



INSYS Smart Device Monitoring App

Transmitting Switch Signals Via SMS

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URL http://www.insys-icom.com

Print 24. Jan. 2024

Item No. -Version 1.2 Language EN

1 Introduction

General

The present publication refers to a combination of selected hardware and software components of INSYS icom GmbH as well as other manufacturers. All components have been combined with the target to realize certain results and effects for certain applications in the field of professional data transfer.

The exact descriptions of all used components, to which this publication refers, are described in the tables *Hardware*, *Accessories* and *Software* at the end of this publication.

The symbols and formattings used in this publication are explained in the correspondent section of the device manual.

Some configurations or preparations, which are precondition in this publication, are described in other publications. Therefore, always refer to the related device manuals. INSYS Smart Devices with web interface provide you with helpful information about the configuration possibilities, if you click on "display help text" in the header.

Target of this Publication

An exemplary configuration for a typical fault monitor application is presented here. If your application has similar requirements, you may modify the configuration on the basis of this Configuration Guide.

The level of an upper basin is regulated in an application by switching on a pump at the remote lower basin in case of a low level that will run until the maximum level is achieved. An INSYS IMON fault monitor is installed at the upper basin for this to which two level sensors are connected - one for low and one for maximum level. Another IMON is at the lower basin that actuates the pump via its output. Both IMONs communicate with each other via SMS.

In case of a low level, the level sensor will activate an input at the IMON. There-upon, this will send an SMS with the command for switching on the pump to the other IMON. A timer will start simultaneously that will send the SMS again upon its expiry. If the IMON will receive an SMS with the acknowledgement of receipt from the other IMON before the timer expires, the timer will be reset an no SMS will be dispatched any more. Correspondingly, the level sensor for maximum level will activate the other input at the IMON which will cause the dispatch of an SMS with the command for switching off the pump to the other IMON. The SMS will also be sent again here upon expiry of the timer, if now acknowledgement is received.

The IMON at the lower basin will switch on the pump and send the SMS with the acknowledgement of receipt to the other IMON upon receipt of the SMS with the switch on command. A timer will start simultaneously that will switch off the pump

upon expiry of the maximum pump time to avoid overfilling. If the IMON will receive an SMS with the switch off command, it will switch off the pump again and send the SMS with the acknowledgement of receipt to the other IMON.

The following describes how to configure the monitoring application of two INSYS IMON fault monitors such that they fulfil above described task. It is prerequisite here that the fault monitors are ready for operation, i.e. a SIM card is inserted and they are configured accordingly.

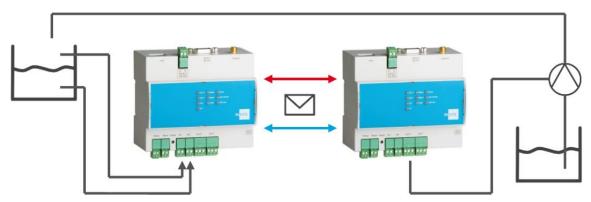


Figure 1: Transmitting switch signals via SMS - overview

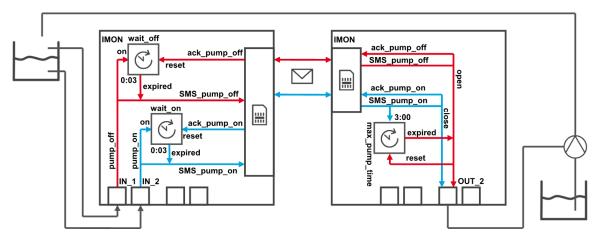


Figure 2: Transmitting switch signals via SMS - simplified diagram

2 Summary

Fault monitor configuration

How to configure two INSYS fault monitors for transmitting switch signals via SMS to operate a pump level-dependent. You will find detailed step by step instructions in the following section.

