



**User Manual**

# **STCU DS1-LOG**

**Reading master with display and  
datalogger for M-Bus devices**





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## INTRODUCTION

The STCU DS1 LOG is an M-Bus network hub, designed to gather data from connected meters and memorize it.

Saved logs may be read directly on the screen.

Alternatively, logs may be made using the "STCU Reader" user program, provided separately.

The device may be configured directly using the display or locally using the "STXM Reader" software.

The STCU DS1 LOG has a 1 MB memory dedicated to saving the readings. The duration of the memory depends mainly on the number of devices connected to the M-Bus network, and on the frequency of the readings. With 100 devices connected to the network, after 50 readings the memory will be completely full. At that point the new data will begin to overwrite the less recent data.

## TECHNICAL SPECIFICATIONS

- Power supply:
  - STCU-060-DS1-LOG 230Vac 50/60Hz, 15 W (Max.).
  - STCU-120-DS1-LOG 230Vac 50/60Hz, 20 W (Max.).
  - STCU-250-DS1-LOG 230Vac 50/60Hz, 35 W (Max.).
- M-Bus line status indicator led.
- USB port for local meter reading and configuration.
- Local reading by means of display or by means of PC and "STCU Reader" software.
- M-Bus Master Port (2400 Baud) protected against overload and short-circuits.
- 1 MB of memory for saving reading logs.
- Different models for readings for up to 60,120 or 250 devices. (expandable up to 500, by means of STAM amplifiers).
- Operational temperature: 0 – 45 °C.

## FUNCIONAL SPECIFICATIONS

- Meter and/or device reader with M-Bus interface.
- Saving of readings in the device's memory.
- Display for the configuration and visualization of the reading values.
- Logs which can be read by means of display or by means of PC and the dedicated software ("STCU Reader").
- Device configuration done by means of the provided display or locally by means of PC and "STXM Reader" software.
- The possibility of using up to two schedulers for the automatic execution of the logs on a daily, weekly or monthly basis, and for saving of the count values.
- The possibility of reading the device's instantaneous values by means of display or by means of PC and the dedicated software ("STCU Reader").

## DIMENSIONAL CHARACTERISTICS

- Color: Grey RAL 7035.
- Material: PPO self-extinguishing.
- Dimensions: 150mm x 200mm x 78mm.
- Protection: IP 66.

## PRODUCT CODE

- STCU-060-DS1-LOG Master M-Bus with display and datalogger for 60 meters (expandable up to 500 with STAM amplifiers).
- STCU-120-DS1-LOG Master M-Bus with display and datalogger for 120 meters (expandable up to 500 with STAM amplifiers).
- STCU-250-DS1-LOG Master M-Bus with display and datalogger for 250 meters (expandable up to 500 with STAM amplifiers).

## RELATED PRODUCTS

- ST-AM-120-01 Amplifier module for extending network to an additional 120 devices.
- ST-AM-250-01 Amplifier module for extending network to an additional 250 devices.
- ST-SWL-C01 Software for local reading of meters (STCU Reader).
- ST-SWC-C2 Software for local hub configuration (STXM Reader).
- SG-PRG-USB Mini USB B – USB A cable (provided).
- STCR-IO-001 M-Bus slave device with a relay output and an input.

For a complete list of products or updates, please visit [www.telelettura.it](http://www.telelettura.it).

## CONFORMITY TO REGULATION STANDARDS

- Low Voltage Directive.
- EMC Directive.

## SUPPORTED DEVICES

Currently the following meters are supported:

Manufacturer	Model
Zenner	ZELSIUS
	MULTIDATA S1
	MULTIDATA WR3
	IZM 972
	MULTIPULSE
	ZELSIUS C5
EngelMann	SensoStar 2C US
	SensoStar 2
Actaris	Integral-V MaXX
AR Therm	Excelsius
Siemens	WFN 21 e WFH 21
	AEW 310.2
	UH 50
	WFN 532
Relay	Padpulse M2
Qundis	G20
IME	CE4DT1 (M-Bus)
Aparator	ELF
Socomec	Countis E26

(Other devices, not included on the list, may have been added after the printing of this manual, or may be compatible even if not listed. Contact Sitec Srl to verify or add other devices).

