UniPOS-BMS

Instruction manual

Contents

Rev. 05/02.17

1. Overview

1.1. About

The *UniPOS-Modbus Converter* is an RS-232«»RS-485 interface module used to interface various third party Modbus Compatible equipment (PLC - Programmable Logic Controllers equipment) to the UniPOS Interactive Fire Alarm System IFS7000. The module is both a physical and a logic protocol converter:

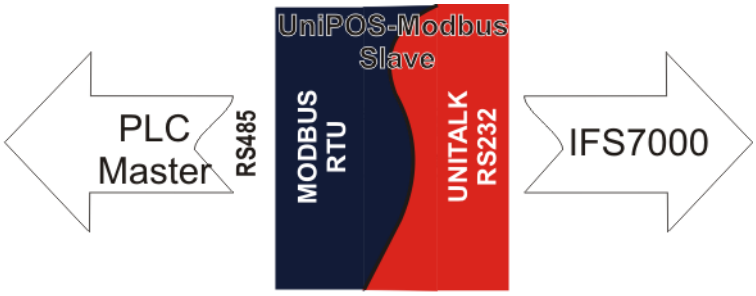
- At the physical connection level, it transforms a RS232 connection to a RS485 connection. The interface is galvanically isolated giving improved reliability in noisy environments;
- At a Logical protocol level, it transforms the UniTalk protocol to the Modbus protocol;

The UniPOS-Modbus module is connected to the UniPOS IFS7000 system via the UniTalk protocol.

The UniPOS-Modbus Slave will passively respond to a Modbus Master's request (typically a PLC).

The Modbus protocol and the Unitalk protocol are independent protocols from timing point of view:

- the UniPOS Modbus Slave regularly (on a period of 1 sec.) communicates with the IFS7000 system and collects its status which is updated in the Modbus Map;
- meanwhile the Modbus Master PLC pools the Modbus map (on a period required from the integration) on its bases through the Modbus protocol;



The UniPOS-Modbus Converter offers:

- Detector statuses of the UniPOS IFS7000 addressable system to be available to a Modbus PLC;
- FPE (Fire Protection Equipment) status and control in Alarm mode of the IFS7000 system;
- Basic commands form the Modbus PLC, through the UniPOS-Modbus converter To the UniPOS IFS7000 system;
- FAD (Fire Alarm Device) status and control in Alarm mode;

1.2. Interfaces

- UniPOS RS232 interface:
  - communication speed : 2400 b/s (default), 4800 b/s (maximum), optional;
  - RS232 configuration : info bits : 8, parity : none, stop bits : 2;
- Modbus RTU RS485 interface:
  - communication speed : 19200 b/s (default), optional;
  - RS485 configuration : info bits : 8, parity : even, stop bits : 1, optional;

1.3. Technical specification

- Power Supply :
  External power supply (12 - 30)Vdc;
  Galvanic separated;

- UniPOS RS232 connector:
  connector pins : Rx, Tx, GND;

- Modbus RS485 connector:
  Input connection pins : A, B, GND - Terminated;
  Output connection pins : A, B;
  Galvanic separated;

