HANWELL

IM4276-MS1003

User Manual

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Contents

Document History

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Issue No.	Issue Date	Changes	By
1	12.07.09	Initial release	MH
2	22.09.09	Added colour coded table for connections	MH
3	15.08.13	Format updates + addition of analogue alarm function	LJ/DR

IM4276-MS1003 User manual

This document details how to install and configure the **Hanwell MS1003** cards.

The MS1003-AM duplicator card produces an accurate 12-bit output of 2 - 10V or 4.-.20mA directly from a Hanwell 4000 or 5000 series dual channel radio transmitter. Each card has 4 outputs corresponding to two consecutive sensor ID's

All linearization is done in software, resulting in a highly cost effective wire-free method of taking measurements in difficult areas.

The MS1003-RM-AA relay card when used in conjunction with most dual channel 4000 and 5000 series transmitters can remotely create alarms.

1 General Notes

1.1 General Characteristics MS1003-AM Card

The MS1003-AM outputs are set to 0 (V or mA) on power up or if a radio signal is not received for a period of 2/12minutes (nominal, selectable). Otherwise the output values are latched between radio transmissions.

LED's on each card indicate successful transmissions, low batteries and elapsed time warnings. Normally both LEDS for a channel will be on. The Rx Led will dim briefly every time a valid signal is received and the Battery OK LED will go out if a low battery warning is received. Both LED's will go out to indicate an elapsed warning (no recent signal).

The MS1003-AM works from a 12V regulated supply.

The MS1003-AM is readily calibrated in situ by the user.

1.2 General Characteristics MS1003-RM-AA Card

The LED's on the MS1003-RM-AA are set to on, on power up. If a radio signal is not received for a period of 2/12minutes (nominal, selectable) the LED's go out and the relay changes state. Otherwise the relays are latched between radio transmissions.

LED's on each card indicate the status of the Alarm and elapsed time warnings. Both LEDS for each channel will be on when the system is not in alarm. Both LED's will go out to indicate an elapsed warning (no recent signal).

The MS1003-RM-AA works from a 12V regulated supply.

The MS1003-RM-AA does not require calibration.

2 Connections

2.1 MS1003-xx-xx connections

All connections to the MS1003-AM and MS1003-RM-AA are via connectors either on the base or the on the top of the assembly.

The MS1003-xx-xx cards are specifically designed to be stacked together to facilitate larger installations where the power and receiver connections are “bussed” together.

The MS1003-AM is designed to work with the following Hanwell Instruments receivers:-

- ❑ RX-433.920
- ❑ RX-434.075
- ❑ RX-457.600 (US Only)

The connections to the MS1003-xx-xx are as follows:

Pin No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Signal Name	N/C	N/C	+12V Supply	+12V to Radio Module	N/C	N/C	GND from Supply	GND to Radio Module	Data from Radio Module	N/C

The standard cable colouring for the Hanwell RX series of receiver is as follows:-

Receiver Connection (JP1)	**Hanwell Supplied Wire Colour**	**Signal name**	**MS1003-xx-xx Connection**
Pin 1	Green	GND	8
Pin 2	Blue	Signal Strength	N/C
Pin 3	Yellow	RX data	9
Pin 4	Red	RX power	4

3 Configuring MS1003-Am cards

3.1 Configuration

In order to set up a system you will need to do the following-

- Mount 1 or more (up to 100) MS1003-AM cards on a DIN rail.
- Connect one or more 12VDC supply as shown in the table above.
  NOTE: - Each MS1003-AM card consumes approx 120mA for each 4-20mA card and 20mA for each 2-10V card, therefore ensure that the cabling and the power supply is rated for the maximum current drawn.
- Connect a receiver to the MS1003-AM as shown in the table above.
- Set the card ID's to 1 onwards as required, in order.
  NOTE: All cards must have a unique ID. The card ID's are set from 1..31 using on the first 5 switches (in binary format) The other 3 switches have functions as follows.
- Switch 6 ON = elapsed warning for first channel only, OFF = elapsed warning on both channels.
- Switch 7 ON = 2 minutes elapsed warning, OFF = 12 minutes elapsed warning (nominal values).
- Switch 8 ON = Calibrate mode, OFF = Normal mode (see below).
- Run the USB Sensor Lineariser utility (Hanwell Part No W253 or download from our website), this will enable you to set the following parameters:-
  - Type of Output (4 to 20mA or 2 to 10V)
  - ID and channel pair of output card
  - The calibration details (as supplied with the MS1000 card)
  - The physical values to which full range will correspond (e.g. 0 - 1200C or 20 - 80%RH)
  - The transmit interval required. See section 6