## DATA LOGGER MODE

The device has two Data Logger automatic schedulers, independently programmable, which read and memorize the data of the meter readings, and allow the user to see them with the display or using the specific "STCU Reader" software.

## DATA LOGGER MEMORY

The STCU DS1 LOG has a memory dedicated to saving readings. As soon as a reading occurs, the data is immediately memorized to allow the user to see it at a later time.

The Data Logger memory has a 1 MB capacity. Should it be full, the old data is overwritten by the new, thereby losing the previously saved data.

A scheduler's use of the memory mainly depends on the number of meters connected to the M-Bus network and on the length of the frames from the single meters. Moreover, the more frequent the scheduler readings, the faster the memory depletion.

Example: There are 50 devices connected to a network, each of which has a 125 byte frame. We want to do a monthly scan. To calculate the number of scans that will use up all the memory, divide its capacity by the sum of the single frames; in this case, the formula is:  $50 \times 125 = 6225$  (to simplify things, we have assumed that all the meters provide equal length frames). This way, we are able to calculate the space occupied by a single log. Divide the memory capacity by the space occupied by a single log. Going back to the example, calculate  $1.000.000 / 6225 = 160$ . The 160 value indicates the number of scans necessary to deplete the memory space, in this example 160 months. To conclude, the formula for calculating the number of scans necessary for depleting the memory is as follows:

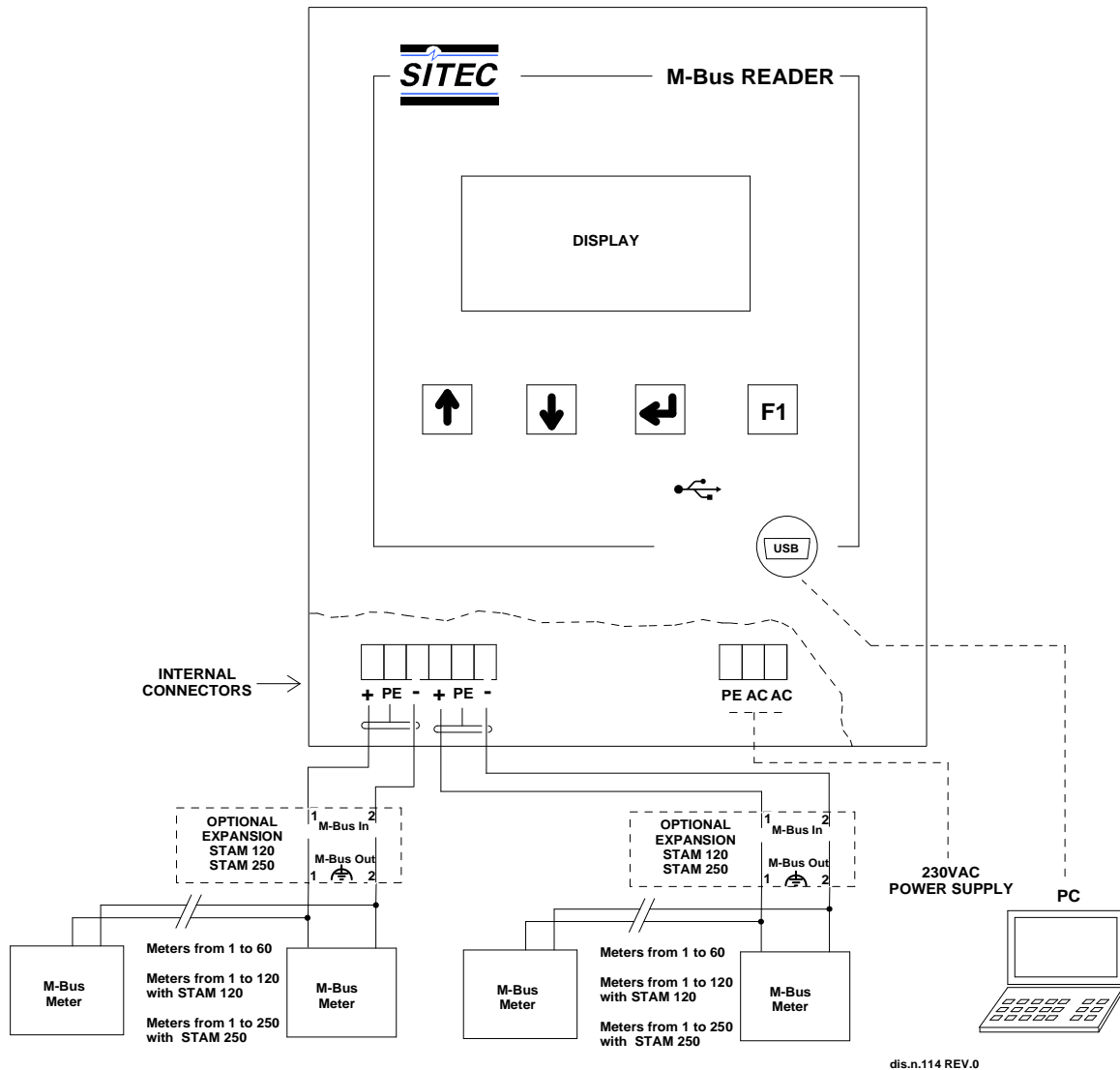
$$\text{Scans necessary} = \text{memory capacity} / (\text{Byte Frame 1} + \text{Byte Frame 2} + \dots + \text{Byte Frame N})$$