2. Connection diagram

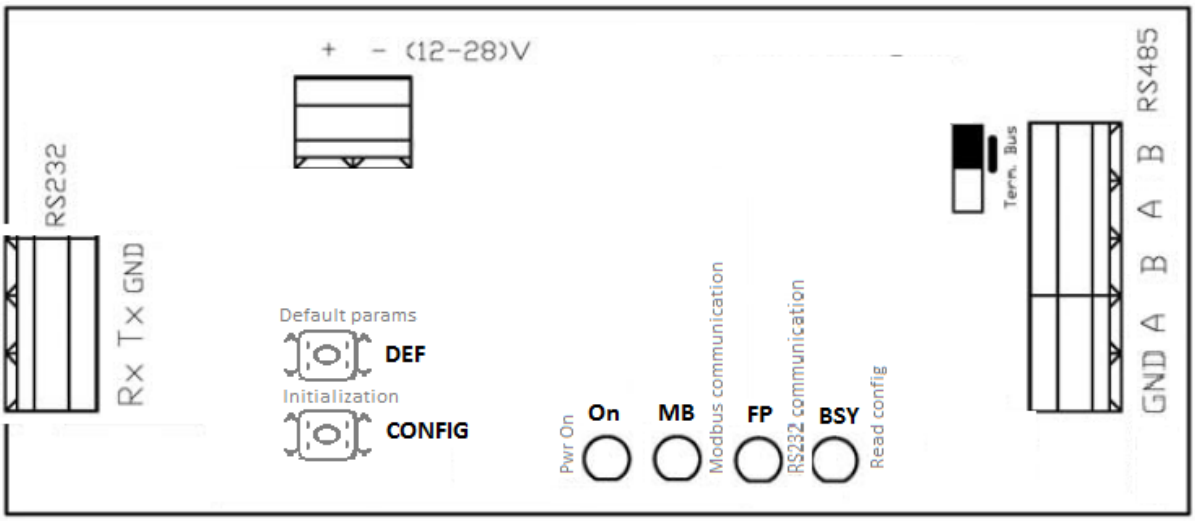


fig.1.1

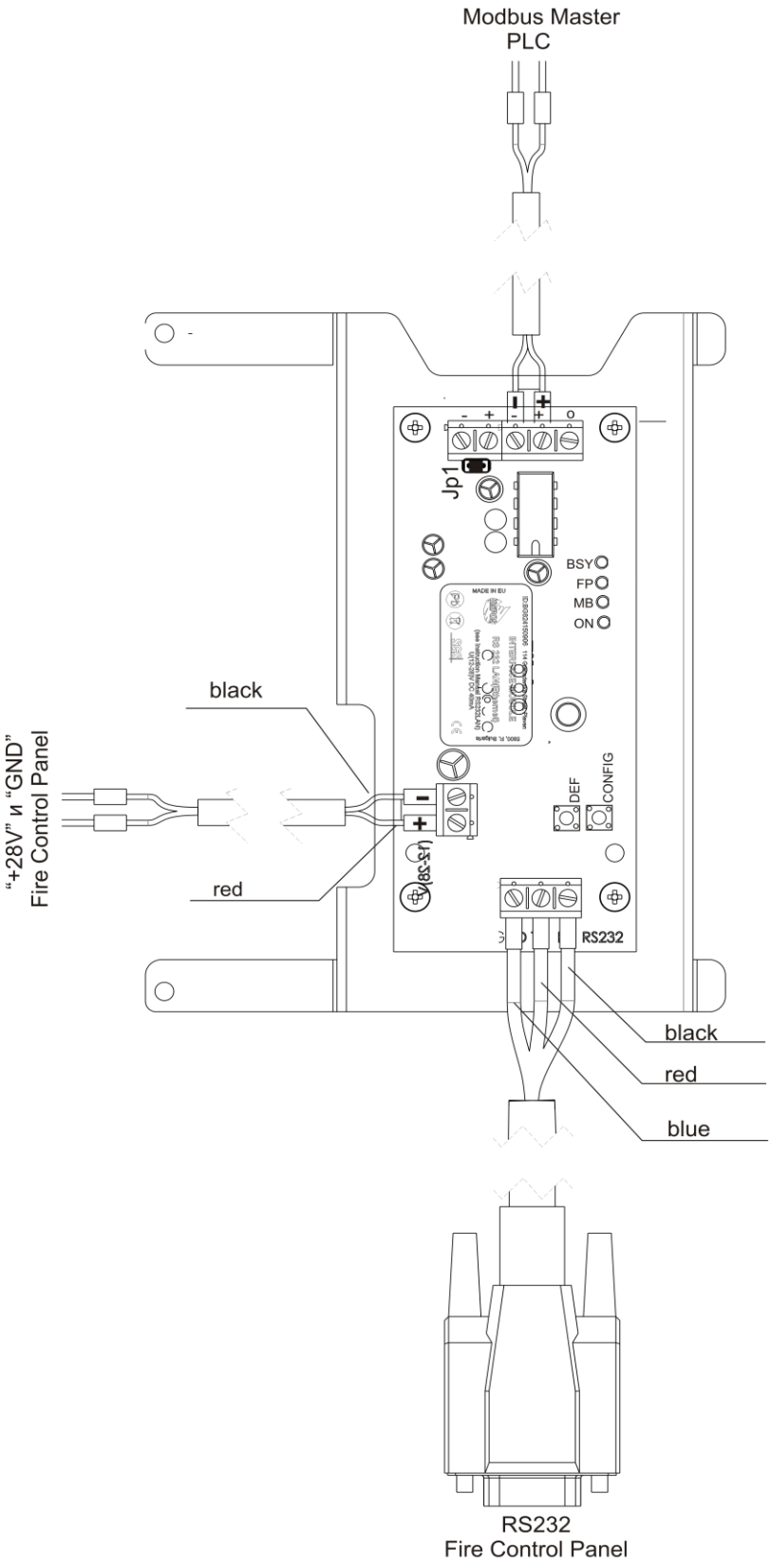

Modbus Master
PLC
Jp1
BSY
FP
MB
ON
DEF
CONFIG
RS232
black
red
"+28V" и "GND"
Fire Control Panel
black
red
blue
RS232
Fire Control Panel

fig.1.2

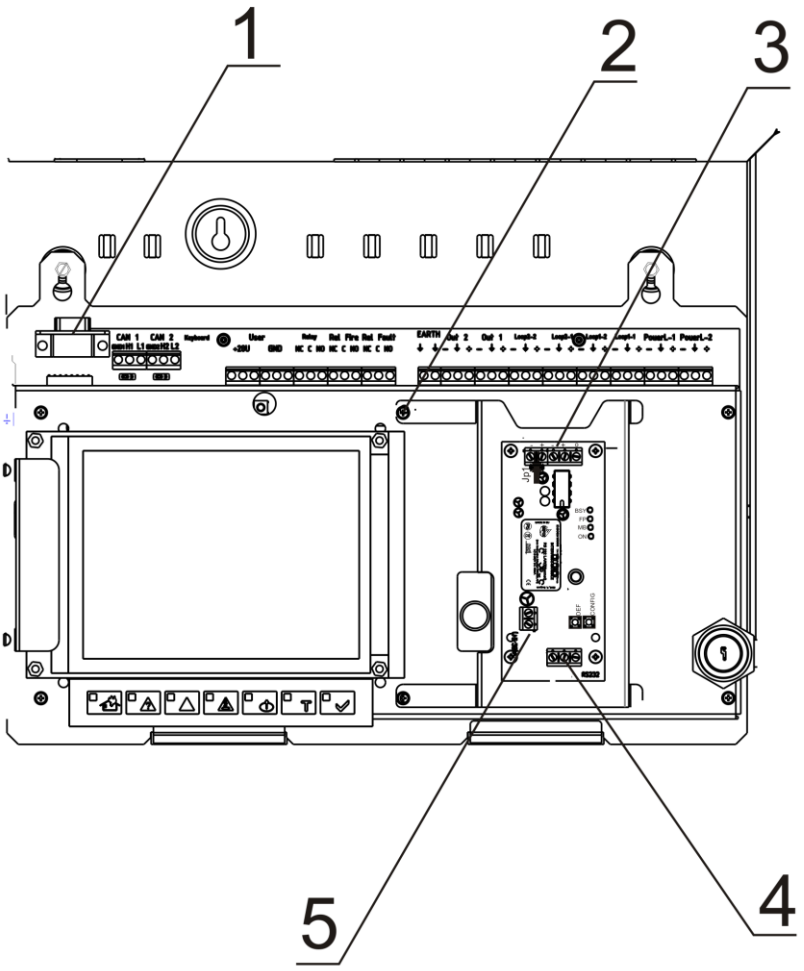


fig.1.3

Module Installation steps:

Mount the device on the front side of the panel, next to the display (fig.1.3);
Unscrew the screw of the front metal cover – fig.1.3, pos.2;
Place the module and tighten the screws;
Install the RS cable as described on fig.1.2 – black > RX, red > Tx, blue > GND;
Install the power cable as described on fig.1.2. and then power supply the module from the 28Vdc user voltage of the 7002 panel;
Connect the Master Modbus unit to the RS485 connector (fig.1.3, pos.3) of the UniPOS BMS module;

