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MQx Specification

The MQx system is available in a number of configurations on both mobile bands and cellular IoT bands.

The inputs can be configured via the user interface, over the air, as 4x 0-36VDC analogue or digital (on/off) type inputs for use with volt free contacts. In the digital configuration the input sources a weak pull up current (<1mA) at 2.8V.

Additionally, the inputs may be configured as Wiegand inputs for use with security tag and keypad readers.

The inputs can also be configured as low data rate UART inputs. Please note this requires a customised sub-PCB.

The MQX PCB features a volt-free relay output capable of handling 50VDC up to 2A.

The MQX has an additional open collector output capable of sinking up to 100mA.
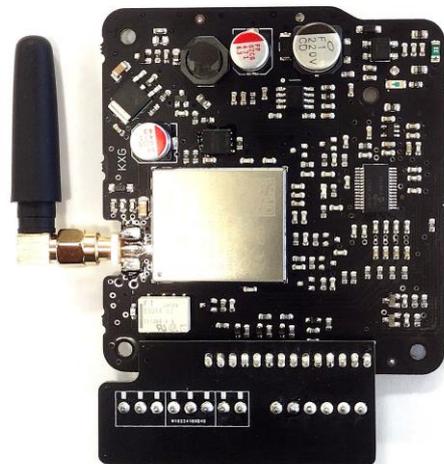
MQ4		**MQ5**	
Cellular Technology	4G LTE Cat-1, 2G GSM	5G NB-IoT & Cat-M1, 2G GPRS	
Aerial	SMA Female Penta-Band	SMA Female Penta-Band	
Power Supply	12-24VDC/AC 20mA-100mA	12-24VDCAC 20mA-100mA	
Reader Interface	Wiegand 5V	Wiegand 5V	
Exit/Fire Inputs	NO/NC/GND	NO/NC/GND	
Output Relay	NO/NC/COM 2A 50V Max.	NO/NC/COM 2A 50V Max.	
Output Transistor	100mA 50V max.	100mA 50V max.	
Timers	7-day, 2 events per day	7-day, 2 events per day	
Keycode Length	1-7 digits	1-7 digits	
Tag ID	7 characters	7 characters	

Alarm Wiring Guide MQx Alarm Dialler (IoT)
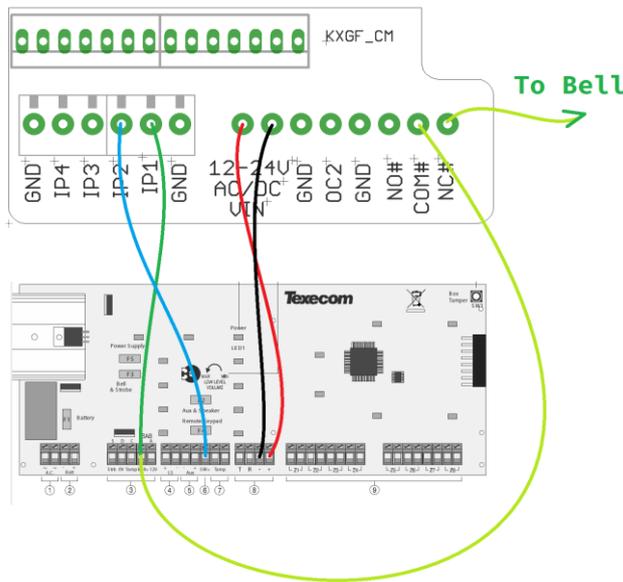
Figure 1. Typical Alarm Wiring Diagram

Power should be derived from the alarm panel auxiliary output. Typically, these will be marked +, +VE, +12V and 0V. The +12V terminal should be connected to the AC/DC VIN terminals as shown above. The 0V terminal should be connected to the GND terminal on the alarm dialler.

The Bell or -V terminal on the alarm panel should be connected to the IP1 terminal on the alarm dialler. If a SET terminal is available, connect this to IP2. On the Texecom panel shown the terminal is marked SW+.