## DATA LOGGER SCHEDULER

The scheduler is an instrument which allows for executing an automatic log of all meters with a certain frequency which can be selected from these various alternatives:

- "Disabled": the scheduler is not active; therefore no data log will take place.
- "Daily": the scheduler executes one log per day, at the scheduled time.
- "One time only ": the scheduler executes a single log, on the chosen day of the month, at the scheduled time.
- "Weekly": the scheduler executes one log a week on the chosen day, at the scheduled time. Further, in this mode, you can choose which months to execute the scan.
- "Monthly": the scheduler executes one log a month on the desired date at the chosen hour. Further, in this mode you can choose which months to execute the scan.

# FRONT PANEL, TERMINAL BOX AND CONNECTION DIAGRAMS



## FRONT PANEL DESCRIPTION

- LCD Display.
- Keypad.
- USB Interface Connector.

## TERMINAL BOX DESCRIPTION

- 1) Device Power Supply
  - PE Ground.
  - AC 230VAC 50Hz Power Supply.
  - AC 230VAC 50Hz Power Supply.
- 2) Communication port with the M-Bus network
  - + (M-Bus).
  - PE M-Bus shielded cable (do not connect to ground).
  - - (M-Bus).

## INSTALLATION AND TESTING

- Place hub at least two meters from power devices (pumps, inverters, etc.).
- Fasten hub using the fastening supports inside the package.
- Make the connections following the directions in the chapter: “Front Panel, Terminal Box and Connection Diagrams”.
- Verify the insulation of the M-Bus cable with respect to the ground or other voltages.
- Verify there are no short-circuits in the wiring.
- Switch on the device and wait for the word “Wait...” to disappear on the screen.
- Verify that the “OVL” LED is off at the bottom right of the screen. Otherwise, check the ground wires and other voltages, and ensure that the network is free of short-circuits;
- Set up site name (see chapter “Site Set-up Menu”).
- Set up device time and date (See “Set Time/Date Set-Up” Menu).
- Create the list of devices (see chapter: “Device Search Menu”).
- Set the scheduler to the desired frequency to create logs automatically, (see chapter “Create Log Menu”).
- Alternatively, you can configure the device by using the “STXM Reader” software, which can be downloaded at the link at the end of this chapter. Consult the specific manual for further information.

### M-BUS WIRING

For the M-Bus wiring, refer to EN13757-2 (Annex E M-Bus Cable installation) and standards relating to the wiring of buildings.

To connect the meters to the master via the M-Bus network, we recommend using a twisted cable of at least 2x0.8 mm wires or equivalent (JYStY N\*2\*0.8 mm).

M-Bus cable must not be placed in the same conduit as the power cables.

We recommend respecting a distance of at least 2m from the inverter and other power devices in order to avoid possible electrical interference.

With the cable above the total length of the wired segment can be up to 2 km with 250 Unit Loads.





The shield must only be connected to the appropriate terminal of the concentrator base (see connection diagram), but must be opened by the side of the terminal for direct current (DC) and low-frequency signals.