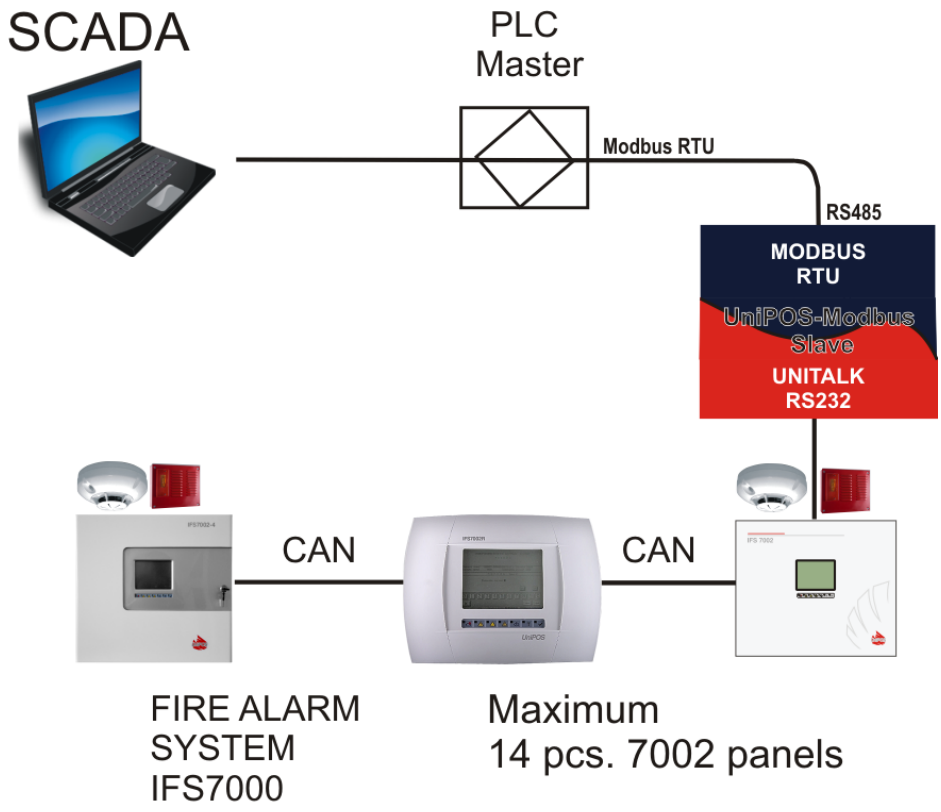


fig.2

One piece of UniPOS BMS module (fig.2) can be interfaced with an IFS7000 system of Maximum 14 panels IFS7002 network connected through their built-in Network CAN interface (fig.2).

3. Modbus mapping

3.1. Data

Modbus Register	Info		bits / bytes
Holding register **1**	Command Write ONLY Code0x06, Start Address 1		Reset Fire, Sounders supress, Disable, Enable, Stop beeper, Go to fire phase2, Delay outputs activation
Holding register **2**	MS == sec + minutes,	Write & Read, Code0x10, Strt Addr. 02, Nmb. 04	date and time
Holding register **3**	Hour + DOW,		
Holding register **4**	Day + Month,		
Holding register **5**	LS time == Year + Not Appl		
Input registers **[1 - 125]** for panel Local	Loop unit 3 500 pcs. (14 panels)		bit = ON/OFF
Input registers **[126 - 250]** for Remote panel#1			bit = Alarm / Active input
Input registers **[251 - 375]** for Rem.panel#2			bit = Active output/ not active out
Input registers **[376 - 500]** for Rem.panel#3			bit = Link lost
Input registers **[501 - 625**] for Rem.panel#4			bit = Disable/Enable
Input registers **[626 - 750]** for Rem.panel#5			bit = Fault
……			bit = type
Input registers **[1625 - 1750]** for Rem.panel#13			bit = type
Input registers **[1751 - 1775]** for panel Local,zone#1 to zone#50	700 zones		bit = ON/OFF
Input registers **[1776 - 1800]** for Remote panel#1,zone#1 to zone#50			bit = Fire1
Input registers **[1801 - 1825]** for Rem.panel#2,zone#1 to zone#50			bit = Fire2
Input registers **[1826 - 1850]** for Rem.panel#3,zone#1 to zone#50			bit = Link lost
Input registers **[1851 - 1875]** for Rem.panel#4,zone#1 to zone#50			bit = Disable/Enable
Input registers **[1876 - 1900]** for Rem.panel#5,zone#1 to zone#50			Fault
……			Test
Input registers **[2075 - 2100]** for Rem.panel#13,zone#1 to zone#50			not used
Input registers **[2101 - 2107]** for the 14 panels	14 panels		ON/OFF
Input register **2101** for Local panel & Remote panel#1			Loop1 init flag
Input register **2102** for Rem.panel#2 & Rem.panel#3			Loop2 init flag
Input register **2103** for Rem.panel#4 & Rem.panel#5			Link lost
Input register **2104** for Rem.panel#6 & Rem.panel#7			Setup mode

Input register **2105** for Rem.panel#8 & Rem.panel#9		Fault
…		System operations
Input register **2107** for Rem.panel#12 & Rem.panel#13		Fire
Input registers **[2108 - 2135**] for the 14 FPE#1 modules	FPE # 1 = 14 modules	byte1 & (bit1, byte2) & (bit2, byte2) = 10 pcs. Inputs Status
Sequence of modules is FPE#1 Modules from Local panel, then FPE#1 modules from Rem.panel#1, then FPE#1 modules from Rem.panel#2 ….. then FPE#1 modules from Rem.panel#13		byte3 & byte4 = 16 pcs. Outputs Status
Input registers **[2136 - 2275]** for the 140 FPE#2 modules	FPE # 2 = 140 modules	bit1 & bit2 & bit3 = Inputs Status
Sequence of modules is FPE#2 Modules from Local panel, then FPE#2 modules from Rem.panel#1, then FPE#2 modules from Rem.panel#2 …... then FPE#2 modules from Rem.panel#13		bit4 & bit5 & bit6 & bit7 & bit8 = Outputs Status
Input register **[5000]**	Event code counter	LSB – maximum number of the list of events; MSB – current number of error codes;
Input register **[5001, 5002]**	Event code details	Details for each fault 4 bytes

Refer Annex 2 for further details.

