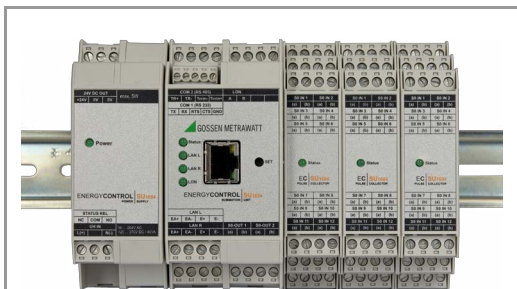


## ENERGYCONTROL SU1604 Summator

3-447-003-15  
2/6.21



Technical data, dimensional drawings, connector pin assignments and order information can be found on the Internet at [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com) under > Products > Industrial Measuring Technology > Energy Management > Summators > SU1604

### Repair and Replacement Parts Service Recalibration

Verification can be conducted at any time by our state-approved test laboratory (EBY-8).

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This address is only valid in Germany. Please contact our representatives or subsidiaries for service in other countries.

### Industrial Product Support

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### 1 Scope of Delivery

- 1 Module (U1604, U1614 or U1624)
- 1 Split toroidal core (only for U1604)
- 1 Bus connector (quantity and type depending on module)
- 1 Short-form operating instructions (this document)

Operating instructions including safety precautions can be found in each respective language at <https://www.gmc-instruments.de/en/products/industrial-measuring-technology/energy-management/summators/su1604/>

### 2 Safety Precautions – Symbols

- Check the specified nominal voltage on the serial plate before placing the instrument into service.
- Observe maximum pulse output voltage.
- When wiring the instrument, make sure that the connector cables are not damaged, and that they are voltage-free.
- If it can be assumed that safe operation is no longer possible, the instrument must be immediately removed from service (disconnect input voltage!). Safe operation can no longer be relied upon if the instrument demonstrates visible damage.
- The device may not be placed back into operation until troubleshooting and repair have been performed, and calibration and dielectric strength have been tested and approved at our factory or an authorized service center.
- Balancing, maintenance or repair may only be carried out by trained personnel who are familiar with the dangers involved.
- The terminals of the U1614 power pack module may only be disconnected or connected in the current and voltage-free state!
- During operation when auxiliary power is active, the U1614 power pack may NOT be plugged into or unplugged from the TBUS!

### 5 COM Settings

#### COM1 (RS-232 full-duplex) default setting:

Baud rate: 115,200 baud (9600, 19,200, 38,400, 57,600, 76,800, 115,200, 230,400, 460,800, 921,600)  
Handshake: RTS/CTS (-, RTS/CTS, XON/XOFF)  
Parity: Off (off, even)  
Mode: ECL (OFF, ECL, DCF ...)

#### COM2 (RS-485 half-duplex) default setting:

Baud rate: 115,200 baud (9600, 19,200, 38,400, 57,600, 76,800, 115,200, 230,400, 460,800, 921,600)  
Handshake: —  
Parity: Off (off, even)  
Mode: ECL (OFF, ECL, DCF ...)

**Note:** Changes to the setting may render the device unusable, insofar as the faulty settings cannot be corrected via another correctly functioning interface.

**Tip:** The COM port for FTDI-based USB-RS485 converters can be permanently assigned in the device manager, and management of two or more virtual COM ports can thus be optimized.

### 6 TCP/IP

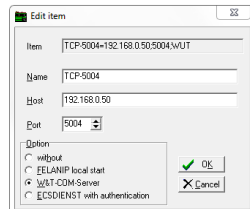
In addition to the COM-1 and COM-2 ports, ECL inputs via TCP/IP are available as well. After opening one of the TCP-IP sockets from a PC, characters can be transmitted in both directions, as if connection had been established via a COM port (like a COM server).

#### Default IP settings and ports:

IP address: 192.168.0.50  
Net mask: 255.255.255.0  
Gateway: 192.168.0.1  
COM-4 port: 5004 (mode = ECL)  
COM-5 port: 5005 (mode = ECL)

#### ECSWIN settings:

If ECSwin software is used, the "W&T-COM-Server" option must be selected. Setup dialog for COM-4 (default settings):



- During operation when auxiliary power is active, NEITHER the U1604 basic module NOR any other S0 modules may be plugged into or unplugged from the TBUS.
- Opening the housing of the U1614 power pack during operation is impermissible! The fuse may only be replaced in the voltage-free state.
- The TBUS may only be used to connect ECS components. Any combination with non-system devices with similar backplane connection is NOT permissible.

#### Meanings of Symbols on the Instrument

Warning concerning a point of danger (attention, observe documentation!)

This device may not be disposed of with the trash. Further information can be accessed on the Internet at [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com) by entering the search term "WEEE".

CE Conformity Marking

### 3 Introduction

The new modular concept of the SU1604 summator permits space-saving setup of an energy control system in accordance with actual requirements. Thanks to strict software compatibility with U1600 and U1601/2/3 systems which are already in use, these can be easily replaced or expanded.