## USE

The STCU DS1 LOG can be commanded directly through the keypad found under the display.

### KEYPAD

Key	Meaning	Description
	Enter	The "Enter" key is used to open the menu and start the selection processes.
	Up	The "Up" key is used for scrolling up in the menu, and for increasing the values inside specific menus.
	Down	The "Down" key is used for scrolling down in the menu and for decreasing the values inside specific menus.
	F1	The "F1" key is used for returning to the previous menu.

### SETTINGS MENU

Within this menu you can implement all of the device settings and operations. To enter the menu, from the start menu simultaneously press the [Up] and [F1] buttons. Particularly you can access the following sub-menus:

- Device Search: Create the list of devices connected to the M-Bus network.
- Brightness: Set up display brightness.
- Contrast: Set up display contrast.
- Create log: Create a manual log of meter data, independent of the scheduler.
- Scheduler 1: Set up Scheduler 1 with the desired frequency. Moreover, you can see the current configuration in use and the date of the next scheduler.
- Scheduler 2: Set Scheduler 2.
- Set Date/Time: Set system date and time;
- Set Site: Set name of device installation site.

The currently selected parameter is indicated by the hyphen next to it, as is shown in the image. In this example, the selected parameter is "Device Search". To enter the desired menu, just press the [Enter] key. To scroll through the various parameters in the menu, just press the [Up] or [Down] keys. To return to the previous menu, press [F1].

```
SETTINGS
-Device search
Brightness
<--:Select
```

### DEVICE SEARCH MENU

```
DEVICE SEARCH

X Found 10
Please wait...
```

To access this menu, from the settings menu, position the cursor on "Device Search" and press the [Enter] key. The search begins as soon as that button is pressed.

The number of meters revealed is continuously updated, as soon as new devices are found. Further, there is a variable character, designed to indicate the search status to the user; if the character continues to vary this indicates that the search is being executed properly; otherwise there is a problem within the device.

You cannot interrupt the device search. The process must complete itself before you can take back control of the display.

```
DEVICE SEARCH
  Search completed
    Found: 27
F1:Exit
```

When the search is complete, a screen similar to this image will appear, indicating the number of devices found. To see the list you must access the "Current Readings Menu".

## BRIGHTNESS MENU

To access this menu, from the "Settings" menu, select "Brightness" and press [Enter].

```
BRIGHTNESS
  UP:+ DOWN:-
F1:Exit
```

The screen that appears will be like the one here to the left. As indicated by the screen, press the [Up] button to increase the value, and [Down] to decrease it.

Finally, press [F1] to save the set parameter and return to the previous menu. Once the brightness is set up, it remains unchanged until a new set-up, even should the device gets turned off.

## CONTRAST MENU

To access this menu, from the "Settings" menu select "Contrast" and press [Enter].

```
CONTRAST
  UP:+ DOWN:-
F1:Exit
```

The screen that appears will be like the one here to the left. As indicated by the screen, press the [Up] button to increase the value, and [Down] to decrease it.

Press [F1] to save the set parameter and return to the previous menu. As with the Brightness, once the contrast is set up, it remains unchanged until a new set-up, even should the device gets turned off.

## CREATE LOG MENU

To access this menu, select it from the Settings Menu and press [Enter].

```
CREATE LOG
Log on progress
7 di 27 Executed
Please wait...
```

A reading of all the devices will be read and the data will then be saved to the hub's memory. The number of devices that have been read compared to the number of total devices, to indicate the status progress. Once the reading of all the meters connected to the M-Bus network is complete, for a few seconds the image shown here at the right will appear

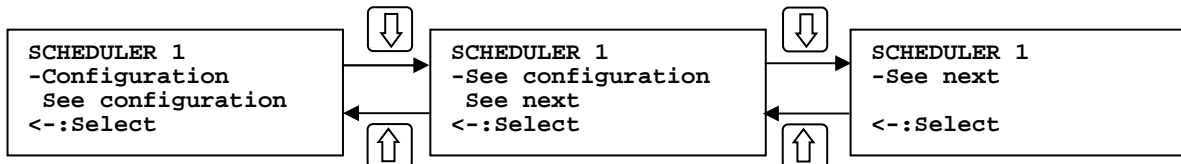
on the screen, to indicate to the user that the log has been created.

```
LOG
COMPLETED
```

## SCHEDULER MENU (1 AND 2)

Schedulers automatically create a data log according to the desired frequency. There are two schedulers, named "Scheduler 1" and "Scheduler 2." There are three sub-menus inside the relative menus:

- Configuration: used for the set-up of the relative scheduler. There is a separate chapter in this manual dedicated to setting up the schedulers;
- See Configuration: show the current scheduler configuration;
- See Next: informs the user of the day in which the next log will be created.



