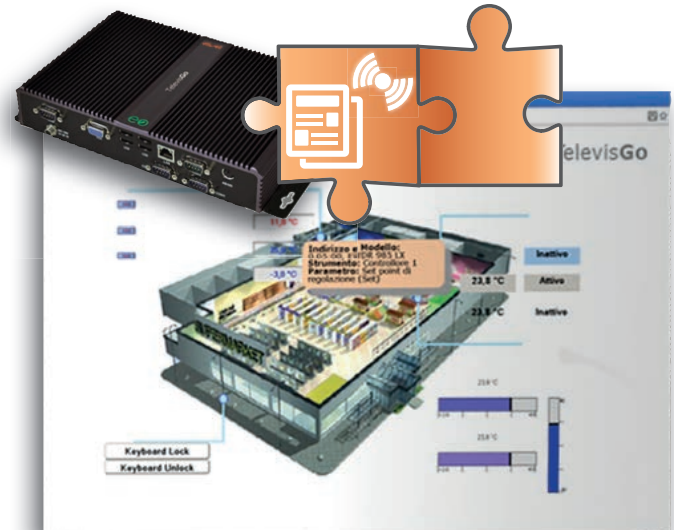


Monitoring of compressor rack energy consumption

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- INSTALLATION OF ALGORITHM..... 2
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DEFINITIONS AND COMPATIBLE RELEASES

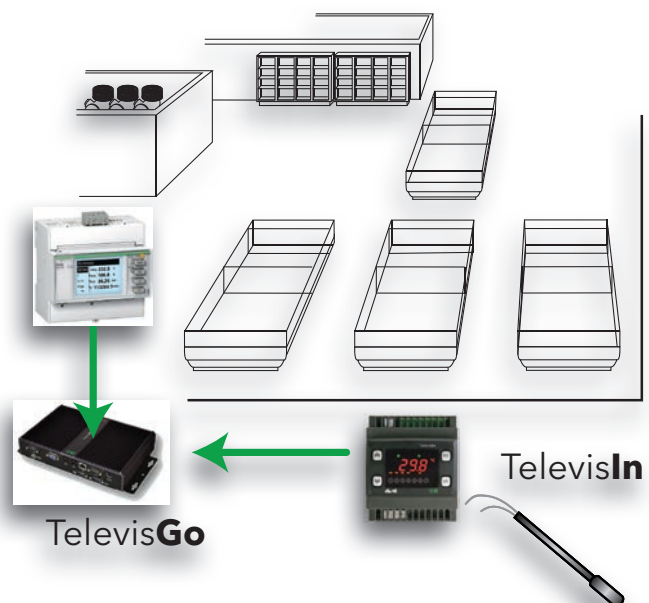
- **TelevisGo** is the Embedded PC platform by Eliwell: a monitoring and supervision system with web interface.
- **TelevisGo is a system that can be expanded with plug&play algorithms**
- **Instance:** Each algorithm can be instantiated; each instance is represented as a virtual instrument
- **Release:** version of ModBUS Energy Meter instruments managing plug&play algorithms
- **Pattern:** reference model for generation of alarms in the event of deviation from standard. The model is represented by pairs of values reflecting system energy consumption (kWh) and temperature (°C)

INSTALLATION OF COMPONENTS

The **Energy Pattern Deviation Alert** application compares the reference model (**pattern**) with the pair of values:

1. energy consumption of the system over **24h**, measured by an energy meter
2. average external temperature, measured by a **TelevisIn** module

and generates an alarm in the event of a deviation from the specified model. The model can be defined by a maximum **20 pairs** of reference values. The algorithm also establishes an energy threshold beyond which an energy consumption out of range warning is generated.



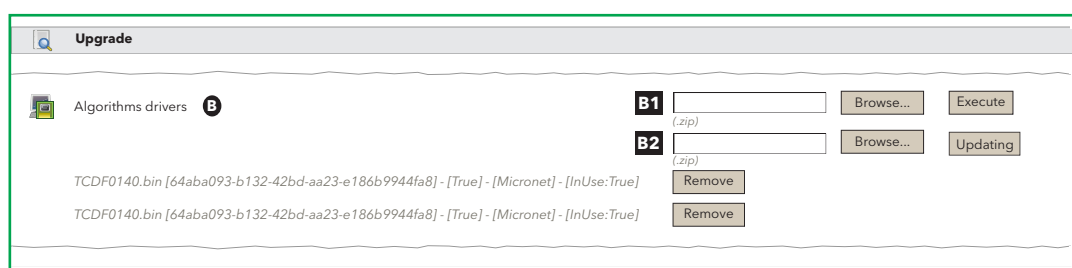
External temperatures

INSTALLATION OF ALGORITHM

The **Energy Pattern Deviation Alert** algorithm, identified by **1028_EnergyPatternDeviationAlert.zip**, is a .zip file that can be downloaded from the Eliwell website after registering at the following link <http://www.eliwell.it/filedownload.aspx?id=25485>
 path: Eliwell > Home > Technical Support > Software Download > TelevisGo

Enter the following menu¹ to load or update an algorithm:

 **Computer** →  **Update**




Section **B** is where the **algorithm drivers** are stored; from here, it is possible to load a new algorithm or update the driver of an algorithm already loaded.