3.2 Using USB Sensor Lineariser

Referring to the diagrams below:-

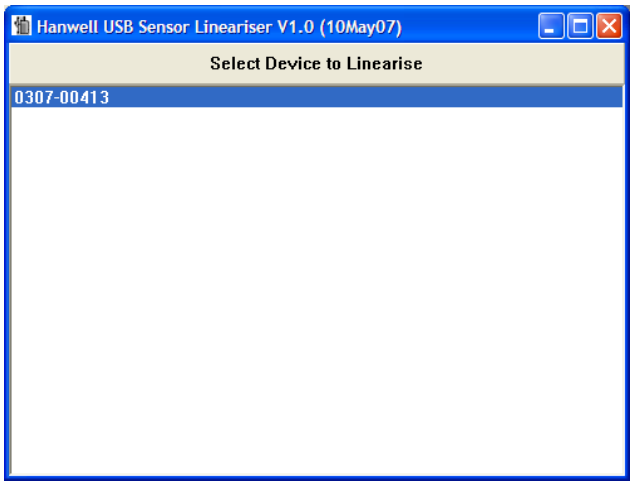


Fig 2

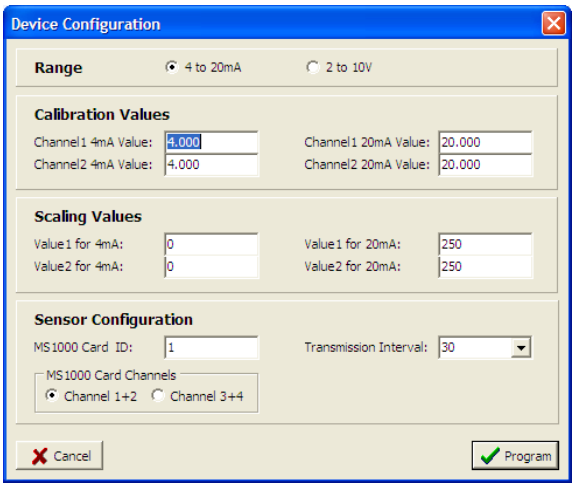


Fig 3

- Run the software, you will be presented with a screen similar to that shown in Fig 2; remove the battery from the sensor and plug in the USB lead. You will get a number come up that is of a similar format to that shown in Fig 2; this is the sensors serial number. By clicking on this number the screen shown in Fig 3 will come up.

- Fig 3 shows the config screen. Note its use should be self-explanatory. Select the Range first, and then enter all the calibration details, if you do not have these to hand or they have been mislaid, please refer to section 4 for details on how to obtain them yourself.

- When the details are correct click on the “Program” button to save these settings into the Sensor.
  NOTE: The software will calculate the sensor ID and the corresponding gain and offsets that should be used if you are also monitoring the data via the RadioLog system (see section 5). Note these values if required, otherwise ignore them.

- Restart the unit by refitting the battery.