3.1.1. bit-set in the "Loop unit" Input register (FD, FPE, FAD)

bit7	6	5	4	3	2	1	bit0
On/Off	Input Alarm	Output Alarm	Link lost	Enable/Disable	Fault	Type bit	Type bit

Single byte is used for 3 type of Modbus units and therefore each bit will be in the context of the relevant type of Modbus unit:

- FD – Fire detector: optical-smoke (7130), temperature (7110/7120), combined (7160), Manual Call Point (7150), Conventional interface unit (7201 / 7201S);

  bit#7 – the address from the loop is located (bit#7=1);
  bit#6 - FD device is in Fire (bit#6=1);
  bit#5 – not applicable for this FD type of device;
  bit#4 – no communication with this address of the loop (bit#4=1);
  bit#3 – the FD device is Enabled(bit#3=0) / Disabled (bit#3=1);
  bit#2 – the FD device is in Fault (bit#2=1);
  bit#1 – == '0' for FD type of the Modbus component;
  bit#0 – == '0' for FD type of the Modbus component;

- FPE – input/output modules 3ins/5outs(7203), 10ins/16outs(7203O);

bit#7 - the address from the loop is located (bit#7=1);
bit#6 - FPE device is with activated Input (bit#6=1);
Additional info for the number of the activated input is located in the FPE#1 and FPE#2 bytes of the Modbus mapping.
bit#5 - FPE is with activated output (bit#5=1);
Additional info for the number of the activated output is located in the FPE#1 and FPE#2 bytes of the Modbus mapping.
bit#4 – no communication with this address of the loop (bit#4=1);

bit#3 – the FPE device is Enabled (bit#3=0) / Disabled (bit#3=1);
bit#2 – the FPE device is in Fault (bit#2=1);
==========
bit#1 – == '1' for FPE#1 type of the Modbus component;
bit#0 – == '0' for FPE#1 type of the Modbus component;
or
bit#1 – == '1' for FPE#2 type of the Modbus component;
bit#0 – == '1' for FPE#2 type of the Modbus component;

- FAD – sounder (7204), module 1in/1out (7203IO), module 1 out (7203R, 7203OC);

bit#7 - the address from the loop is located (bit#7=1);
bit#6 – the FAD device is with activated input (bit#6=1) – relevant only to module 7203IO;
bit#5 - FAD device is with activated output (bit#5=1) – relevant to each of the FAD device listed above;
bit#4 – no communication with this address of the loop (bit#4=1);
bit#3 – the FAD device is Enabled (bit#3=0) / Disabled (bit#3=1);
bit#2 – the FAD device is in Fault (bit#2=1);
bit#1 – == '0' for FAD type of the Modbus component;
bit#0 – == '1' for FAD type of the Modbus component;

3.1.2. bit-set in the "Zone-unit" Input register (FZ)

bit7	6	5	4	3	2	1	bit0
On/Off	Fire1	Fire2	Link lost	Enable/Disable	Fault	Test	not used

bit#7 – the zone is located (bit#7=1);
bit#6 - FZ is in status Fire phase 1 (bit#6=1);
bit#5 - FZ is in status Fire phase 2 (bit#5=1);

bit#4 – no communication with the relevant panel belonging the zone (bit#4=1);

bit#3 – FZ is Enabled (bit#3=0) / Disabled (bit#3=1);
bit#2 – FZ is in fault (bit#2=1);
bit#1 – FZ is in Test (bit#1=1);
bit#0 – not in use;

3.1.3. bit-set in the "Panel-unit" Input register (FAP)

bit7	6	5	4	3	2	1	bit0
On/Off	Loop1 init	Loop2 Init	Link lost	Setup mode	Fault	Syst operations mode	Fire

bit#7 – a 7002 panel is located (bit#7=1);
bit#6 - Loop 1 is in fault (bit#6=1);

Faults : short-circuit loop, open loop, Uninitialized loop;
bit#5 - Loop 2 is in fault (bit#5=1);
Faults : short-circuit loop, open loop, Uninitialized loop;
bit#4 – no communication with the relevant panel (bit#4=1);
bit#3 – the panel is in Set-up mode. Therefore faults and fires can not be detected (bit#3=1);
bit#2 – the panel is in fault state (bit#2=1);
bit#1 – the panel is Resetted (bit#1=1) – exit from setup-mode;
bit#0 – the panel is in fire state (bit#0=1);

3.1.4. bit-set in the additional info byte dedicated to the "7203O-unit" (FPE#1)

If the relevant bit is set ('1'), then the input/output is in active state.

3.1.5. bit-set in the additional info byte dedicated to the "7203-unit" (FPE#2)

If the relevant bit is set ('1'), then the input/output is in active state.

3.1.6. Event code register

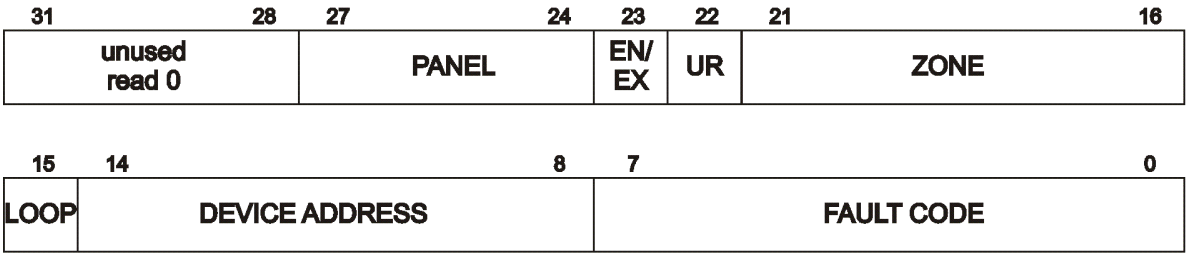
Input register 5000 – Info byte for the maximum capacity of the buffer and the current number of not-processed event-codes:

Read 1Input register only;
LSB is the maximum size of the event-code buffer;
MSB is the number of not processed event-codes;

The event-codes are processed through the Input Registers 5001 and 5002.

Input Registers 5001 and 5002:

Read 2 Input register only;



Input register 5001, 5002:

Bits 0-7 (first byte) - fault code (refer evet-table in Annex 1);
Bits 8-15 (second byte) - device address (1-125), if bit 15 is set - device is in loop 2 (MSBit is loop bit)
Bits 16-21 (third byte) - zone
Bit 22 (third byte) - fault not yet read - should always be 1, if 0 - program error
Bit 23 (third byte) - enter (1) or exit (0) fault
Bits 24-27 (fourth byte) - panel number
Bits 28-31 (fourth byte) - unused

3.2. Modbus communication

The Modbus Master reads the Input registers and based on the bit-set description the status of each Modbus unit is de-coded (described in 3.1 Table).

The Modbus Master sends commands to the IFS7000 system through Write operation to the Holding register #1. The Holding register#1 is not Read-able.
The Modbus Master sets/reads date/time to the IFS7000 system through Write/Read operation to the Holding register #2 to Holding register#5.