■ IMON at upper basin

- Add device "IMON" with the type "I/O"
- Add element "IN_1" as input 1 of the IMON
- Add element "IN_2" as input 2 of the IMON
- Add element "wait_off" as stop watch timer with 3 minutes
- Add element "wait_on" as stop watch timer with 3 minutes
- Add contact "Pump" with mobile phone number
- Add monitoring "pump_off" (input IN_1 closes)
- Add monitoring "pump_on" (input IN_2 closes)
- Add monitoring "wait_off_exp" (wait_off expired)
- Add monitoring "wait_on_exp" (wait_on expired)
- Add monitoring "ack_pump_off" as message from "Pump"
- Add monitoring "ack_pump_on" as message from "Pump"
- Add action "SMS_pump_off" as message to "Pump"
- Add action "SMS_pump_on" as message to "Pump"
- Add action "wait_off_start" (start wait_off)
- Add action "wait_on_start" (start wait_on)
- Add action "wait_off_reset" (reset wait_off)
- Add action "wait_on_reset" (reset wait_on)
- Add assignment "pump_off" to "SMS_pump_off"
- Add assignment "pump_off" to "wait_off_start"
- Add assignment "pump_on" to "SMS_pump_on"
- Add assignment "pump_on" to "wait_on_start"
- Add assignment "ack_pump_off" to "wait_off_reset"
- Add assignment "ack_pump_on" to "wait_on_reset"
- Add assignment "wait_off_exp" to "SMS_pump_off"
- Add assignment "wait_off_exp" to "wait_off_start"

- Add assignment "wait_on_exp" to "SMS_pump_on"
- Add assignment "wait_on_exp" to "wait_on_start"

■ IMON at lower basin

- Add device "IMON" with the type "I/O"
- Add element "OUT_2" as output 2 of the IMON
- Add element "max_pump_time" as stop watch timer with 3 hours
- Add contact "Sensor" with mobile phone number
- Add monitoring "SMS_pump_off" as message from "Sensor"
- Add monitoring "SMS_pump_on" as message from "Sensor"
- Add monitoring "max_pump_time_exp" (max_pump_time expired)
- Add action "ack_pump_off" as message to "Sensor"
- Add action "ack_pump_on" as message to "Sensor"
- Add action "max_pump_time_start" (start max_pump_time)
- Add action "max_pump_time_reset" (reset max_pump_time)
- Add action "OUT_2_open" as opening of output 2 of the IMON
- Add action "OUT 2 close" as closing of output 2 of the IMON
- Add assignment "SMS_pump_off" to "OUT_2_open"
- Add assignment "SMS_pump_off" to "ack_pump_off"
- Add assignment "SMS_pump_off" to "max_pump_time_reset"
- Add assignment "SMS_pump_on" to "OUT_2_close"
- Add assignment "SMS_pump_on" to "ack_pump_on"
- Add assignment "SMS_pump_on" to "max_pump_time_start"
- Add assignment "max_pump_time_exp" to "OUT_2_open"

3 Configuration

Provisions

It is recommended to commission the router as suggested in the Quick Installation Guide. Different settings of the router may result in necessary adjustments of the settings described in the following. Please prepare the following items before starting the configuration of the application:

Connection to the router

→ You have access to the Monitoring App of the router via your web browser.

Configurations in the router

- → The router is logged in to the cellular network (configuration via startup wizard or in "GSM / GPRS" or "UMTS" menu).
- → The router can receive SMS (the Service Center Number is specified and SMS reception is activated in the "Messages" menu on the "Configuration" page).

Configuration of the Monitoring App (IMON at upper basin)

A functional Monitoring App requires to add the individual devices, elements, logic operations, recipients, monitorings and actions as well as the assignment of actions to monitorings.

This configuration serves for the IMON at the upper basin to which the level sensors are connected.

Perform the following steps for this:

- Adding devices
- Adding elements
- Adding recipients
- Adding monitorings
- Adding actions
- Adding assignments

Adding devices

How to add the necessary devices for the Monitoring App. It is necessary to add the inputs and outputs of the fault monitor as a device for this application.

- 1. Select in the menu the page → Setup application → Devices
- 2. Select the Add device button
 - √ The "Add device" page appears.
- 3. Enter "IMON" as name and select the type "I/O"

Gerät hinzufügen



- 4. Click on OK
 - You have added the devices that are necessary for the application with this.