- Verify that the correct outputs appear on the MS1000 card

4 Configuring MS1003-RM-AA cards

4.1 Configuration

In order to set up a system you will need to do the following-

- Mount 1 or more (up to 100) MS1003-RM-AA cards on a DIN rail.
- Connect one or more 12VDC supply as shown in section 2.1.
  NOTE: - Each MS1003-RM card consumes approximately 110mA when all the LED's are on, therefore ensure that the cabling and the power supply is rated for the maximum current drawn.
- Connect a receiver to the MS1003-AM as shown in section 2.1.
- Set the card ID's to 1 onwards as required, in order.
  NOTE: All cards must have a unique ID. The card ID's are set from 1..31 using on the first 5 switches (in binary format) The other 3 switches have functions as follows.
- Switch 6 ON = elapsed warning for first channel only, OFF = elapsed warning on both channels.
- Switch 7 ON = 2 minutes elapsed warning, OFF = 12 minutes elapsed warning (nominal values).
- Run the USB Sensor Lineariser utility (Hanwell Part No W253 or download from our website), this will enable you to set the following parameters:-
  - Upper and lower alarm thresholds*
  - ID and channel pair of output card
  - The transmit interval required. See section 6

*When entering alarm levels these must be entered in the same units that the RL5001 transmitter has been calibrated to. i.e. for an RL5001 calibrated 0 to 9,999 mV the alarm level should be entered in mV.

Run the software, you will be presented with a screen similar to that shown in Fig **4**; remove the battery from the sensor and plug in the USB lead. You will get a number come up that is of a similar format to that shown in Fig **5**; this is the sensors serial number. By clicking on this number the screen shown in Fig 5 will come up.

Figure 4

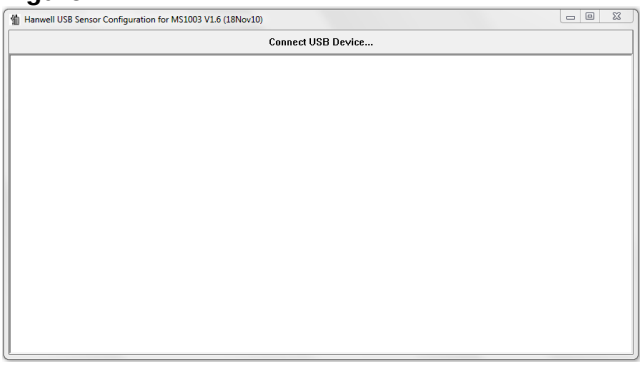


Figure 5

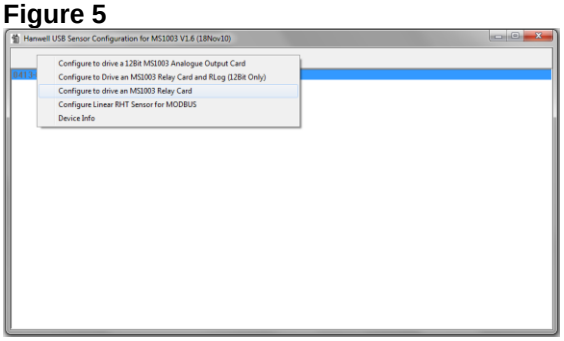
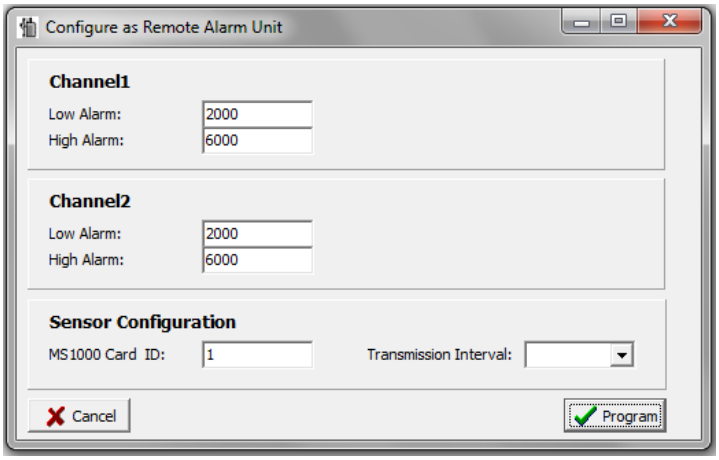


Fig 6 shows the config screen. Note its use should be self-explanatory. Select the alarm settings ensuring that this is done using the same scale and units as the RL5001 transmitter. Enter the MS1000 card ID and the Transmission Interval, see section 7 for further details.