The Modbus commands for IFS7000 control sent through the Holding register#1 are as follow:
0xF000 - panel number (0-15, used 0-13) :

- panel 0 = local panel;
- panel 1 – panel 13 are the 13 pcs. remote panels networked to the local panel;

0x0800 - flag: enable(0)/disable(1) for FD, FZ or FPE Modbus components;

0x0400 - flag2: not used at the moment;

0x0300 - command number (0-3):

- 0 == General Write;
- 1 == Zone Control;

- 2 == Device Control;
- 3 == Outputs Control;
-

0x00FF - bit masks for:

- When Zone Control is Performed then it is zone number from 0x01 (i.e. Zone#1) to 0x32 (i.e. Zone#50 Maximum per panel);
- When General Write is Performed:
  - 01 == Stop beeper;
  - 02 == Reset Fire;
  - 04 == Go to Fire2 mode;
  - 10 == Start/Stop Siren;
  - 20 == Increase time fire phase 1-fire phase 2;
- When Device or Output Control is Performed, MSbit of the last byte defines loop : 0==loop1, 1==loop2:
  - 81 == Loop2 Addr.1 Device;
  - 01 == Loop1 Addr.1 Device;
  - Etc.

The Modbus Master synchronize the time and date with the IFS7000 system through the Holding registers #2 to Holding registers #5. The meaning of each Holding register is described in the Modbus table p.3.1.

When the panel is set then all the panels in the network will update its date and time.

4. Verification

4.1. Modbus verification

UniPOS Test application is available for Modbus map validation:

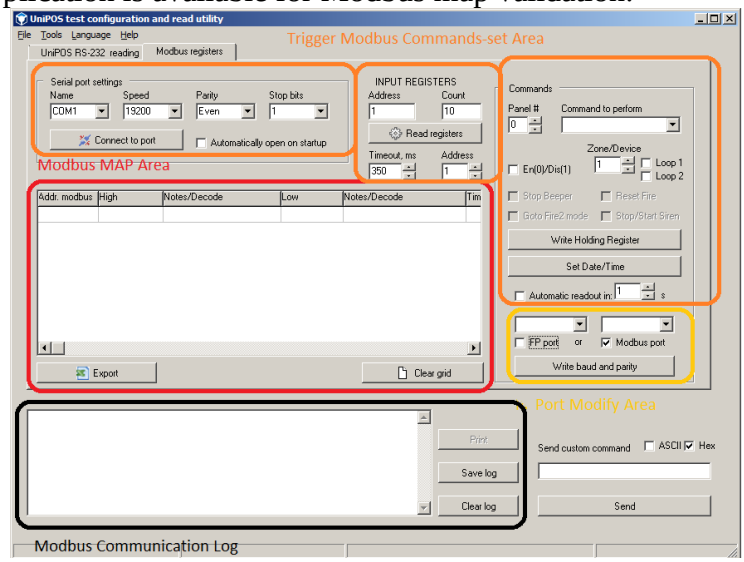


fig.3

Steps for module StartUp:

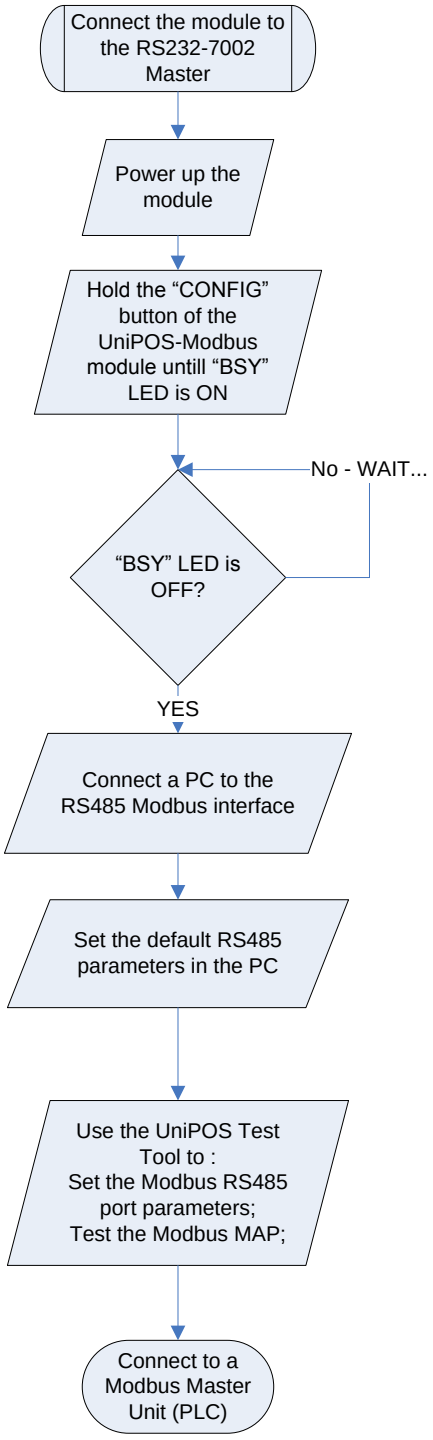


fig.4

In order to apply Step#1 you need a cross cable pin-out with DB9 connector:

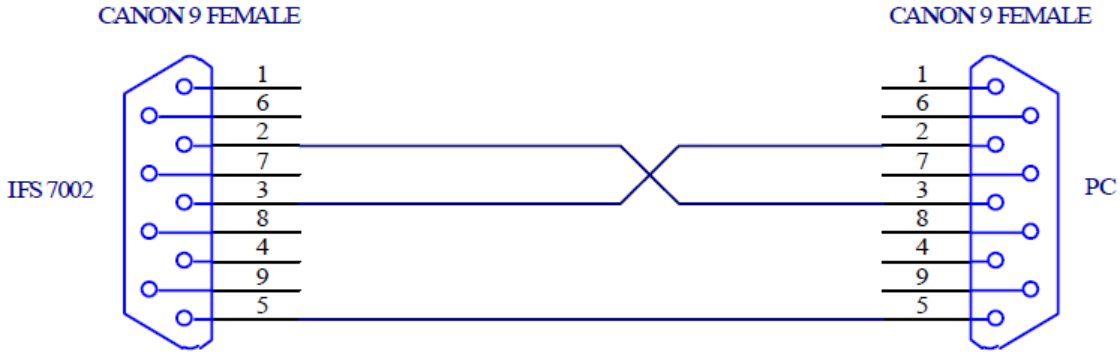


fig.5

The 7002 default communication parameters must be verified form menu 'Setup > Panel parameters > Network' :

Communication Speed : 2400

Panel address : 1234

In order to apply Step#2 you need to verify the following default RS485 parameters :

Communication speed : 19200 b/s (default), optional;

RS485 configuration :

info bits : 8,

parity : even,

stop bits : 1;

The RS485 speed and parity are optional - modify these parameters using the UniPOS Test tool - from the "Port modify Area" marked on fig.4

In order to Apply Step#3 you need the UniPOS Test tool :

Refer it from the Installation CD in the module's package.

