



GE552Y050 M-BUS ADAPTER/REPEATER

User Guide

Rev 3.7

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1. M-BUS OVERVIEW

1.1 DESCRIPTION of the M-Bus System

The M-Bus (Meter Bus) system is a communication protocol compliant with the EN13757-2 standard. The M-Bus System provides the following advantages:

- High level of data transmission security
- Low wiring costs
- Long distances without requiring repeaters
- Large number of central units
- Detection of both battery-powered and mains-powered devices
- Automatic device recognition
- Vast array of systems and components available
- Different types of bus topology: linear, star, and tree

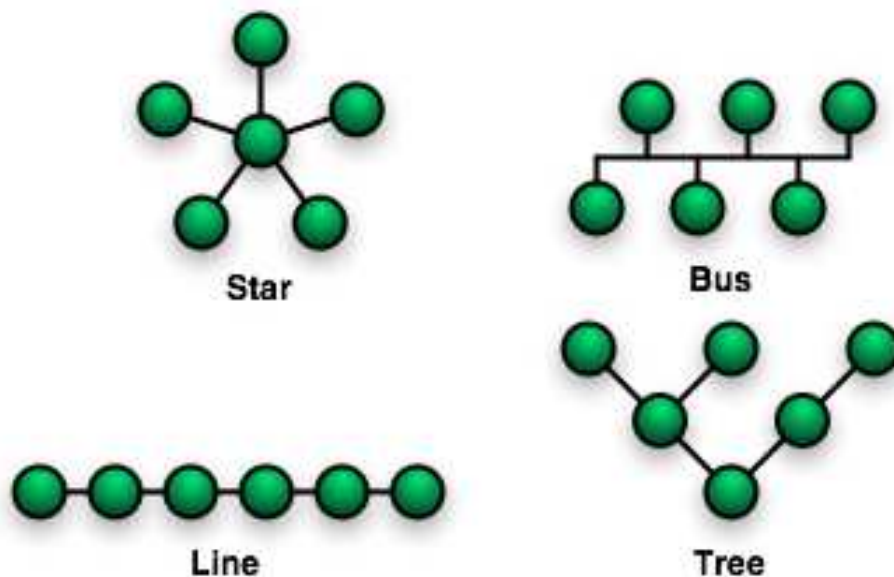


Figure 1 - Bus topologies

1.2 Addressing

The M-bus uses two types of addressing mode to detect the devices

- Primary addressing: up to 250 primary addresses can be allocated within an M-bus system. The primary address is normally allocated while setting up the central units.
- Secondary address: the secondary address consists of 8 bytes and allows the allocation of any number. By default, the secondary address of the devices is the same as the manufacturer serial number. This type of allocation prevents bus conflicts.

1.3 Sizing the M-Bus System

Cable type

- Telephone cable shielded 0.5mm² (4 x 0.8mm)
- NYM cable (1.5mmq)
- Cable maximum capacitive load: 152 nF/km

If you are using a cable of 0.6mm section halve the maximum length and the number of slaves

Follow the instructions provided in the table to size the M-Bus system

Type of plant	Maximum distance	Overall cable length	Cross-section mm ²	Number of devices (slaves)	Max. transmission rate
Small residential buildings	350 m	1000 m	0.8 mm	250	9600 Baud
Large residential buildings	350 m	4000 m	0.8 mm	250	2400 Baud
				64	9600 Baud
Small complex	1000 m	4000 m	0.8 mm	64	2400 Baud
Large complex	3000 m	5000 m	1.5 mm ²	64	2400 Baud
Medium neighbourhood	5000 m	7000 m	1.5 mm ²	16	300 Baud
Point-to-point connection	10000 m	10000 m	1.5 mm ²	1	300 Baud

BUS signal specifications

M-Bus system	u.m.	Condition	Minimum	Typical	Maximum	Measure ment unit
Number of devices per segment	n	GE552Y050	0		60	
Transmission rate	T	$C_{segment} \leq 382nF$	300	2400	9600 Baud	Bd
Bus voltage	U	IM=0...400mA	12		42	V
Bus Voltage (Master)	U _M	IM=0...400mA	24	40	42	V
Bus Voltage (slave)	U _{S,R}	$I_S \leq 1.5mA$	±21		±42	V
Bus current	I _{M,V}	GE552Y050	0		90	mA
DC Bus current	I _{M,K}	GE552Y050	130	500	160	mA
Current (slave)	I _{S,R}	US=21...42V	0.75	1.2	1.2	mA
Transmitted current (slave)	I _{S,S}	US=21...42B	11		20	mA

2. GE552Y050 INSTALLATION

2.1 *GE552Y050 Description*

GE552Y050 is a unit that reads M-Bus devices in compliance with the EN 13757-2 standard.

