash sidelights).
- Press and hold **[ENTER]** until SEtUP appears.
- Press ▼ until SPAn is displayed.
- Press **[EDIT]** and use the ▼ ▲ ◄ buttons to enter the known payload.
- Press **[ENTER]** to display SUrE? and **[ENTER]** again to commence span calibration.
- 9ood should be displayed if successful (repeat if not).
- At this point note down the zero and span calibration figures:
- With ZEroFCt displayed, press **[EDIT]** and note down the zero factor.
- Press **[CANCEL]**, then ▼ to display CALFACt.
- Press **[EDIT]** and note down the displayed span calibration factor.
- Press **[CANCEL]**.

Step ▼ until SEtUP is displayed.
Press **[ENTER]** to return to NET weighing.
The correct weight should now be displayed.
Copy the zero and span factor values onto the Warranty Activation card and post back to **Mx OnBoard**.
Note: It should not be necessary to re-calibrate either zero or span, and it should be avoided until a definite trend towards weighing consistently 'heavy' or 'light' is established. Excessive re-calibration can result in 'tail-chasing' and poor repeatability.

ALARM
The alarm can be selected to sound when the maximum payload is exceeded. A short press on **[ENTER]** 'toggles' the alarm function on and off – as indicated by the ALARM light on the low right of the display.
Displaying and changing the alarm setpoint is done by:
- Press the ▼ button to display (for example) A 25000 (the current alarm setting).
- Press **[EDIT]** and use the ▼ ▲ ◄ buttons to change the setpoint value.
- Press **[ENTER]** to store the new value (**[CANCEL]** restores the original value).
- Press ▼ to return to NET weighing.

Note: In the alarm display/setting mode, the display will automatically revert to net weight if no button is pressed for 30 seconds. If **[ENTER]** wasn't pressed, the old alarm value will be restored.

ZERO
This is the manual zero function. Pressing **[ZERO]** for 1 second zeros the display, so long as the weight displayed is within 1000kg of the original calibrated zero. If autozero is enabled (A2Ero 1), zeroing takes place automatically on power up (sidelights flashed). This is NOT 'zero calibration' which should really be a 'once-only' operation. What it does is compensate for zero drifts from the original calibration due to dirt build-up, body wear, site level and other external factors.

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AUTOZERO
The 'A2Ero' function attempts a zero net weight display on powering up when the body is empty. This is similar to pressing the **[ZERO]** button, and means that a zero can be forced without opening the weigher cover by simply flashing the sidelights. Although manual **[ZERO]** allows a range of +/-1000kg from originally calibrated zero, autozeroing is only allowed +/-200kg of the previous 'zero'. In addition, it is only attempted between 20 and 30 seconds after switching on (sidelight 'flash'). It will fail if the body isn't stable ('motion') or if displaying more than 200kg.
This is off by default, but can be changed:
- Press and hold **[ENTER]** until SEtUP appears.
- Press ▼ until A2Ero 0 or A2Ero 1 is displayed.
- Press **[EDIT]** and use the ▼ button to 'toggle' to 0 for disabled, 1 for enabled.
- Press **[ENTER]**.
- Press ▲ until SEtUP is displayed.
- Press **[ENTER]** to return to NET weighing.

Note: If the weigher is inadvertently turned on (sidelights flashed) before the body is fully raised into the 'weighing' position, an incorrect zero weight may be acquired. This will obviously affect the displayed loaded weight. If bad repeatability is experienced, try turning off the autozero function and always ensure a 'good' zero is displayed before loading commences.

Overview of SEtUP menu and System Calibration

This is a description of the SEtUP 'menu' functions, and initial calibration instructions. The system is calibrated at zero (body empty) in the factory, and at span (near full load) by the driver during first use. Re-calibration should **only** be performed when a definite and consistent weighing error is experienced, or if electronics or load cells have been replaced. To access the SEtUP menu mode, press and hold **[ENTER]** from the usual net weighing mode for 1 second.

In the menu mode, ▼ ▲ ◄ navigate through the various parameters and pressing **[EDIT]** displays and allows editing of certain parameter values. Edit mode is signified by a flashing digit. The digit to be modified (flashing) can be moved with the ◄ button, and modified by the ▼ ▲ buttons.
After completion of editing, the new value is accepted by pressing **[ENTER]**, or aborted by pressing **[CANCEL]**.

SEtUP
This is the entry and exit point of the menu. Pressing **[ENTER]**, **[CANCEL]** or **[EDIT]** will return the display to net weighing. The ▼ ▲ buttons navigate to the menu parameters.

A2Ero 1
The 'Autozero' function forces a zero net weight display on powering up when the body is empty. This is similar to pressing the **[ZERO]** button, and means that a zero can be forced without opening the weigher cover, by simply flashing the sidelights. Display autozeroing is limited to within 200kg of the previous 'zero', so that zeroing will only take place when the body is empty. Setting to A2Ero 0 disables the autozero.