From the UniPOS Test tool you are able to apply (fig.4):

- Pre-set Modbus commands from the "Trigger Modbus Commands-set Area" and sniff them in the "Modbus communication log" area;
- Change baud and parity from the "Port Modify Area";
- Check the Modbus Input registers status in the "Modbus Map Area";

5. Warranty

The warranty period is 24 months from the date of sale providing that the installation requirements have been observed.

The manufacturer does not bear warranty liabilities for damages, caused through accidental mechanical damages, misuse, adaptation or modification after production.

6. Annex 1

Code	Contenct	Modbus element	"State"	Param.#1	Param.#2	Param.#3	Param.#4
		Status	bit 0 in bInOut	(bZone)	(bLoop)	(bAddr)	(bAddrL)
1	mResetFire, "Reset fire",	not applicable					
2	mFire, "Fire",	FD fire status FD, bit#6		Zone number	Loop number	Address number	
3	mFire1, "Fire phase 1",	FD fire status FD, bit#6		Zone number	Loop number	Address number	
4	mFire2, "Fire phase 2",	FZ fire status FZ, bit#5		Zone number			
5	mFire2A, "Fire phase 2",	FD fire status FD, bit#6		Zone number	Loop number	Address number	
6	mPreFire, "Pre-fire",	FD fire status FD, bit#6	Yes	Zone number	Loop number	Address number	
7	mActivatedInput, "Activated Input",	FPE#1,bit or FPE#2 or FAD fire status FPE#1,bit6 or FPE#2,bit6 or FAD,bit6	Yes		Loop number	Address number	Номер Входа
8	mTestZone, "Zone in Test",	FZ test status FZ, bit#1	Yes	Zone number			
9	mDisableZone, "Disabled zone",	FZ disable status FZ, bit#3	Yes	Zone number			
10	mDisableDevice,	FD disable status	Yes	Zone number	Loop number	Address number	

	"Disabled device",	FD, bit#3					
11	mDisableMtrOutput, "Disabled monitored output",	not applicable	Yes			Address number	
12	mDisableAddrOutput, "Disabled addr. output",	FPE#1,bit or FPE#2 or FAD disable status FPE#1,bit3 or FPE#2,bit3 or FAD,bit3	Yes		Loop number	Address number	
13	mDisableAddrInpitOutput, "Disabled addr. Input/output",	FPE#1,bit or FPE#2 or FAD disable status FPE#1,bit3 or FPE#2,bit3 or FAD,bit3	Yes		Loop number	Address number	
14	mDisableAddrInput, "Disabled addressable input",	not applicable	Yes		Loop number	Address number	
15	mOpenLoop, "Open loop",	FAP fault in loop FAP, bit#5 or bit#6	Yes		Loop number		
16	mOpenPowerLoop, "Open Power line",	FAP fault status FAP, bit#2	Yes				
17	mShortLoop, "Short Signal loop",	FAP fault in loop FAP, bit#5 or bit#6	Yes		Loop number		
18	mShortPowerLoop,	FAP fault status	Yes				

	"Short Power line",	FAP, bit#2					
19	mFaultZone, "Fault in Zone",	FZ fault status FZ, bit#2	Yes	Zone number			
20	mRemovedDevice, "Removed device",	FD link-lost status FD, bit#4	Yes	Zone number	Loop number	Address number	
21	mFaultDevice, "Fault in device",	FD fault status FD, bit#2	Yes	Zone number	Loop number	Address number	
22	mDirtySensor, "Dirty sensor",	FD fault status FD, bit#2		Zone number	Loop number	Address number	
23	mCRCError, "Communication error",	FD fault status FD, bit#2	Yes	Zone number	Loop number	Address number	
24	mNotInitialized, "Uninitialized address",	FD fault status FD, bit#2	Yes	Zone number	Loop number	Address number	
25	mNewDeviceID, "Different device ID",	FD fault status FD, bit#2	Yes	Zone number	Loop number	Address number	
26	mNewDeviceType, "Different device Type",	FD fault status FD, bit#2	Yes	Zone number	Loop number	Address number	
27	mNewDeviceClass, "Different device class",	FD fault status FD, bit#2	Yes	Zone number	Loop number	Address number	
28	mDevSwap,	FD fault status		Zone number	Loop number	Address number	

	"Swap device",	FD, bit#2					
29	mInsolator, "Isolator On",	FD fault status FD, bit#2	Yes	Номер Зона	Loop number	Address number	
30	mPowerLoopInsolator, "Power line Isolator on",	FPE or FAD fault status FD, bit#2	Yes		Loop number	Address number	
31	mShortAddrOutput, "Short addr. output",	not applicable					
32	mOpenAddrOutput, "Open addr. output",	not applicable					
33	mShortMtrOutput, "Short monitored input",	FAP fault status FAP, bit#2	Yes			Address number	
34	mOpenMtrOutput, "Open Monitored input",	FAP fault status FAP, bit#2	Yes			Address number	
35	mFaultEarth, "Fault Earth",	FAP fault status FAP, bit#2	Yes				
36	mFaultMainPower, "Fault Main Power",	FAP fault status FAP, bit#2	Yes				
37	mFaultBattery, "Fault Battery",	FAP fault status FAP, bit#2	Yes				
38	mFaultAuxiliaryPower,	FAP fault status	Yes				

	"Fault Aux. Power supply",	FAP, bit#2					
39	mFaultInternalPower, "Fault internal power supply",	FAP fault status FAP, bit#2	Yes				
40	mBatteryLow, "Battery Low",	FAD fault status FAD, bit#2	Yes	Zone number	Loop number	Address number	
41	mFaultModule0, "Fault Module 0",	FAP fault status FAP, bit#2	Yes				
42	mFaultModule1, " Fault Module 1",	FAP fault status FAP, bit#2	Yes				
43	mFaultModule2, " Fault Module 2",	FAP fault status FAP, bit#2	Yes				
44	mFaultModule3, " Fault Module 3",	FAP fault status FAP, bit#2	Yes				
45	mEEPROM_Fault, "EEPROM Fault",	FAP fault status FAP, bit#2	Yes				
46	mLoopReset, "Uninitialized Loop",	FAP fault in loop FAP, bit#5 or bit#6	Yes		Loop number		
47	mWatchdogReset, "Watchdog Reset",	FAP fault status FAP, bit#2					
48	mResetPanel,	not applicable					