You can connect up to 60 M-Bus devices to each GE552Y050 unit.

The GE552Y050 unit can be used in three different ways:

- Master Mode connected to GE552Y051
- Master Mode connected to the PC using the GE552Y056
- Slave/Repeater Mode, inserted into an already existing M-Bus network in order to expand it or repeat the signal



2.2 GE552Y050 Appearance

GE552Y050 looks like a device for mounting on DIN rail, below connectors / leds are listed:

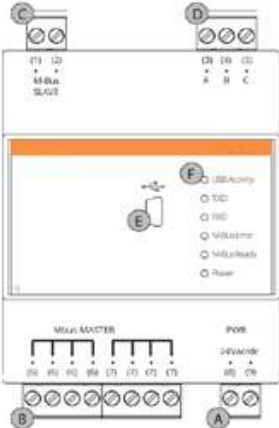
	A	POWER SUPPLY CONNECTOR
		(9) – negative pin (-) power supply (24Vac/dc) (8) – positive pin (+) power supply (24Vac/dc)
	B	M-BUS Master CONNECTOR
		(6) – Pin 1 for connection M-Bus meters (Master mode) (7) – Pin 2 for connection M-Bus meters (Master mode)
	C	M-Bus Slave CONNECTOR
		(1) – Pin 1 for M-Bus net to extend (Repeater mode) (2) – Pin 2 for M-Bus net to extend (Repeater mode)
	D	CONNECTOR FOR DATALOGGER CONNECTION
		(3) – Pin A for datalogger connection (GE552Y051) (4) – Pin B for datalogger connection (GE552Y051) (5) – Pin C for datalogger connection (GE552Y051)
	E	CONNECTOR FOR PC CONNECTION
		MINI-USB-B
	F	LEDs STATUS
		Ref. Chap 2.6

Figure 2 – Features and connectors Level Converter (GE552Y050)

2.3 Technical characteristics

ELECTRICAL CHARACTERISTICS

Rated Voltage	24Vdc +/- 10% (Rev. HW 1.0 or if not specified) 24Vdc +/- 10%, 24Vac (min 20Vac, max 40Vac) for HW 2.0 versions
Installation category	Classe III
Rated Voltage	3W + (0.07W * numero di M-Bus slave)
Maximum consumption	12W

MECHANICAL CHARACTERISTICS

Operating temperature range	From -20°C to +55°C
Storage temperature range	From -25°C to +65°C
Dimensions	90x71x62 mm (HxLxD) – DIN
Installation type	35mm DIN bar (EN60715)
Protection rating	IP20 (EN60529)
Connections	M-Bus Slave: to connect as a repeater / extender M-Bus Master: for the connection to the M-Bus meters Mini-USB Type B: for connection to the software GE552Y056

M-BUS SECTION

Reference standard	EN13757-2 (Physical Layer)
Baudrate	Min. 300bps – Max. 9600bps
M-Bus-RS232 isolation	1KV AC
M-Bus-USB isolation	1KV AC
Max. number of M-Bus devices	60
Max. number of Repeaters	Unlimited in stand-alone mode for reading current data via USB N°4 as slave GE552Y051 M-Bus
Transmission speed	Minimum: 300bps Typical: 2400bps Maximum: 9600bps
Bus voltage	Min. 12V Max. 42V
Short circuit protection	Yes

2.4 Topology and connection to M-Bus network

The M-Bus technology allows good freedom of choice on the network topology, it is possible to connect the devices present in the system according to a star, linear, tree topology as seen in 4 and 5, instead of the ring topology (**Errore. L'origine riferimento non è stata trovata.**) is not allowed, it is also not necessary to observe any polarity of the bus, simplifying de facto, the installation.