A summator can be set up using the following modules:

- U1604 basic module with the following interfaces:
  - 1 ea. RS-232 (COM-1), 1 ea. RS-485 (COM-2), ECS-LAN left + right, LON, 2 ea. S0 relay output
- U1614 power pack module with status relay for supplying power to all components via the TBUS and an additional 24 V DC output (max. 5 W) – overall output power amounts to 20 W

### 7 TCP/IP Settings in the ECSwin Control Panel

All adjustable IP parameters are set via ECSwin software. All IP parameters and the statuses of COM-4 and COM-5 can be checked here in the status view.

U1604	22:59:10	U1604	22:56:54
RELAYS-MODE		TCP/IP-STATUS	
IP-ADRESSE	192.168.0.50	IP-Adresse:	192.168.0.50
IP-NETMASK	255.255.255.0	Subnet-Mask:	255.255.255.0
IP-GATEWAY	192.168.0.1	Gateway:	192.168.0.1
TESTS..		MAC:00-1E-C0-A3-3F-B2	
		COM-4 Port: 5004 [ ]	
		COM-5 Port: 5005 [ ]	

### 8 Relays and S0 Relays (S0-OUT)

The U1604 basic module makes two S0 semiconductor relays (relay/S0-OUT 1+2) available:

U1604	Read/Write Status	Read/Write Relay Mode
Relay 1 / S0-OUT 1	REL 1 or SOREL 1	RELM 1
Relay 2 / S0-OUT 2	REL 2 or SOREL 2	RELM 2
Relay 3 (prepared)	REL 3	RELM 3
Relay 4 (prepared)	REL 4	RELM 4
Relay 5 (prepared)	REL 5	RELM 5
Relay 6 (prepared)	REL 6	RELM 6

Comparison with U1601/3 Summator (relays 1+2, S0 semiconductor relays 3 ... 6):

U1601/3	Read/Write Status	Read/Write Relay Mode
Relay 1	REL 1	RELM 1
Relay 2	REL 2	RELM 2
S0-OUT 1	REL 3 or SOREL 1	RELM 3
S0-OUT 2	REL 4 or SOREL 2	RELM 4
S0-OUT 3	REL 5 or SOREL 3	RELM 5
S0-OUT 4	REL 6 or SOREL 4	RELM 6

- U1624 S0IN12 input module with 12 S0 compatible inputs (max. 6 modules, max. 64 S0 inputs)

### 4 Connector Terminals, TBUS and Power Supply

#### Connector Terminals

All signals are fed to the respective module via screw terminals which can be unplugged (3, 4 or 5-pole). This assures trouble-free replacement in the event that servicing is required.

#### TBUS

The individual components are connected to each other via the so-called TBUS.

The TBUS is laid out as a 5-conductor system and distributes 24 V DC supply power and signals from the TBUS communications interface (RS-485) to all components. The fifth conductor is used to indicate status. One or two corresponding TBUS plug connectors are included with each module. These TBUS parts (width: 17.5 or 22.5 mm) are snapped into the DIN h-rail in the fully assembled state before the module is plugged on.

**Attention!** When power is supplied as auxiliary energy, NEITHER the U1614 power pack module NOR any other S0 modules may be plugged into or unplugged from the TBUS!

Please note: The U1614 power pack module with an overall width of 35 mm requires two 17.5 mm TBUS plug connectors, and all other devices require one or two of the 22.5 mm TBUS plug connectors.

#### Power Supply

There are two power supply options:  
– via the U1614 power pack module

**Attention!** When power is supplied as auxiliary energy via TBUS the power pack module U1614 may not be plugged in!  
– Via the external 24 V auxiliary power terminal (see photo below)

If the 24 V auxiliary power terminal is used, no status relay is available.

In order to make a status output available for this configuration, the status of the U1604 basic module can be mapped to relay 1 or 2.

The status is mapped via a so-called attribute.

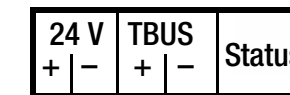
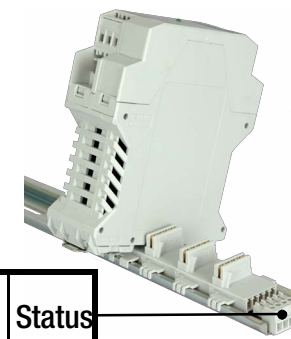
Attributes are stored to non-volatile memory at the U1604 basic module and are NOT deleted in the event of a simple or an extended master reset.