If the set/unset messages are inverted, we recommend going to the Live Screen for your device and simply reversing the messages here.
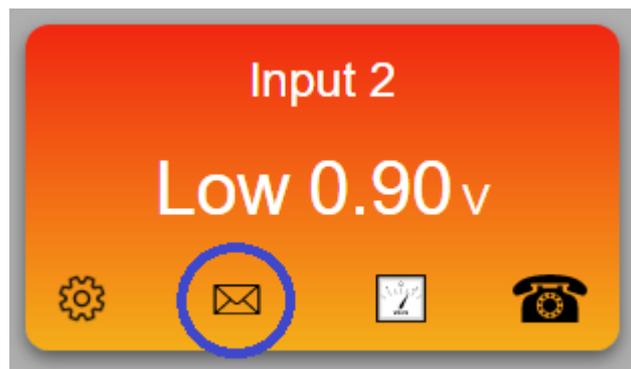
Figure 2. IP2 Message Edit Button

If intruder alarm allows a zone to be configured as a keyswitch input, then connect this to the relay terminals NC & COM. This will require some programming to be performed on the alarm panel. Please refer to your panel manufacturer's installation manual.

To silence an alarm remotely, the bell -ve connection may be routed through the output relay NC and COM terminals as shown above. Activating the output relay from the Live Screen will silence the bell. This can also be achieved by sending the on and off commands to the diallier SMS programming number.

We do not recommend remote control of alarm panels. However, we recommend using a zone as a keyswitch input instead of wiring the bell -ve terminal through the dialler output relay where possible.

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IIoT Monitoring and Control System

The Industrial IoT System allows monitoring and control of your industrial control systems remotely via SMS, Web or call, using the 4G and 5G mobile phone networks. The eSIM provides connectivity to multiple networks in over 100 countries.

Each input can be used to send SMS and email messages and initiate a Text-to-Speech voice call. Inputs can be used to operate outputs on the local device and also on remote devices creating a long-range switch connection. Output relays can switch currents up to 1A at 50V.

Input Configuration
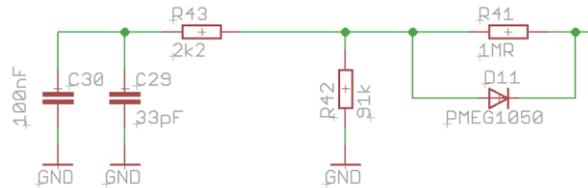
Input Reference Circuit (1.091MR Impedance)

Digital Mode

Each input can be configured as an analogue or digital input. The mode is selected using the settings button on the input card on the Live Screen (circled in orange below).

Input Settings Button

The Input Settings modal features the Digital/not Analogue checkbox. To switch the input over to digital, ensure this checkbox is checked and click the Save button immediately below the checkbox. **The device must be powered on and registered on the network for the change to the input to be made.**

Digital inputs have 2 states; High and Low and are designed to be connected to a volt free switch or relay. Setting the input to digital sets the device to source a small current through the input channel. This allows it to sense when a switch contact has been connected to the GND terminal. This corresponds to the 'Low' state. When the input is open circuit it is considered to be in the 'High' state.
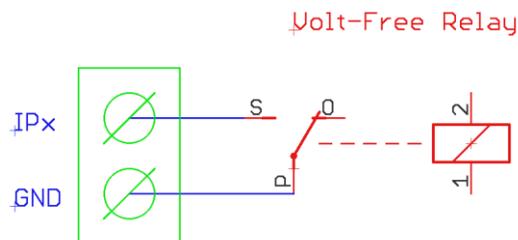
Setting the input to digital will overwrite the upper and lower threshold voltages to 20V and 10V respectively. The source voltage will be 2.8V maximum. **In digital mode the high and low voltage thresholds are meaningless and should not be adjusted!!**

Variable Voltage Source
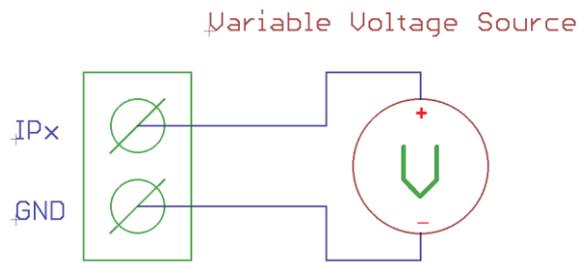
To switch to analogue mode the 'Digital/not Analogue' checkbox should be unchecked and the 'Save' button should be clicked only when the device is powered up and registered on the network.
In analogue mode there are 3 states.
Under the Low Voltage Threshold value, the input is considered 'Low'
Above the 'High Voltage Threshold' value the input is considered 'High'
A voltage between the high and low voltage is regarded as the 'idle' voltage. There should be a difference between the high and low threshold voltages of at least 2x the input hysteresis voltage which is typically 0.5V. Hence, **when setting the upper and lower threshold voltages, ensure they are at least 1V apart.**

The inputs can measure a voltage from 0V to 36V. By default, there is 0.5V of hysteresis on each input. This means the input will not retrigger until the voltage is more than 0.5V away from the threshold voltage. This stops a minor voltage fluctuation repeatedly triggering the input.