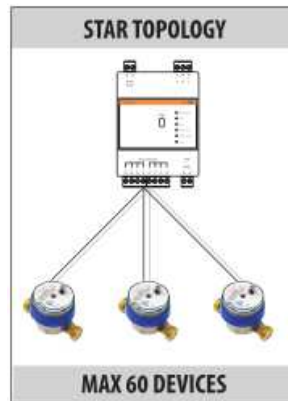


Figure 3 – Start Topology

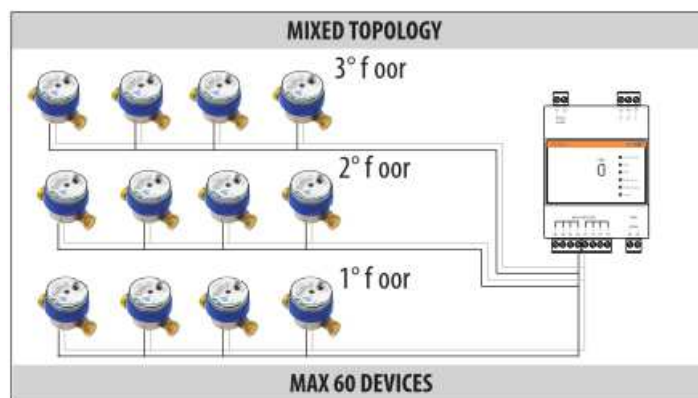


Figure 4 – Mixed Topology

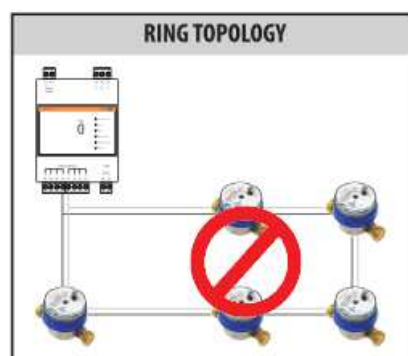


Figure 5 – Loop topology NOT ALLOWED

2.5 GE552Y050 mode of operation

GE552Y050 can be used as an M-Bus communication interface for GE552Y051 datalogger or a PC with a software GE552Y056 or as a repeater/extender of an M-Bus network. The table below shows the connection diagrams for the different modes of operation.