Adding elements

How to add the necessary elements for the Monitoring App. It is necessary to add input 1 and 2 as well as two timers as elements for this application.

- 1. Select in the menu the page → Setup application → Elements
- 2. Select the Add Element button
 - √ The "Add element" page appears.
- 3. Enter "IN_1" as name and select "IO", "IMON" and "Input" under Device
- 4. Enter "1" as number for input 1 of the fault monitor

Element hinzufügen



- 5. Click on OK
- 6. Select the Add element button again and add the elements "IN_2" (input 2), "wait_off" (stop watch timer with 3 minutes) and "wait_on" (stop watch timer with 3 minutes) one after another
 - ✓ The elements appear in the respective list one after another.

Elemente



✓ You have added the elements that are necessary for the application with this.

Adding recipients

How to add the necessary recipients for the Monitoring App. It is necessary to add the mobile phone number of the IMON at the lower basin for the receipt of the SMS and the transmission of the acknowledgements for this application.

- 1. Select in the menu the page → Setup application → Recipients
- 2. Select the Add recipient button
 - √ The "Add recipient" page appears.
- 3. Enter "Pump" as name
- 4. Select the recipient type "Mobile phone"
- 5. Enter the mobile phone number

Empfänger hinzufügen



- 6. Click on OK
 - ✓ You have added the recipients that are necessary for the application with this.

Adding monitoring operations

How to add the monitoring operations for the Monitoring App. It is necessary to monitor the inputs 1 and 2, the expiration of both timers and the receipt of the acknowledgement SMS for this application.

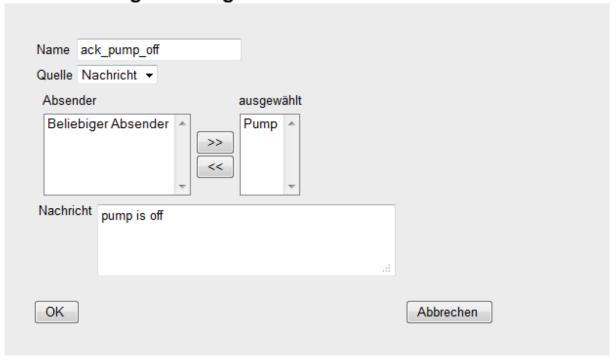
- 1. Select in the menu the page → Monitoring
- 2. Select the Add monitoring button
 - √ The "Add monitoring" page appears.
- 3. Enter "pump_off" as name and select "Element", "IN_1" and "closes" under Source

Überwachung hinzufügen



- 4. Click on OK
- 5. Select the Add monitoring button again and add the monitorings "pump_on" (input 2 closes), "wait_off_exp" (wait_off expired) and "wait_on_exp" (wait_on expired) one after another
- 6. Select the Add monitoring button
- 7. Enter "ack_pump_off" as name and select "Message" under Source
- 8. Highlight "Pump" under Sender and select the >> button
- Enter the text that must be contained by the acknowledgement SMS under Message

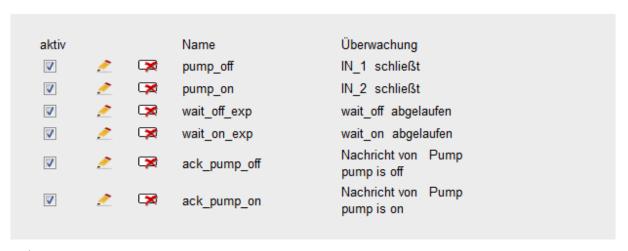
Überwachung hinzufügen



- 10. Click on OK
- 11. Select the Add monitoring button again and add the monitoring "ack_pump_on" (acknowledgement SMS from "Pump")
 - √ The monitorings appear in the respective list one after another.