Activating status mapping to relay 1 or 2:

STATRELMAP attribute = 1 (relay 1 or 2)

Deactivating status mapping (default):

STATRELMAP attribute = 0



Connector pin assignments:

TBUS connector terminal PC 1719697 (Phoenix-Contact)

### 10 Technical Data

#### Binary Inputs

U1624 - S0 Inputs, 12-Fold S0IN12	
Input quantity	Direct current, bipolar (square-wave pulses, S0 compatible)
Design	Electrically isolated
Input voltage	Max. 30 V
Input resistance	5.1 kΩ

#### Auxiliary Power Supply

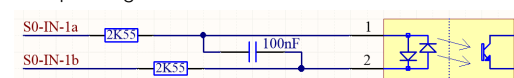
U1614 - Power Pack with Broad Range AC - DC Input	
Nominal range of use, AC	90 V ... 264 V
Frequency	47 ... 440 Hz
Nominal range of use, DC	120 V ... 370 V
Efficiency	83 %
DC output voltage accuracy	Max. 24 V, 5 W ±2%
Total DC output power	Max. 24 V, 20 W (incl. DC output)
Power consumption U1604 (basic module) U1624 (12 ea. S0 input)	Max. 40 VA 5 W 1 W
Fuse	T1.6A/250V (20 mm)
Status relay	250 V AC, 5 A, 3-pole, AgNi 90/10

#### Memory

Flash - MRAM - RTC	
Flash memory	128 MB
MRAM Data preservation	4 MB > 20 years (data preservation depends on the RTC backup battery)
RTC real-time clock Follow-up time Accuracy Backup battery for RTC Service life	> 10 years 5 ± 5 ppm (0 ... +10 ppm) Lithium batt. 3 V/850 mA ½ AA > 10 years, battery replacement is typically unnecessary

The following applies in general:  $Energy\_channel\_number = S0IN12\_input\_number + (TBUS\_address \cdot 12)$

S0 input diagram:



### Comparison of the Summators

The following table provides an overview of the hardware features included with the various ECS summators.

Hardware Feature	U1604	U1601/2/3	U1600
Modular concept with TBUS	✓	—	—
COM-1 (RS-232)	Max. 921 k bd	Max. 115 k bd	Max. 38.4 k bd
COM-2 (RS-232)	—	✓ <sup>1</sup> / ✓ <sup>2</sup> / ✓ <sup>3</sup> Max. 115 k bd	✓ <sup>2</sup> Max. 9600 bd
COM-2 (RS-485)	Max. 921 k bd	—	—
ECS-LAN (L+R)	Max. 375 k bd	Max. 375 k bd	Max. 125 k bd
LON	✓	✓	—
TCP/IP (10/100 Mbit/s) COM-4 COM-5	Port 5004 Port 5005	—	—
S0 compatible counter inputs with U1624 module (12 S0 ea.)	0 max. 64	0 <sup>3</sup> —	24 —
Analog inputs (20 mA, 10 V, S0) with ANAIN6 module (6 ANA ea.)	0 —	12 / 0 / 6 —	—
Analog outputs	—	2 / 0 / 2 —	—
Status relay (250 V AC, 3-pole)	to U1614	✓	✓
Relay (250 V AC, 3-pole)	—	2 / 0 / 2	4
S0 relay (semiconductor relay)	2	4 / 0 / 4	—
RAM Type	4 MB MRAM <sup>4</sup>	1 MB SRAM	128 kB / 512 kB <sup>5</sup> SRAM
Flash memory Type	128 MB Flash	2 MB Flash	512 kB EPROM
RTC real-time clock (with backup battery) Accuracy <sup>6</sup>	5 ± 5 ppm (0 ... +10 ppm)	±20 ppm	±10 ppm

<sup>1</sup> COM-2 only available for U1601 with split cable  
<sup>2</sup> COM-2 for U1600 with split cable only and only usable for DCF radio controlled clock module or for character output (printer)  
<sup>3</sup> Analog inputs can be used as S0 inputs (U1601 + U1603)  
<sup>4</sup> As opposed to SRAM, MRAM does not require a backup battery for data preservation  
<sup>5</sup> U1600 without/with memory expansion  
<sup>6</sup> Accuracy of ±10 ppm → RTC gains (+) or loses (-) no more than roughly 0.8 s per day

### Outputs

Relay Outputs	
2 S0 semiconductor relays (U1604 basic module)	Max. 50 V DC, 200 mA, bipolar
Status relay (U1614 power pack module)	250 V AC, 5 A, 3-pole, AgNi 90/10

### Mechanical Design

Modular Housing Concept	
Width U1614 power pack module U1604 basic module U1624 S0IN12	35 mm 45 mm 22.5 mm
Height	100 mm
Depth U1614 power pack module U1604 basic module U1624 S0IN12	114 mm 114 mm 107 mm
Mounting	To top-hat rail per EN 50022 / 35mm

### 11 Return and Environmentally Sound Disposal

The instrument is a category 9 product (monitoring and control instrument) in accordance with ElektroG (German electrical and electronic device law). This device is subject to the WEEE directive. We also make reference to the fact that in this regard, the current status can be accessed on the Internet at [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com) by entering the search term WEEE.

We identify our electrical and electronic devices in accordance with WEEE 2012/19/EU and ElektroG using the symbol shown at the right per DIN EN 50419.

These devices may not be disposed of with the trash. Please contact our service department regarding the return of old devices.