Loading an algorithm

To load a new algorithm, press Browse in line **B1**, scroll through the folders (directories) to locate the file **1028_Energy Pattern Deviation Alert.zip** and select it. Clicking **Run**, the software automatically opens the Algorithms window (see Algorithm selection).

Updating an algorithm

To update a driver of an algorithm already loaded, press Browse in line **B2**, scroll through the folders (directories) to locate the file, and select it. Clicking Update, the software automatically opens the Algorithms window.

NOTE: an attempt to load an algorithm already present in line **B1** will generate the message "The algorithm is already present". Use **Update** to replace it with the new version preceded by the  icon.

N.B: before updating an algorithm, it is advisable to save the relative current parameters map using the menu:

Functions » Parameters » <algorithm selection> <select label> » Save map

¹ To access this section, data logging must be suspended

ACTIVATION

To select the instances of the algorithms currently loaded, access the following menus in sequence:

 **Settings** →  **Interfaces** →  **Algorithms**

The list of all previously loaded algorithms and the relative settings is shown here

Interface	ID	Address	Devices			
Algorithms	998	127.0.0.1	9			
Address	Description	Alias	Model	Period	Input	
<input type="checkbox"/> 00:01	998.00:01 CentralizedDevPoint		1027	60	00	
<input type="checkbox"/> 01:00	998.01:00 FloatingSuction		1025	60	00	
<input type="checkbox"/> 01:01	998.01:01 FloatingSuction		1025	60	00	
<input type="checkbox"/> 01:02	998.01:02 FloatingSuction		1025	60	00	
<input type="checkbox"/> 01:03	998.01:03 FloatingSuction		1025	60	00	
<input type="checkbox"/> 02:00	998.02:00 PressureInputBackup		1026	60	00	
<input type="checkbox"/> 02:01	998.02:01 PressureInputBackup		1026	60	00	
<input checked="" type="checkbox"/> 03:00	998.03:00 EnergyPatternDeviationAlert		1028	300	000	
<input checked="" type="checkbox"/> 03:01	998.03:01 EnergyPatternDeviationAlert		1028	300	000	

The colours of the lines that will appear have the following meanings:

- **green:** new algorithm found in the virtual network
- **black:** algorithm **already present** in the virtual network

The value of the address and model linked to each algorithm instance is assigned automatically by the application.

The maximum number of instances per algorithm is **2**

The value of the **Period** displayed indicates the run time (or cycle period).

The period, expressed in seconds, can take on a value between 60 (1 minute) and 86400 (1 day).

The current value of the cycle period can be changed by entering the desired value.

Tick the checkbox on the left of the address to select the algorithm instances that will be enabled, and press **Save** to store their configuration.

Contents

Accessing the menu: **Settings » Interfaces » Summary** the user can check which algorithms are present.

Address	Description	Resources
00:01	998.00:01 CentralizedDevPoint	10
01:00	998.01:00 FloatingSuction	35
02:00	998.02:00 PressureInputBackup	10
03:00	998.03:00 EnergyPatternDeviationAlert	19

Description	Name (short)	Alarm delay
PLC cycle duration	INP00122	
Energy consumption - current value	INP00130	
Energy consumption - last hour	INP00131	
Energy consumption - last day	INP00132	
External temperature - current value	INP00133	
External temperature - last hour	INP00134	
External temperature - daily average	INP00135	
PLC run	STA00381	
PLC error code	STA00382	
PLC cycle counter	STA00384	
PLC cycle time exceeded	ALM00334	0
PLC error	ALM00315	0
Energy consumption out of range	ALM00342	0
Energy consumption check time not defined	ALM00343	0
Number of Temperature/Energy pairs not defined	ALM00344	0
Temperature sensor fault	ALM00345	0
Energy sensor fault	ALM00346	0
No link	ALM00300	0
Device Changed	ALM00201	0

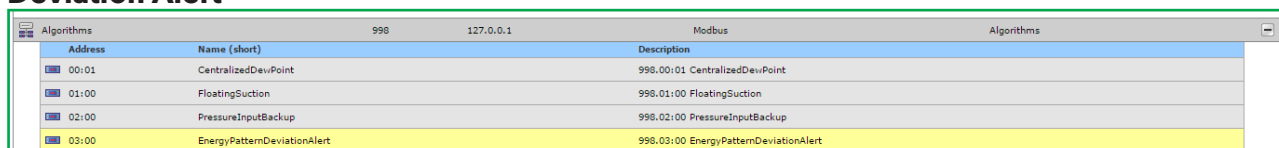
TeleviGo Application Notes

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TELEVISGO CONFIGURATION

The selectors must be set correctly: an essential step if correct operation of the algorithm is to be guaranteed.