	"Restart Panel",						
49	mManualSet, "Enter Setup Mode",	FAP setup status FAP, bit#3					
50	mRemoteSet, "Remote Setup",	FAP setup status FAP, bit#3					
195	mDeactInput, "Input not active",	FPE#1 or FPE#2 or FAD input status FPE#1,bit6=0 or FPE#2,bit6=0 or FAD,bit6=0					
241	mMoreDeviceLoop, "More devices on the loop",	FAP fault in loop FAP, bit#5 or bit#6	Yes		Loop number		
242	mUndefinedAddrLoop, "Devices in excess",	Not applicable	Yes		Loop number		
248	mCAN_Fault, "CAN error",	Not applicable					
249	mCANError, “CAN error",	Not applicable	Yes			Remote panel number	
254	mNoneBattery, "None battery"	FAD fault status FAD, bit#2	Yes	Zone number	Loop number	Address number	

7. Annex 2

7.1. Input registers:

7.1.1 Addresses from loop

- Addresses per panel:

1 - 125 -> addresses (1-250) for panel 0 (local connected panel)
126 - 250 -> addresses (1-250) for panel 1 (remote panel)
251 - 375 -> addresses (1-250) for panel 2 (remote panel)
376 - 500 -> addresses (1-250) for panel 3 (remote panel)
501 - 625 -> addresses (1-250) for panel 4 (remote panel)
626 - 750 -> addresses (1-250) for panel 5 (remote panel)
751 - 875 -> addresses (1-250) for panel 6 (remote panel)
876 - 1000 -> addresses (1-250) for panel 7 (remote panel)
1001 - 1125 -> addresses (1-250) for panel 8 (remote panel)
1126 - 1250 -> addresses (1-250) for panel 9 (remote panel)
1251 - 1375 -> addresses (1-250) for panel 10 (remote panel)
1376 - 1500 -> addresses (1-250) for panel 11 (remote panel)
1501 - 1625 -> addresses (1-250) for panel 12 (remote panel)
1626 - 1750 -> addresses (1-250) for panel 13 (remote panel)

No limit on the number of Read register;

Values in register's MSB/LSB – the values in the registers depend on the type of the device on the corresponding address.

Note1: The type is coded in bit#0 & bit#1 for each position;

Note2: The 2Bytes Input register is divided so that the MSB refers address (n), while the LSB refers address (n+1);

- FD – Fire detector: optical-smoke (7130), temperature (7110/7120), combined (7160), Manual Call Point (7150), Conventional interface unit (7201 / 7201S);

  bit#7 – the address from the loop is occupied (bit#7=1);
  bit#6 - FD device is in Fire (bit#6=1);
  bit#5 – not applicable for this FD type of device;
  bit#4 – no communication with this address of the loop (bit#4=1);
  bit#3 – the FD device is Enabled(bit#3=0) / Disabled (bit#3=1);
  bit#2 – the FD device is in Fault (bit#2=1);
  bit#1 – == '0' for FD type of the Modbus component;
  bit#0 – == '0' for FD type of the Modbus component;

- FPE – input/output modules 3ins/5outs(7203), 10ins/16outs(7203O);

  bit#7 - the address from the loop is occupied (bit#7=1);
  bit#6 - FPE device is with activated Input (bit#6=1);

  Additional info for the number of the activated input is located in the FPE#1 and FPE#2 bytes of the Modbus mapping.
  bit#5 - FPE is with activated output (bit#5=1);
  Additional info for the number of the activated output is located in the FPE#1 and FPE#2 bytes of the Modbus mapping.
  bit#4 – no communication with this address of the loop (bit#4=1);

  bit#3 – the FPE device is Enabled (bit#3=0) / Disabled (bit#3=1);
  bit#2 – the FPE device is in Fault (bit#2=1);
  ==========
  bit#1 – == '1' for FPE#1 type of the Modbus component;
  bit#0 – == '0' for FPE#1 type of the Modbus component;
  or
  bit#1 – == '1' for FPE#2 type of the Modbus component;
  bit#0 – == '1' for FPE#2 type of the Modbus component;

- FAD – sounder (7204), module 1in/1out (7203IO), module 1 out (7203R, 7203OC);

  bit#7 - the address from the loop is occupied (bit#7=1);
  bit#6 – the FAD device is with activated input (bit#6=1) – relevant only to module 7203IO;
  bit#5 - FAD device is with activated output (bit#5=1) – relevant to each of the FAD device listed above;
  bit#4 – no communication with this address of the loop (bit#4=1);
  bit#3 – the FAD device is Enabled (bit#3=0) / Disabled (bit#3=1);
  bit#2 – the FAD device is in Fault (bit#2=1);
  bit#1 – == '0' for FAD type of the Modbus component;
  bit#0 – == '1' for FAD type of the Modbus component;

7.1.2 zones

The 2Bytes Input register is divided so that the MSB refers zone (n), while the LSB refers zone (n+1);

registers 1751 - 1775 -> zones(1-50) for panel 0 (local connected panel)
registers 1776 - 1800 -> zones(1-50) for panel 1 (remote panel)
registers 1801 - 1825 -> zones(1-50) for panel 2 (remote panel)
registers 1826 - 1850 -> zones(1-50) for panel 3 (remote panel)

registers 1851 - 1875 -> zones(1-50) for panel 4 (remote panel)
registers 1876 - 1900 -> zones(1-50) for panel 5 (remote panel)
registers 1901 - 1925 -> zones(1-50) for panel 6 (remote panel)
registers 1926 - 1950 -> zones(1-50) for panel 7 (remote panel)
registers 1951 - 1975 -> zones(1-50) for panel 8 (remote panel)

registers 1976 - 2000 -> zones(1-50) for panel 9 (remote panel)
registers 2001 - 2025 -> zones(1-50) for panel 10 (remote panel)
registers 2026 - 2050 -> zones(1-50) for panel 11 (remote panel)
registers 2051 - 2075 -> zones(1-50) for panel 12 (remote panel)
registers 2076 - 2100 -> zones(1-50) for panel 13 (remote panel)