CoUnTbY
By default, the weigher 'counts by' 20kg steps. This can be changed to 10, 20, 50, 100, 200 or 500kg steps.

2Ero Calibration
This is for initial zero calibration, and should not be repeated unless there is clear evidence of a permanent zero (empty body) weight shift, or weigher parts have been replaced. The normal 'Autozero' or manual **[ZERO]** pushbutton will take care of the usual minor drifts incurred with age.
Ensure the trailer body is raised (30cm/12") and truly empty ('zero weight') and press **[EDIT]**. SUrE? is displayed.
Pressing **[ENTER]** starts zero acquisition. (**[CANCEL]** will abort.).
CAL is displayed with a flashing 'o' during calibration, which may take up to 10 seconds.
'9ood' indicates success, and the display returns to the 2Ero display.
Make a note of the new zero factor, as displayed in 2EroFCT, described below.

SPAn Calibration
This is for initial span (full weight) calibration, and should not be repeated unless there is clear evidence of a repeatable weighing error, or weigher parts have been replaced.
Load the trailer with a known weight, or fill and use a weighbridge to determine the net weight (ideally, near maximum gross weight, but anything over half should be adequate).
Ensure the body is raised to the weighing position.
Press **[EDIT]** and edit in the reported payload using the ▼ ▲ ◄ buttons.
Press **[ENTER]** to start span acquisition. (**[CANCEL]** will abort.)
CAL is displayed with a flashing 'o'.
'9ood' is displayed on successful completion. (Or an error code if it fails.)
The display returns to SPAn
Make a note of the new calibration factor, as displayed in CALFACT, described below.

2EroFCT
Pressing **[EDIT]** displays the zero (empty) calibration factor used internally. This should be noted after a zero calibration.
As can be seen, it is possible to modify this value (the flashing digit indicates it's in 'edit' mode).
However, only edit this value if instructed to do so by an **Mx OnBoard** technician or agent. Use the **[CANCEL]** button to exit.

CALFACT
Pressing **[EDIT]** displays the span (full load) calibration factor used internally. This should be noted after a span calibration.
As can be seen, it is possible to modify this value (the flashing digit indicates it's in 'edit' mode).
However, only edit this value if instructed to do so by an **Mx OnBoard** technician or agent. Use the **[CANCEL]** button to exit.

bLUTUTH
This parameter is used to display the unique Bluetooth 'address' of the currently connected Remote Display (if option applicable). The address is 7 digits long and may consist of numbers and letters.
It is set to 0000000 if the Bluetooth option is unused (default). If it is edited to 0000001, a new Bluetooth Remote will be searched for on return to normal weighing. (The function is more fully described in the Bluetooth Remote option instructions.)

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CELL oP
This is used to display the 'raw' load cell output in 'millivolts per volt' (mV/V). It is a valuable troubleshooting tool.
Press **[ENTER]** to display (the flashing bars in the left digit indicate mV/V display mode).
An empty standard Fruehauf 'bathtub' body gives a cell output of around 0.0500mV/V (0.0400 to 0.0700). With a 30 tonne load, expect to see around 0.6500mV/V.
Any button exits from this mode.

Bluetooth Radio Remote Cab Display Option

Introduction
This option allows remote display of weight on a battery powered portable module (the 'Remote'). It is a simple duplicate display of the net weight shown on the normal chassis indicator, and has no control buttons. The chassis display (the 'Base') must be Bluetooth equipped and is a special option.

Operation
The Remote is switched on by pressing the power button on the left hand side panel. This button requires a press of at least half a second to switch the unit on. This is to prevent accidental powering on with consequent battery drain. (If the button is held depressed, it enters a diagnostic mode (see 'Troubleshooting', below).

The display will initially show the message 'SIGnALP', indicating no radio link established with the Base. If the link remains down, the 'SIGnALP' message is replaced with two flashing decimal points (DPs) to conserve battery power, whilst still indicating the Remote is powered up.

The 'SIGnALP' message (or flashing DPs) will also be displayed whilst the Base is in SETUP mode, as Bluetooth transmission is stopped in this mode.

If the Base is now switched on (press a button or flash trailer running lights), the Bluetooth radio link will be established after a few seconds and the net weight will be displayed on the Remote.

Switching off is by pressing the power button on the Remote a second time.

The Remote will automatically switch itself off after 10 minutes, or 5 minutes if no radio link is established with a Base. It will also switch off if its internal battery voltage drops below a safe limit (low charge). (Note: Later models will remain on until the base unit powers off.)

It is a good idea to switch on the Remote around the same time as the Base is powered on (sidelights flashed). If the Base is turned on more than 30 seconds before the remote, it will attempt to search for a 'new' Remote (as described below), and this may result in a long wait for initial connection.

Swapping Remotes
Only one Remote may 'talk' with one Base at any one time. When a Bluetooth-enabled Base powers up, it will try to link with the Remote it was previously talking to. If that Remote is in range and switched on, a link is made in seconds, and weight data is transmitted.