Outputs

Standard DIN rail IIoT systems feature 2 mechanical output relays with both 'Normally Open' and 'Normally Closed' terminals. We recommend a maximum terminal voltage of 50V with a current up to 2A.

The relays can be controlled at any time via the 'Live Screen' and can also be operated by SMS or dialling. Please see the supplementary 'SMS Programming and Operation' Quick Start Guide for SMS control.

To get or change the telephone number to dial for each output, click the telephone icon on the output card. This number can be changed to any one of our international telephone numbers. Each relay can have its own unique telephone number.

Click the telephone to change the number

If your number is present in two or more IoT devices, then you should select unique numbers for all relays as ringing this number will operate all relays where you phone number is valid. This may or may not be desirable.

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Programming: User Enrolment

When first powered up, the signal LED (SIG) will initially flash. This will light permanently once a connection has been established. The SIG LED may continue to flash at a lower rate to display the unit is getting a poor signal. So long as the LED is not flashing the system will be operational.

The 5G model may take 5-10 minutes to connect to the network. These units are not intended to be moved very often and save power by storing network settings for the local base stations instead of loading them every time it is powered up. This is why they take time start up. They require extra synchronisation with the network to connect after being moved.

If you have access to a smart phone with QR code reader, you can get access directly to the Live Screen and Users page by scanning the **Live Screen QR code** *(be aware we also include the 'View Screen' QR code label which gives unauthorised viewers read-only access)* which contains a secret encrypted key. To use the QR code, scan the image and navigate to the Users page to add your number and email address. We recommend you add both your mobile number and email address.

To add users without the QR code, the admin user must enrol himself/herself on the unit by visiting the following address (or scanning the **Enrol QR code**):
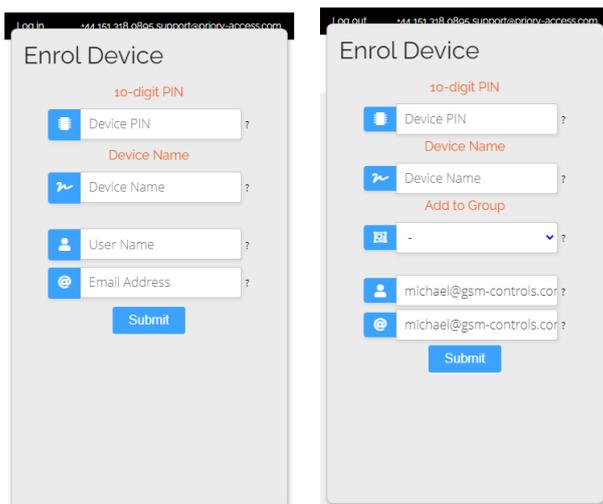
https://iot-portal.com/enrol

Enter your name, your email address and click 'Enrol'. This will take you to the Live Screen for your device.
You will receive an email with a link to the Live Screen. **If this is the first unit you have enrolled, you will receive a link in order to set a password on the portal. We recommend you use this link immediately before it expires.**

Ensure you log into https://iot-portal.com and not https://www.priory-access.com portal for IIoT equipment including the DIN rail mount and MQ5 products!
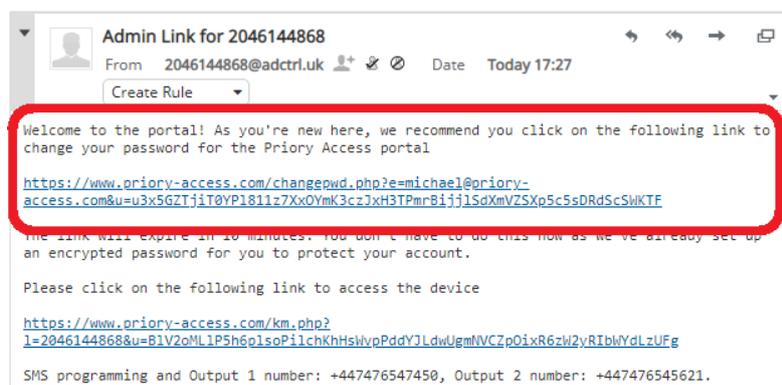
It is possible to program the dialler using SMS text messages or via the online portal.
To program the dialler via SMS, please see the "SMS Programming and Operation" Quick Start Guide.