## CONFIGURATION MENU

This menu is used for setting up the two schedulers, which create the logs according to the desired frequency, able to be selected from the following:

Type	Description	Parameters to be set up
Disabled	No log	None
Single	One log	Month, day of the month, time
Daily	One log per day	Time
Weekly	One log per week	Week in which to perform the scan, day of the week and time
Monthly	One log per month	Month in which to perform the scan, day of the month and time

To enter the "Set up" menu, from the Scheduler menu choose the relative item and press [Enter]. Various parameters to set up are found inside that menu. Scroll through the menu using the [Up] and [Down] buttons, and press [Enter] to change the selected parameter. After having pressed [Enter], the parameter that you are changing will flash quickly to indicate that the changes are being made. From then on, using the [Up] and [Down] buttons will change the parameter itself, instead of move the cursor up and down in the menu. After having completed the set-up, press [Enter] again to render the change effective and return to scrolling through the parameters. Otherwise, press [F1] to return to the menu without saving the changes. In both cases, the end of a parameter change is indicated by another brief flash.

The only exception is for the "Months" parameter in the monthly and weekly scheduler. See the next paragraph for more information.

After having chosen the desired scheduler type, the parameters to set up will appear - depending to the type. See the table above to see the parameters for each type of scheduler.

After having made all the necessary settings choose the "Set up" menu to render all the settings effective.

### Months Parameter (monthly and weekly scheduler type)

After having selected the menu for showing the active months of the scheduler, the screen will look like the image below. Scroll through the months by using the [Up] and [Down] buttons. You can change the scheduling of the month you chose by pressing [Enter], if the scheduler for that month is enabled ("On"), pressing [Enter] will change it to disabled ("OFF") and vice-versa. After having completed the set-up, scroll down the screen to the "SAVE" and press [Enter] to render the changes active. Or, press [Exit] to return to the previous menu without changing the settings of that month.

```

MONTHS SCHEDULER 1
-January      ON
-February     ON
<-:Change
  
```

## SCHEDULER CONFIGURATION MENU

You can see the current scheduler configuration from inside this menu. To enter this menu from the Scheduler Menu, choose "See configuration" and press [Enter]. There is a series of parameters listed which describe the currently active scheduler. Scroll through the parameters to read using the [Up] and [Down] buttons. Press [Enter] in the "Month" parameter to see the months in which the scheduler is active. Press [F1] to return to the previous menu.

```
SCHEDUER 1 CONFIG
-Type: Montly
Months: All
F1:Exit
```

## NEXT SCHED MENU

You can see the date and time of the next scheduling in this menu. To enter this menu from "Scheduler" choose "See next" and press [Enter]. The resulting screen should be similar to the one shown here on the left. Finally, press [F1] to return to the previous menu. Should no scheduling be active, the screen will look like that one here on the right.

```
SEE NEXT SCHED 1
Day: 22/11/2014
Time: 15:00
F1:Exit
```

```
SEE NEXT SCHED 1
Day: --/--/----
Time: ---:--
F1:Exit
```

## SET DATE/TIME

You can set up the system date and time in this menu. This operation is necessary for making the scheduler work in the moment the user chooses. If the system clock is not set to the correct time, the scheduler would create the data logs in at the wrong time instead of that requested.

```
SET DATE AND TIME
Data: 01/01/2014
Ora: 09:00:00
F1:Esci
```

To access this menu, from the Settings Menu, choose the relative menu item and press [Enter]. The screen should look similar to that shown here, with the current time. The time setting process is divided into 6 phases, each of which sets one of the values. Pressing [Enter] completes the set-up and moves onto the next one. Each time you change a parameter it flashes quickly to let you

know that the set-up is in process. Using the [Up] and [Down] you increase or decrease the selected parameter. The set-up order is as follows:

- Day of the month;
- Month;
- Year;
- Hour;
- Minute;
- Second;

Once you've completed the set-up of the seconds, pressing [Enter] confirms the time set-up and returns to the "Settings" menu. Instead, press [F1] to return to the previous menu without saving the time set up.