From the menu **Functions » Parameters » Step 1** select the algorithm **Energy Pattern Deviation Alert**



Address	Name (short)	Description
00:01	CentralizedDevPoint	998.00:01 CentralizedDevPoint
01:00	FloatingSuction	998.01:00 FloatingSuction
02:00	PressureInputBackup	998.02:00 PressureInputBackup
03:00	EnergyPatternDeviationAlert	998.03:00 EnergyPatternDeviationAlert

Click on the line (highlighted yellow) of the **Energy Pattern Deviation Alert** algorithm to access the following page, **Functions » Parameters » Step 2**

The screen shows the parameters of the selected instrument.

	Label	Description	UM	Min	Max	Default	Device	Input
<input type="checkbox"/>	filter0	Selector of the TeleviIn module		0	1	view		
<input type="checkbox"/>	filter1	Selector temperature probe from TeleviIn		1	1	view		
<input type="checkbox"/>	filter2	Selector energy meter		0	1	view		
<input type="checkbox"/>	filter3	Selector energy meter sensor		1	1	view		
<input type="checkbox"/>	Version	Version		1	1	1		
<input type="checkbox"/>	CheckHour	Energy consumption check time	h	0	24	24		
<input type="checkbox"/>	PairSTE	Number of Temperature/Energy pairs		0	20	0		
<input type="checkbox"/>	T01	External temperature 1	°C	-20	50	0		
<input type="checkbox"/>	E01	Energy consumption 1	kWh	0	1000	0		
<input type="checkbox"/>	T02	External temperature 2	°C	-20	50	0		
<input type="checkbox"/>	E02	Energy consumption 2	kWh	0	1000	0		
<input type="checkbox"/>	T03	External temperature 3	°C	-20	50	0		
<input type="checkbox"/>	E03	Energy consumption 3	kWh	0	1000	0		
<input type="checkbox"/>	T04	External temperature 4	°C	-20	50	0		
<input type="checkbox"/>	E04	Energy consumption 4	kWh	0	1000	0		
<input type="checkbox"/>	T05	External temperature 5	°C	-20	50	0		
<input type="checkbox"/>	E05	Energy consumption 5	kWh	0	1000	0		
<input type="checkbox"/>	T06	External temperature 6	°C	-20	50	0		
<input type="checkbox"/>	E06	Energy consumption 6	kWh	0	1000	0		
<input type="checkbox"/>	T07	External temperature 7	°C	-20	50	0		
<input type="checkbox"/>	E07	Energy consumption 7	kWh	0	1000	0		
<input type="checkbox"/>	T08	External temperature 8	°C	-20	50	0		
<input type="checkbox"/>	E08	Energy consumption 8	kWh	0	1000	0		
<input type="checkbox"/>	T09	External temperature 9	°C	-20	50	0		
<input type="checkbox"/>	E09	Energy consumption 9	kWh	0	1000	0		
<input type="checkbox"/>	T10	External temperature 10	°C	-20	50	0		
<input type="checkbox"/>	E10	Energy consumption 10	kWh	0	1000	0		

TelevisGo Application Notes

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Description	Min	Max	Factory setting	Settings selected by the user
TelevisIn module selector	0	1	TelevisIn*	Specify the address if there are multiple TelevisIn devices
Selector temperature probe from TelevisIn	1	1	INP40001-1	Change if a probe other than PB1 is used: INP40001-1 TelevisIn PB1 INP40001-2 TelevisIn PB2 INP40001-3 TelevisIn PB3 INP40001-4 TelevisIn PB4 INP40001-5 TelevisIn PB5
Selector energy meter	0	1	MODEL	Model, name, address e.g. Schneider-Electric PM3250: model= "*Schneider-Electric*PM3250*"
Selector energy meter sensor	1	1	DESCRIPTION	Identifier, resource name e.g. PM3250: Id="INP40000-Power"
Application version	1	1		x read only
Energy consumption check time	0	23	24	Set check time 24= disabled
Number of Temperature/Energy pairs	0	20	0	Set number of Temperature/Energy pairs 0= disabled, max 20 pairs
External temperature 1	-20	50	0	Set external temperature threshold value 1
Energy consumption 1	0	1000	0	Set energy consumption threshold value 1
External temperature ..	-20	50	0	Set external temperature threshold value ..
Energy consumption ..	0	1000	0	Set energy consumption threshold value ..
External temperature 20	-20	50	0	Set external temperature threshold value 20
Energy consumption 20	0	1000	0	Set energy consumption threshold value 20