Figure 6



When the details are correct click on the “Program” button to save these settings into the Sensor.

Restart the unit by refitting the battery.

Verify correct alarm operation on the MS1000 card. Note, it takes two consecutive readings to go into alarm and one reading to come out of alarm.

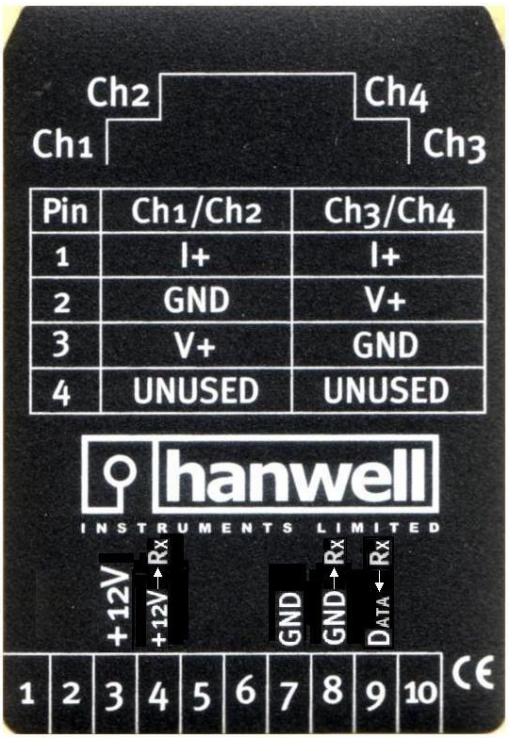
5 Calibrating the System (AM cards only)

The sensors are calibrated in the normal way, either by the user with the RadioLog system or by the factory (see the RadioLog manual)

The cards are calibrated by first putting the card into test mode (Switch 8 ON)

In this mode the card will continually output a nominal 4mA (2V) and then 20mA (10V) with an interval of several seconds between each cycle.

Connect a Digital Volt Meter to the output terminals of the MS1003-AM (refer to the diagram on the side of the MS1003-AM and as shown below). For 4-20mA connect between I+ and GND and for 2-10V between V+ and GND.



Measure and record the actual output values as shown on the DVM for each channel These values are those that will be entered in the calibration section of the lineariser program.

Ensure that you return switch 8 to the off position when this calibration process is completed.

6 Viewing the Data in RadioLog (AM cards only)

The lineariser will have changed the transmission format of the sensor to emulate a LINEAR sensor (NOT the original type). To view the data in parallel with the duplicator function you will need to manually create a Linear sensor of the correct ID, with the correct calibration values and units.

NOTE: You **MUST NOT** use the RadioLog 8 'SYNC' function with a sensor that has been programmed with the USB Sensor Lineariser software

To restore the sensor to its standard transmission format you will need to use the 'RECALIBRATE' function in RadioLog8 (version 8.3.3 or later) having manually entered the original calibration data in the properties dialog of a sensor of the correct type.

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7 Transmission Rate Limitations

The transmission rate is selectable between 5 seconds and 600 seconds. Care must be taken when this is set.

For example; if you have a system with 200 sensors installed on it, then to have a transmission interval of 5 seconds would be impractical.

That would mean that 200 sensors would each be transmitting at 5 second intervals. This would lead to a large number of overlapping signals and the system would not work.

For a large system of this type we would recommend utilizing the maximum interval of 300 seconds or 5 minutes.

The table below should be used for reference, and represents the minimum time interval for transmission based upon the number of sensors in the system.

It must also be taken into account that the shorter the transmission interval the shorter the battery life on the telemetry unit.

As a rule of thumb a transmission interval of 60 seconds will give a battery life of just over one year. Slower transmission rates will increase the battery life.

Transmission interval	10	15	30	60	90
Number of units	Up to 10	Up to 15	Up to 30	Up to 50	Up to 70
Transmission interval	120	150	180	240	300
Number of units	Up to 80	Up to 100	Up to 140	Up to 180	Up to 200