## SITE SET UP

You can set up the name of the device installation site in this menu. This process is particularly important since the logs are saved according to this framework: "Site Name", "Log creation date and time". To access this menu from the "Settings" menu, chose the relative item and press [Enter].

```
SET SITE
Name (3:18 carat):
A
F1:Exit
```

Use the [Up] and [Down] character to modify the selected letter. When you want to confirm the letter chosen and move on to the next, find **↵** and press [Enter].

To erase the last written letter find **←** and press [Enter].

Finally, to move between capital and small letters and vice-versa, press the [Su] and [F1] buttons simultaneously.

The length of the site name must be between 3 and 18 characters.

## READINGS MENU

To access this menu, select it from the Main Menu and press [Enter]. You can see two types of readings from within this screen: "Current readings", and "Saved logs". Choose "Current readings" to do the first, and "Saved logs" to do the second. Press the [Up] and [Down] buttons to move around inside the menu, and [Enter] to select the desired item.

```
READINGS
-Current readings
 Saved logs
<-:Select
```

Press [F1] to return to the previous menu.

## CURRENT READINGS MENU

```
METER          1 di 27
-12345678-
 98765432
<-:Select  F1:Exit
```

You can see the selected meters in this menu. To access them, select it from Readings Menu press [Enter]. You can see the selected meter at the upper right of the screen. Press the [Up] and [Down] buttons to change meters. Press [F1] to return to the Main Menu. You can read the current

```
SN: 12345678
Energy(Heat):
2KWh
F1:Exit
```

values of that meter by pressing [Enter]. The screen that comes up will look similar to the image here at the right. Scroll through the readings using the [Up] and [Down] buttons. Press [F1] to return to the "Current Readings" menu.

## SAVED LOGS MENU

To access this menu, from the "Readings" menu, select "Saved Logs" and press [Enter].

```
LOG          12 di 24
 Sitec
 2014-01-21 08-08-24
F1:Exit
```

You can see all the logs saved in the data logger from this menu. The number of the selected log is shown at the upper right of the screen, considering that the lower numbers correspond to less recent saves. The name of the log file is comprised of the site name (which is "Sitec" in the shown example), and from the date and time the scheduling occurred (in the YYYY-MM-DD-hh-mm-ss).

Press [F1] to return to the "Readings" menu. You can scroll through all the saved logs by pressing the [Up] and [Down] buttons. You can select the desired log data and read the meter values in that moment by pressing [Enter]. In particular, you will enter into a screen in which lists all the meters read in the selected log. The selected meter is identified in the upper part of the screen. You can return to the previous menu by pressing [F1]. You can scroll through all the meters on the scheduler list by using the [Up] and [Down] buttons. Finally, select the device and press [Enter] to see its values.

```
METER          1 di 27
-12345678-
 98765432
F1:Exit
```

```
SN: 98765432
Energy(Heat):
4,2KWh
F1:Esci
```

Press the [Up] and [Down] buttons to scroll through various measures. Press [F1] to return to the previous menu.

## LOG READING

There are two ways to read the log files:

- From the Display (see chapter: "Saved Logs Menu" for more information);
- Using the STCU Reader software, supplied by USB drive (for further information, see specific manual);

## MANAGING OF IO M-BUS DEVICES "STCR-IO"

The devices of STCM series are able to manage the STCR-IO devices, that are M-Bus slave with one input and one digital output, configurable as needed. The management of these devices can be done via the "STXM Reader" configuration software, or by sending special SMS to the concentrator.

See manual: "STCR-IO Management User Manual".

## CONFIGURATION USING A PC

Device configuration may be done by connecting it to a PC (by means of a mini USB cable) and using the "STXM Reader" program.

09030.021.00D.020.004 - STCU DS1-LOG User Manual R4\_ENG.docx

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