The **Energy Pattern Deviation Alert** algorithm is preset with the aid of **instruments and resources to minimize the number of settings made by the user**

See **the UM column**, which shows an icon identifying the type of selector:

 **Instrument (device) selector**

rule for selection of instruments on which the algorithm works.

 **Input resource selector (subsidiary)**

rule for selection of input resource on which the algorithm works.

If selected, with a tick to the checkbox , this can be changed by clicking **set** in the column **Value input**.

To display the selector setting, click on **Copy from default**

Enter the required parameters (address, name, model) and **save**

To change the selector again, press **change** and repeat the procedure.

The default algorithm is configured to read the external temperature from probe 1 INP40001-1 **TelevisIn** PB1 in °C.

Check that the unit of measure set for **TelevisIn** is the same.

To view energy consumption, the user must specify:

1. the address or name of the energy meter utilized
2. the address of the ModBUS resource indicating present consumption.

The user must also set:

- the time when the check is run (**CheckHour** param)
- the number of temperature/energy samples (**PairsTE** param)
- and configure the pairs of Tnn/Enn values consecutively, starting from **T01/E01**, up to the total number **PairsTE**

Temperature values must be in °C and consistent with the setting for **TelevisIn**.

Note. The algorithm does not generate an error message for an incorrect configuration.

Once **24h** of data acquisition have elapsed following the start time, the algorithm will perform the following operations when the check is run:

- Computation of energy consumption for the current day
- Computation of average external temperature for the current day
- Identification of the External temperature **n** / External temperature **n+1** pairing in which the average external temperature occurs
- Verification whether or not energy consumption for the current day is greater than energy consumption **n+1**, updating the status of the **Energy consumption out of range** alarm.




















TelevisGo Application Notes

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<input checked="" type="checkbox"/>	CheckHour	Energy consumption check time	h	0	24	24		20
<input checked="" type="checkbox"/>	PairsTE	Number of Temperature/Energy pairs		0	20	0		2
<input checked="" type="checkbox"/>	T01	External temperature 1	°C	-20	50	0		20
<input checked="" type="checkbox"/>	E01	Energy consumption 1	kWh	0	1000	0		110
<input checked="" type="checkbox"/>	T02	External temperature 2	°C	-20	50	0		25
<input checked="" type="checkbox"/>	E02	Energy consumption 2	kWh	0	1000	0		120

In the example indicated, it will be seen that when the average temperature for the current day is between 20 and 25 °C, the compressor rack functions correctly as long as energy consumption for the current day is no higher than 120 kWh. In the event of this value exceeding 120 kWh, the **Energy consumption out of range** alarm will be tripped.

STATUS DISPLAY

Description	Notes
Energy Pattern Deviation Alert algorithm statuses	
 Energy consumption - current value	Most recent energy consumption value read
 Energy consumption - last hour	Most recent hourly energy consumption sample
 Energy consumption - last day	Energy consumption on previous day
 External temperature - current value	Most recent external temperature value read (°C)
 External temperature - last hour	Most recent hourly external temperature sample (°C)
 External temperature - daily average	Average external temperature on previous day (°C)
 Energy consumption out of range	Alarm indicating energy consumption above the set threshold
 Energy consumption check time not defined	Time of check on energy consumption has not been set (CheckHour param); select and set the time at which the check is to be run
 Number of Temperature/Energy pairs not defined	Number of temperature/energy pairs has not been set (PairsTE param); select and set the number of pairs
 Temperature sensor fault	External temperature sensing error
 Energy meter fault	Energy consumption metering error
PLC prefix: Preset algorithm diagnostics	
 PLC cycle duration	Duration of algorithm run
 PLC run	Algorithm running
 PLC error code	Algorithm error code
 PLC cycle counter	Algorithm run cycle counter
 PLC cycle time exceeded	Active if the cycle time of the algorithm exceeds the set value
 PLC error	Active if the PLC error code is other than 0 * (check)
Default resources associated with all instruments	
 No Link	Algorithm rendered inoperative by an internal blocking error (contact technical support)
 Device changed	not used

The commands **Start PLC** and **Stop PLC** are available and always present and visible in the panel **Functions » Commands**