Überwachungen

Überwachung hinzufügen



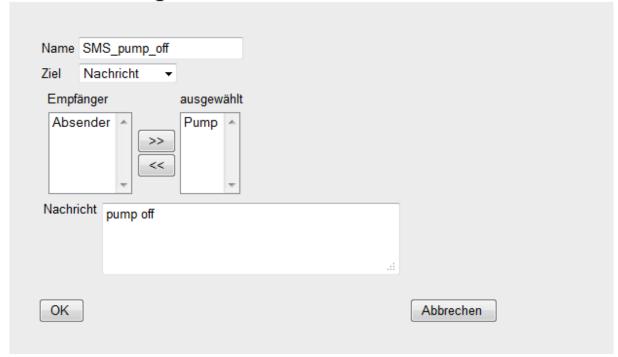
You have added the monitoring operations that are necessary for the application with this.

Adding actions

How to add the actions for the Monitoring App. It is necessary to send the SMS with the commands for switching the pump on and off as well as start and reset the two timers for this application.

- 1. Select in the menu the page → Actions → Definitions
- 2. Select the Add action button
 - √ The "Add action" page appears.
- 3. Enter "SMS_pump_off" as name and select "Message" under Target
- 4. Highlight "Pump" under Recipient and select the | >> | button
- 5. Enter the SMS text under Message

Aktion hinzufügen



- 6. Click on OK
- 7. Select the Add action button and add the actions "SMS_pump_on" (SMS for activating the pump), "wait_off_start" (start timer wait_off), "wait_on_start" (start timer wait_on), "wait_off_reset" (reset timer wait_off) and "wait_on_reset" (reset timer wait_on) one after another
 - ✓ The actions appear in the respective list one after another.

Definition Aktionen

Aktion hinzufügen

aktiv			Name	Aktion
V	<u> </u>	×	SMS_pump_off	Nachricht an Pump pump off
V	<u> </u>	×	SMS_pump_on	Nachricht an Pump pump on
V	<i>**</i>	×	wait_off_start	wait_off starten
V	<i>→</i>	×	wait_on_start	wait_on starten
V	<i>→</i>	×	wait_off_reset	wait_off zurücksetzen
V	<i>→</i>	×	wait_on_reset	wait_on zurücksetzen

You have added the actions that are necessary for the application with this.

■ Adding assignments

How to add the assignments for the Monitoring App. It is necessary to assign the respective actions to the monitorings for this application.

- 1. Select in the menu the page → Actions → Assignments
- 2. Select the Add assignment button
 - √ The "Add assignment" page appears.
- 3. Select "pump_off" as Monitoring and "SMS_pump_off" as Action

Zuordnung hinzufügen



- 4. Click on OK
- 5. Select the Add assignment button again and add the assignments "pump_off" to "wait_off_start", "pump_on" to "SMS_pump_on", "pump_on" to "wait_on_start", "ack_pump_off" to "wait_off_reset", "ack_pump_on" to "wait_on_reset", "wait_off_exp" to "SMS_pump_off", "wait_off_exp" to "wait_off_start", "wait_on_exp" to "SMS_pump_on" and "wait_on_exp" to "wait_on_start" one after another
 - ✓ The assignments appear in the respective list one after another.

Zuordnungen

Zuordnung hinzufügen

aktiv			Überwachung	Aktion
✓	<i>₽</i>	×	pump_off	SMS_pump_off
V	<i>₽</i>	×	pump_off	wait_off_start
V	<i>₩</i>	C X	pump_on	SMS_pump_on
V	<i>₩</i>	C X	pump_on	wait_on_start
V	<i>₽</i>	C X	ack_pump_off	wait_off_reset
V	<i>₽</i>	C X	ack_pump_on	wait_on_reset
▼	<i>₽</i>	×	wait_off_exp	SMS_pump_off
V	<i>₽</i>	×	wait_off_exp	wait_off_start
V	<i>₩</i>	×	wait_on_exp	SMS_pump_on
V	<i>♠</i>	(X	wait_on_exp	wait_on_start

You have added the assignments that are necessary for the application with this.

Configuration of the Monitoring App (IMON at lower basin)

A functional Monitoring App requires to add the individual devices, elements, logic operations, recipients, monitorings and actions as well as the assignment of actions to monitorings.

This configuration serves for the IMON at the lower basin to which the pump is connected.