No limit on the number of Read register;

Values in register's MSB/LSB:

bit7	6	5	4	3	2	1	bit0
On/Off	Fire1	Fire2	Link lost	Enable/Disable	Fault	Test	not used

bit#7 – the zone is located (bit#7=1);
bit#6 - FZ is in status Fire phase 1 (bit#6=1);
bit#5 - FZ is in status Fire phase 2 (bit#5=1);
bit#4 – no communication with the relevant panel belonging the zone (bit#4=1);
bit#3 – FZ is Enabled (bit#3=0) / Disabled (bit#3=1);
bit#2 – FZ is in fault (bit#2=1);
bit#1 – FZ is in Test (bit#1=1);
bit#0 – not in use;

7.1.3 fire panel state

Register 2101 -> panel 0 (local connected panel) & panel 1 (remote panel)
Register 2102 -> panel 2 (remote panel) & panel 3 (remote panel)
Register 2103 -> panel 4 (remote panel) & panel 5 (remote panel)
Register 2104 -> panel 6 (remote panel) & panel 7 (remote panel)
Register 2105 -> panel 8 (remote panel) & panel 9 (remote panel)
Register 2106 -> panel 10 (remote panel) & panel 11 (remote panel)
Register 2107 -> panel 12 (remote panel) & panel 13 (remote panel)

No limit on the number of Read register;

Values in register's MSB/LSB:

bit7	6	5	4	3	2	1	bit0
On/Off	Loop1 init	Loop2 Init	Link lost	Setup mode	Fault	Syst operations mode	Fire

bit#7 – a 7002 panel is located (bit#7=1);
bit#6 - Loop 1 is in fault (bit#6=1);

Faults : short-circuit loop, open loop, Uninitialized loop;
bit#5 - Loop 2 is in fault (bit#5=1);
Faults : short-circuit loop, open loop, Uninitialized loop;

bit#4 – no communication with the relevant panel (bit#4=1);
bit#3 – the panel is in Set-up mode. Therefore faults and fires can not be detected (bit#3=1);
bit#2 – the panel is in fault state (bit#2=1);
bit#1 – the panel is Resetted (bit#1=1) – exit from setup-mode;
bit#0 – the panel is in fire state (bit#0=1);

7.1.4 FPE#1 bit-set in the additional info byte dedicated to the 10input-16output module 72030

2 Inputs registers = 4 Bytes per FPE#1 unit;

registers 2108 - 2136 -> 14 pcs. modules type FPE#1;

No limit on the number of Read register;

Values in registers:

Input Register 1

bit15	14	13	12	11	10	9	bit8
Not used	Not used	Not used	Not used	Not used	Not used	In10	In9
bit7	6	5	4	3	2	1	bit0
In8	In7	In6	In5	In4	In3	In2	In1

Input Register 2

bit15	14	13	12	11	10	9	bit8
Out16	Out15	Out14	Out13	Out12	Out11	Out10	Out9
bit7	6	5	4	3	2	1	bit0
Out8	Out7	Out6	Out5	Out4	Out3	Out2	Out1

7.1.5 FPE#2 bit-set in the additional info byte dedicated to the 3input-5output module 72030

The 2Bytes Input register is divided so that the MSB refers FPE#2 (n), while the LSB refers FPE#2 (n+1);

registers 2137 - 2276 -> 140 pcs. modules type FPE#2;

No limit on the number of Read register;

Values in register's MSB/LSB:

bit7	6	5	4	3	2	1	bit0
Out5	Out4	Out3	Out2	Out1	In3	In2	In1

7.1.6 System events registers:

register 5000 > Info byte for the maximum capacity of the buffer and the current number of not-processed event-codes:

Read 1Input register only;

Values in register's MSB/LSB:

LSB is the maximum size of the event-code buffer;
MSB is the number of not processed event-codes;
The event-codes are processed through the Input Registers 5001 and 5002.

Registers 5001 and 5002 > details for the event code - source and type of the event:

Read 2 Input register only;

Values in registers:

31 28	27 24	23	22	21 16
unused read 0	PANEL	EN/ EX	UR	ZONE

15	14 8	7 0
LOOP	DEVICE ADDRESS	FAULT CODE

Input register 5001, 5002:

Bits 0-7 (first byte) - fault code (from evet-table in Annex 1);
Bits 8-15 (second byte) - device address (1-125), if bit 15 is set - device is in loop 2 (MSBit is loop bit)
Bits 16-21 (third byte) - zone
Bit 22 (third byte) - fault not yet read - should always be 1, if 0 - program error
Bit 23 (third byte) - enter (1) or exit (0) fault
Bits 24-27 (fourth byte) - panel number
Bits 28-31 (fourth byte) - unused

7.2. Holding registers

7.2.1 Commands to the System:

register 1 > Commands to System IFS7000

Values in registers:

Write 1 Holding register only

Mask 0xF000 - panel number (0-15, used 0-13) :

- panel 0 = local panel;
- panel 1 – panel 13 are the 13 pcs. remote panels networked to the local panel;

Mask 0x0800 - flag: enable(0)/disable(1) for FD, FZ or FPE Modbus components;

Mask 0x0400 - flag2: not used at the moment;

Mask 0x0300 - command number (0-3):

- 0 == General Write;
- 1 == Zone Control;
- 2 == Device Control;
- 3 == Outputs Control;
-

Mask 0x00FF - bit masks for:

- When Zone Control is Performed then it is zone number from 0x01 (i.e. Zone#1) to 0x32 (i.e. Zone#50 Maximum per panel);
- When General Write is Performed:
  - 01 == Stop beeper;
  - 02 == Reset Fire;
  - 04 == Go to Fire2 mode;
  - 08 == Increase time fire phase 1-fire phase 2;
  - 10 == Start/Stop Siren;
- When Device or Output Control is Performed, MSbit of the last byte defines loop : 0==loop1, 1==loop2:
  - 81 == Loop2 Addr.1 Device;
  - 01 == Loop1 Addr.1 Device;
  - Etc.

7.2.2 Time Synchro

register 2 – 5:
Read or Write 4 Holding register only;

Values in registers:

Holding register 2 – MSB = Seconds;
LSB = Minutes;
Holding register 3 – MSB = Hour;
LSB = Day of Week;
Holding register 4 – MSB = Day;
LSB = Month;
Holding register 5 – MSB = Year;
LSB = Not used;

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