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Users To access the telephone numbers and email addresses click the 'Users' button.

The 'Phone' column will be highlighted in red to indicate you should add your number by clicking the 'Amend' button. Please check your email address carefully for errors!

If you add yourself as a 'Master User' you will be able to recover your account if there is a problem with your email address.

A Text number is sent an SMS text message when the inputs are triggered

A Call number is dialled with an input is triggered. During the call we will read out the message or can play an mp3 file
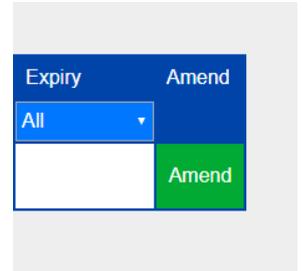
To add more users, click the 'New User' button at the top of the page. When adding a new user each column is optional. There is no need to add a number and email address for each user. Leaving a column blank is generally OK.

If you would like the user to have Full Access to all settings, then select 'Full Access' from the drop-down menu. Open/Close allows the user access to the 'Open Gate' page and 'None' removes all access without deleting the user.

Events

You can tailor specific email events for each user by amending the 'Events' box. There are some preset events for each system, such as, 'Alarm', 'Set/Unset'. To customise the email events the corresponding event number is required to be entered

Input 1 Low 40, Input 1 High 41
Input 2 Low 42, Input 2 High 43

Expiry

After the expiry date, the user will be deleted.

Further help and information is available at: https://iot-portal.com

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16:49

Each section has a help pop-up box.

Amend User
Click 'Help' for further information

User name should be entered here

User (Help)
Andrew

For door readers with a keypad, optionally enter a keypad code here

If you would like the code sent to the user, check this checkbox and fill in the phone number below.

Access Control Media

Keypad Code (Help)
12345

☐ Send code to user in SMS

The tag ID is entered here
If you clicked on the tag ID on the Live Screen it will be pre-filled.
There are multiple ways of obtaining a tag ID:

Tag Code (Help)
A18CD846

☐ Void Tag

☐ Mail My Tag

Save

To disable the user's access but retain their tag ID (recommended), click void tag

- Priory Tag label
- Using NFC Tools
- Obtain from door reader
- Obtain from USB reader

Mail My Tag – clicking this box pre-fills the Tag ID box. Once the save button is pressed the administrator is directed to an address form for the mailing address of the user.

Phone Settings

Phone (Help)	Order (Optional)

Type (Help)
Admin

The phone number can be added for a general user so they can receive their keypad code via SMS (Type should be 'User').
Admin users should add their number for important information from the controller such as void tag attempts or the controller needs attention.

Email addresses should be added for Admin users so they can be sent a link to the door controller or log in to the group view via the iot-portal.com main page.

Admin users should have 'Full Access' selected from the permission drop down box.

If invalid/void tag events require email notification, select 'Full' from the email notifications drop down box.

Email Details

Email (Help)

Email Notifications (Help)

Permission (Help)
Full Access

Optional Time Settings

Start Time (Help)

End Time (Help)

Each user can have time restrictions placed on their access for each door.
Daily start and end times can be specified in this section along with the ability to restrict access to specified days.
An expiry date may be added to ensure access is automatically removed for this user on the specified date.

When either 'Save' button is pressed, the cloud database is instantly updated. An attempt is made to contact the controller if it is available. If the controller is offline an attempt will be made at a later date until the data is confirmed.

Weekdays (Help)

☑S ☑M ☑T ☑W ☑T ☑F ☑S

Expiry Date (Help)

☐None

Save   Cancel

New Key   Delete

Removes user from database

The 'New Key' button generates a new secure link for an Admin user if the original has been unintentionally shared

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SMS Programming and Operation

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Whilst on-site it is often easier to program and operate the system via SMS. Both online and SMS programming/operation are available and can be used in conjunction with each other. There is a small charge made against your PAYG balance for receiving SMS messages. This is typically £0.01. Please check your 'Live Screen' for per unit pricing. The optional reply is charged at your standard SMS rate.