Perform the following steps for this:

- Adding devices
- Adding elements
- Adding recipients
- Adding monitorings
- Adding actions
- Adding assignments

Adding devices

How to add the necessary devices for the Monitoring App. It is necessary to add the inputs and outputs of the fault monitor as a device for this application.

- 1. Select in the menu the page → Setup application → Devices
- 2. Select the Add device button
 - √ The "Add device" page appears.
- 3. Enter "IMON" as name and select the type "I/O"

Gerät hinzufügen



- 4. Click on OK
 - You have added the devices that are necessary for the application with this.

Adding elements

How to add the necessary elements for the Monitoring App. It is necessary to add output 2 as well as a timer as elements for this application.

- 1. Select in the menu the page → Setup application → Elements
- 2. Select the Add Element button
 - √ The "Add element" page appears.
- 3. Enter "OUT_2" as name and select "IO", "IMON" and "Output" under Device
- 4. Enter "2" as number for output 2 of the fault monitor

Element hinzufügen



- 5. Click on OK
- 6. Select the Add element button again and add the element "max_pump_time" (stop watch timer with 3 hours)
 - ✓ The elements appear in the respective list one after another.

Elemente



✓ You have added the elements that are necessary for the application with this.

Adding recipients

How to add the necessary recipients for the Monitoring App. It is necessary to add the mobile phone number of the IMON at the upper basin for the receipt of the SMS and the transmission of the acknowledgements for this application.

- 1. Select in the menu the page → Setup application → Recipients
- 2. Select the Add recipient button
 - √ The "Add recipient" page appears.
- 3. Enter "Sensor" as name
- 4. Select the recipient type "Mobile phone"
- 5. Enter the mobile phone number

Empfänger hinzufügen



- 6. Click on OK
 - You have added the recipients that are necessary for the application with this.

Adding monitoring operations

How to add the monitoring operations for the Monitoring App. It is necessary to monitor the receipt of the command SMS as well as the expiry of the timer for this application.

- 1. Select in the menu the page → Monitoring
- 2. Select the Add monitoring button
 - ✓ The "Add monitoring" page appears.
- 3. Enter "SMS_pump_off" as name and select "Message" under Source
- 4. Highlight "Sensor" under Sender and select the |>> | button
- Enter the text that must be contained by the acknowledgement SMS under Message

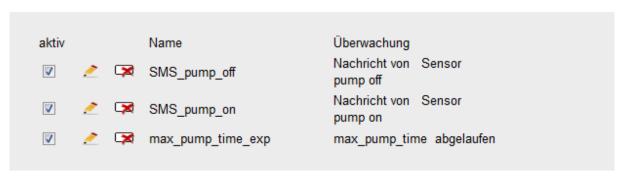
Überwachung hinzufügen



- 6. Click on OK
- 7. Select the Add monitoring button again and add the monitorings "SMS_pump_on" (command SMS from "Sensor") and "max_pump_time_exp" (max_pump_time expired) one after another
 - √ The monitorings appear in the respective list one after another.

Überwachungen

Überwachung hinzufügen



You have added the monitoring operations that are necessary for the application with this.

Adding actions

How to add the actions for the Monitoring App. It is necessary to send the acknowledgement SMS, start and reset the timer as well as open and close output 2 for this application.

- 1. Select in the menu the page → Actions → Definitions
- 2. Select the Add action button
 - √ The "Add action" page appears.
- 3. Enter "ack_pump_off" as name and select "Message" under Target
- 4. Highlight "Sensor" under Recipient and select the |>> | button
- 5. Enter the SMS text under Message

Aktion hinzufügen



- 6. Click on OK
- 7. Select the Add action button and add the actions "ack_pump_on" (SMS for confirming pump operation), "max_pump_time_start" (start timer max_pump_time), "max_pump_time_reset" (reset timer max_pump_time), "Out_2_open" (open output 2) and "OUT_2_close" (close output 2) one after another
 - ✓ The actions appear in the respective list one after another.