If the previous Remote is not found within 30 seconds, a search ('discover') for any **Mx OnBoard** Remote is initiated. The first one found is used to form a new link. Around 40 seconds after switch-on, a brief display of 'dISC n' is made, where 'n' is the number of Bluetooth devices discovered (this will include any Bluetooth – even a mobile phone). The search then continues to find only a **Mx** Remote device. If a new Remote cannot be detected after a further 30 seconds, the cycle is stopped and connection with the original Remote is attempted continuously.

Note that once a successful link has been made, the search cycle is not re-started. If the link is temporarily lost, the Base will only try to re-connect with the current Remote. To initiate a search, the Base must be turned off and on again.

To link to a 'new' Remote:
Power up the Base with the 'new' Remote nearby, and switched on. Ensure there are no other Remotes (and particularly the 'old' linked Remote) switched on nearby. This will take around a minute, with no indication of progress until the Remote starts to show net weight. Note that the Remote may power itself down after five minutes from first switching it on. If a new Remote is not discovered within around 1 minute, switch the Base off then on to re-initiate a search. Alternatively, enter SEtUP > bLUEtH and set the address to '000000 1', to initiate a continuous search for the new Remote.

Battery Charging
The Remote's internal rechargeable battery is 'trickle-charged' from the vehicle's lighter socket, using the supplied charging lead. The battery cannot be harmed by overcharging. The LED indicator next to the Remote's charging socket will illuminate whenever charging is taking place. The Remote is designed to be left connected to the charging socket at all times when it is not in use. The current draw from the vehicle battery will not flatten it if left connected overnight, or longer. The lighter socket can be 12 or 24v supply. If the Remote's battery becomes completely discharged, it may take several hours of charging before it can be used for more than a few minutes. If it turns off prematurely, suspect a flat battery. It needs at least an hour on charge for every 10 minutes of use.

Range
The **Mx OnBoard** system uses powerful Class 1 Bluetooth modules with a specified range up to 100m. This maximum is greatly affected by terrain and obstructions such as other vehicles and buildings; the signals are not able to penetrate most solid materials. The signals are, however, easily reflected and this is one way they achieve good penetration into the cab; they pass through the windows after reflection around the trailer chassis and even off the ground. The range should be close to maximum in 'line-of-sight' from the offside of the vehicle, but will obviously reduce, and even disappear altogether if a large object comes between Base and Remote.
When establishing a link after switch on, a maximum range of around 10 metres should be observed.

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Troubleshooting
When there is no link with a Base, the display will show 'SIGnALP' for two seconds. It then drops back to a power saving mode of two decimal points on the display 'toggling' on and off.
If the Remote remains in this mode for more than two minutes with an operational Base nearby, it is likely that the Base is either already connected to another Remote, has Bluetooth mode disabled, is not Bluetooth equipped, is out of range, or there is something interfering with the radio signal between Base and Remote.
Ensure the Base is known to be Bluetooth equipped and move the Remote close by and power both off and on again*.
If this still fails to initiate a link after a couple of minutes, enter 'SEtUP' > 'bLUEtH' on the Base, and check for a valid Bluetooth address.
If the address is set to '000000', Bluetooth has been disabled. Set '000000 1' to initiate a search when the Base is returned to normal weighing.
If there is a Bluetooth address in the Base (indicated by 7 numbers and/or letters), see if it corresponds with that in the Remote. Press and hold the Remote's power button to force the diagnostic mode – it will show the current software release, then perform a display segment test, then display a 7-digit address which should be the same as the one displayed in the Base's bLUEtH parameter.
(If the Remote shows a blank address, keep the power button pressed until 'InItIAL' is displayed – then try the diagnostic step again.)
If all of the above checks out, it may be a radio signal propagation problem. Perhaps the Base and Remote are too far apart, a large object is blocking the signal path, or strong external radio interference is present. This may happen if parked near a radio transmitting antenna or source of strong electrical interference, such as welding or large electric motors/control gear. It is possible, but fairly unlikely, that a mobile phone, CB or 'walkie-talkie' could be sufficient to temporarily upset the Bluetooth link.
*If the site is one where the driver is not permitted to leave the cab, try holding the remote out of the window, in 'view' of the Base on the chassis until a successful link is achieved. It should then be possible to bring the Remote back inside and still maintain the link.

Remote Diagnostic Function
The Remote has a diagnostic function in which, if the power button is held pressed when switching on, the display will step through a series of self-tests. These are:

a. Display firmware (internal software programme) version number – e.g. dF6_303.
b. Perform a sequence of segment tests.
c. Display Bluetooth address lower 7 digits (as used by the Base in the 'bLUEtH' parameter).
d. Display Bluetooth address upper 5 digits (giving a full 12-digit address).
e. Force a re-initialisation of the Bluetooth module – 'InItIAL'.

Note that if the module was not previously initialised, steps c. and d. above will show blanks. After step e., the address should show properly when the sequence is repeated. A reported Bluetooth address is a good indication the Bluetooth module is working correctly.