To enrol your phone via SMS you will need the 10-digit PIN number for your device shown above. Please send the following SMS to +44 7429 750 090:

Enrol <pin>

For example, if your PIN is 0123456789 then you should send:

Enrol 0123456789

The system will reply to your message with your Output 1 telephone number. This should be stored as your SMS programming telephone number. It is also the number for operating Output 1 by SMS and dial-in.

Output 2 has its own telephone number which is also contained in the message and can be found by sending the following message to your new Output 1/SMS programming number (obtained in the previous step):

Output 2

To operate the output relay on your unit simply send the following commands via SMS to the corresponding telephone number

On	…active the output indefinitely
Open	…active the output indefinitely
On 10	…active the output for 10 seconds
On 5m	…activate the output for 5 minutes
Close	…deactivate the output
Off	…deactivate the output

Please note, it does **not** matter whether the message Is in **UPPER CASE, lower case or a MiXtUrE** of both upper and lower case.

To **add** dial-to-open number the ADD command is used as follows:

Add 07123456789.　　　…adds 07123456789

To remove all occurrences of a number:

Remove 07123456789.　　　…removes 07123456789 (all occurrences)

To add numbers to call and text when the alarm sounds/inputs are triggered send the following commands:

Call 07123456789　　　…calls 07123456789 when the inputs are triggered
Text 07123456789　　　…text message 07123456789 when the inputs are triggered

To add a master number (who can administer other users) send the following SMS:

Master 07123456789　　　…gives 07123456789 admin rights to the unit (along with the original enroller)

There is no limit to how many numbers of any variety that can be stored. We recommend only 1 or 2 master numbers as they are contacted when there is a problem or the accounts needs topping up.

To get a list of numbers associated with this unit send the following SMS

List　　　…returns a list of all of the numbers in the database

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To access the Live Screen on a unit enrolled by SMS, send the following message:

Get link   …returns a clickable link to the 'Live Screen'

To check you PAYG Balance send the following SMS:

Balance   …returns your current balance (in GBP)

To check your current incoming and outgoing call charges send the following:

Charges   …return incoming and outgoing SMS and Call charges

List of Commands

	Additional Instructions			
Add	*<number>*			Adds a 'dial-to-open' number
Balance				Displays PAYG Balance
Call	*<number>*			Add number to call when input triggered
Charges				Displays usage charges
Close				Deactivates relay corresponding to number
CSQ				Returns signal strength out of 31
Enrol	*<pin number>*			Enrols a new phone
Get Link				Returns a clickable link for Live Screen
List				Returns numbers in database
Master	*<number>*			Adds admin phone number
On		*<seconds>*	*<minutes>m*	Activates relay corresponding to number
Open		*<seconds>*	*<minutes>m*	Activates relay corresponding to number
Output	*<output>*			Displays output information
Pulse				Pulses relay corresponding to number
Remove	*<number>*			Removes a number from the database
Relay Time	*<seconds>*	*<minutes>m*		Changes relay pulse time (dial-to-open)
Reply	***On***	*Off*		Switches SMS confirmation on and off
Signal				Returns signal strength out of 31
Status				Input and Output states

Further help and information is available at: https://iot-portal.com/help

Declaration of Conformity

Document Number: DOC_MQX_103_DoC

Issuer's Name: Priory Access Ltd

Issuer's Address: 23 Goodlass Road, Liverpool, L24 9HJ

Object of the declaration: MQX1.03

The object of the declaration described above is in the conformity with the relevant Union harmonisation legislation:

2014/108/EC The Electromagnetic Compatibility

Directive 2011/65/EU The Restriction of Hazardous Substances
Directive 2014/53/EU RED Art3.1(b) Radio Equipment Directive Conformity is shown by compliance with the applicable requirements of the following documents:

Safety: EN 60950-1:2006+A2:2013

EMC: EN 301 489-1 V1.9.2 (2011-09) EN 301 489-7 V1.3.1 (2005-11) EN 301 489-17 V2.2.1 (2012-09) EN 301 489-24 V1.5.1 (2010-10)

Radio: EN 301 511 V12.0.0 (2015-02) EN 300 328 V1.9.1 (2015-02) EN 301908-1 V7.0.1 (2014-11) EN 301908-2 V6.2.1 (2013-10)

Technical Construction File required by this directive is maintained at 23 Goodlass Road, L24 9HJ UK

Signed for and on behalf of Access Controls Ltd

Name: Michael Beaver
Position: Director
Date: 02/06/2021

Made in UK