Definition Aktionen

Aktion hinzufügen

aktiv			Name	Aktion
V	<u></u> <i> </i>	×	ack_pump_off	Nachricht an Sensor pump is off
V	<u></u> <i> </i>	×	ack_pump_on	Nachricht an Sensor pump is on
V	<i>**</i>	×	max_pump_time_start	max_pump_time starten
V	1	×	max_pump_time_reset	max_pump_time zurücksetzen
V	<i>M</i>	×	OUT_2_open	OUT_2 öffnen
V	1	×	OUT_2_close	OUT_2 schließen

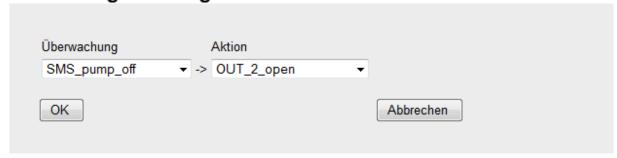
You have added the actions that are necessary for the application with this.

Adding assignments

How to add the assignments for the Monitoring App. It is necessary to assign the respective actions to the monitorings for this application.

- 1. Select in the menu the page → Actions → Assignments
- 2. Select the Add assignment button
 - √ The "Add assignment" page appears.
- 3. Select "SMS_pump_off" as Monitoring and "OUT_2_open" as Action

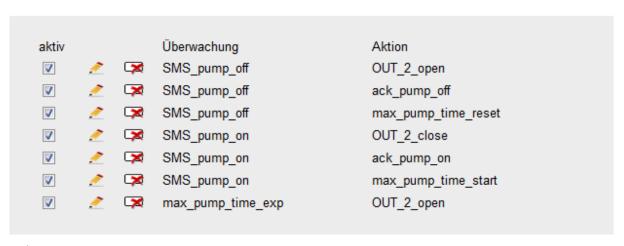
Zuordnung hinzufügen



- 4. Click on OK
- 5. Select the Add assignment button again and add the assignments "SMS_pump_off" to "ack_pump_off", "SMS_pump_off" to "max_pump_time_reset", "SMS_pump_on" to "OUT_2_close", "SMS_pump_on" to "ack_pump_on", "SMS_pump_on" to "max_pump_time_start" and "max_pump_time_exp" to "OUT_2_open" one after another
 - ✓ The assignments appear in the respective list one after another.

Zuordnungen

Zuordnung hinzufügen



You have added the assignments that are necessary for the application with this.

4 Test

Testing the application

The Monitoring App is active directly after configuration. You can check the correct function directly by closing input 2 of the IMON at the upper basin manually. This should dispatch an SMS to the IMON at the lower basin the, whereupon this closes output 2 to operate the pump.

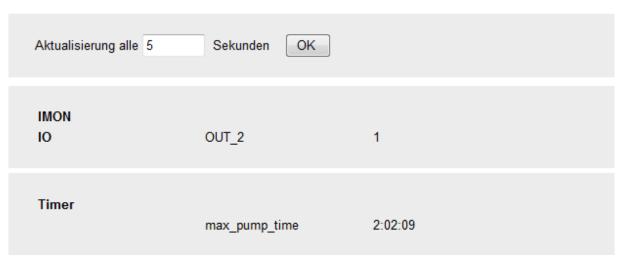
The status of input 2 is directly indicated on the status page of the web interface of the Monitoring App of the IMON at the upper basin as closed and the timer wait_on starts to run (consider update interval).

Status



The status of output 2 is directly indicated on the status page of the web interface of the Monitoring App of the IMON at the lower basin as closed and the timer max_pump_time starts to run (consider update interval).

Status



A SIM card must be inserted and the fault monitor must be configured accordingly (PIN, SCN, SMS reception) for receiving and dispatching the SMS for both IMONs.

5 Used Components

Please observe: The power supply units required to operate devices are not listed here in detail. Take care for a provision at the site, if they are not part of the scope of delivery.

Hardware

Description	Manufacturer	Type	Version
Fault monitor	INSYS	IMON-G100 IMON-G200 IMON-U300	Firmware 2.12.5 Monitoring 2.2.0

Table 1: Used hardware

Software

Description	Manufacturer	Туре	Version
Operating system	Microsoft	Windows 7	Ultimate SP1
Browser	Mozilla	Firefox	39

Table 2: Used software

Germany

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