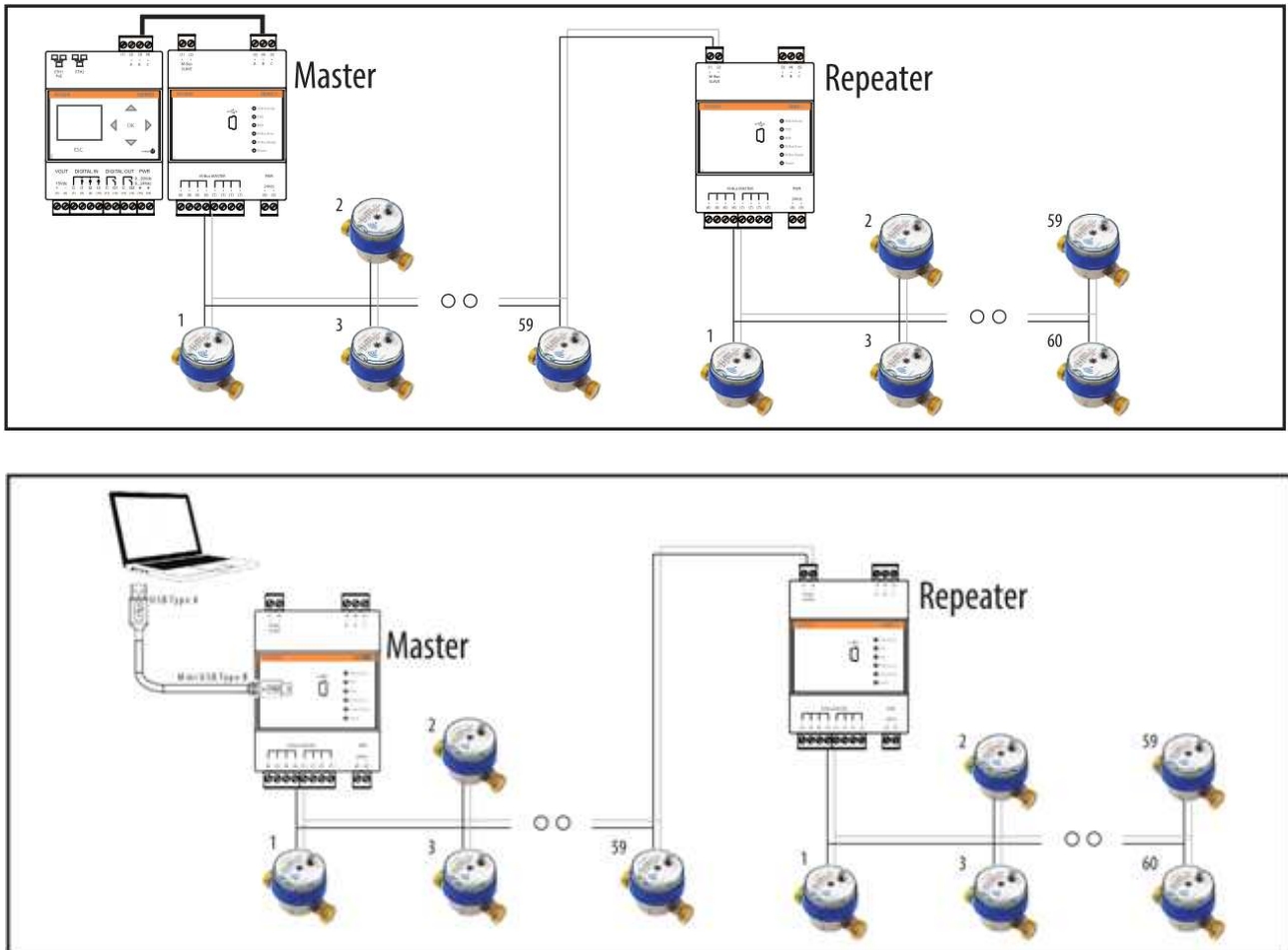


Figure 6 – Allowed connection

2.6 LEDs status

On GE552Y050 device are present n ° 6 LED that indicate the operating status as shown in the figure:



Figure 7 - Status indicators

- USB Activity:
 - o 2 blinks → the device is ready to be connected to the PC by means of the mini USB-B cable
 - o 5 blinks → PC successfully connected and device correctly recognised by the PC
- TXD: Indicates the status of the data transmission to the M-Bus network connected to terminals (6) and (7)
 - o ON → data transmission in progress
 - o OFF → no data transmission in progress
- RXD: Indicates the status of the data received by the M-Bus network connected to terminals (6) and (7)
 - o ON → data reception in progress
 - o OFF → no data reception in progress
- M-Bus error: Indicates whether the BUS current is correct or not
 - o ON → BUS overload error (possible short circuit on the M-Bus or excessive number of connected devices)
 - o OFF → no errors detected
- M-Bus ready: Indicates that the BUS voltage is correct and that there are no anomalies.
 - o ON → The BUS is polarised with enough voltage to allow for proper operation
 - o OFF → the BUS voltage is not sufficient to allow for proper operation
- Power: green. Indicates whether the device is powered on
 - o ON → The device is powered on correctly
 - o OFF → The device is not powered on correctly

2.7 *Device power supply*

The sizing of the power supply should be done considering that the MBUS devices may draw up to 20mA during communication and that in the process of plant commissioning may verify address conflict, this means that at a GE552Y050 request can respond more slave devices simultaneously, and then, at that moment, the absorbed current by each slave is added. GE552Y050 limits to 300mA the maximum current on the MBUS line. We therefore recommend a 24Vdc power supply (for HW 2.0 versions 24Vac/dc) with minimum power of 12W and a tolerance of voltage value as specified in Chap 2.3.

2.8 *Firmware update*

Through the GE552Y056 it is possible to check the version of firmware in GE552Y050 and if it is necessary to update it. Refer to the GE552Y056 user guide for details.



IT - AVVERTENZE PER IL CORRETTO SMALTIMENTO DEL PRODOTTO

Questo prodotto rientra nel campo di applicazione della Direttiva 2012/19/UE riguardante la gestione dei rifiuti di apparecchiature elettriche ed elettroniche (RAEE). L'apparecchio non deve essere eliminato con gli scarti domestici in quanto composto da diversi materiali che possono essere riciclati presso le strutture adeguate. Informarsi attraverso l'autorità comunale per quanto riguarda l'ubicazione delle piattaforme ecologiche atte a ricevere il prodotto per lo smaltimento ed il suo successivo corretto riciclaggio.

Si ricorda, inoltre, che a fronte di acquisto di apparecchio equivalente, il distributore è tenuto al ritiro gratuito del prodotto da smaltire. Il prodotto non è potenzialmente pericoloso per la salute umana e l'ambiente, ma se abbandonato nell'ambiente impatta negativamente sull'ecosistema. Leggere attentamente le istruzioni prima di utilizzare l'apparecchio per la prima volta.

Si raccomanda di non usare assolutamente il prodotto per un uso diverso da quello a cui è stato destinato, essendoci pericolo di shock elettrico se usato impropriamente.

Il simbolo del bidone barrato, presente sull'etichetta posta sull'apparecchio, indica la rispondenza di tale prodotto alla normativa relativa ai rifiuti di apparecchiature elettriche ed elettroniche.

L'abbandono nell'ambiente dell'apparecchiatura o lo smaltimento abusivo della stessa sono puniti dalla legge.

EN - IMPORTANT INFORMATION FOR CORRECT DISPOSAL OF THE PRODUCT

This product falls into the scope of the Directive 2012/19/EU concerning the management of Waste Electrical and Electronic Equipment (WEEE). This product shall not be disposed in to the domestic waste as it is made of different materials that have to be recycled at the appropriate facilities. Inquire through the municipal authority regarding the location of the ecological platforms to receive the product for disposal and its subsequent correct recycling. Furthermore, upon purchase of an equivalent appliance, the distributor is obliged to collect the product for disposal free of charge. The product is not potentially dangerous for human health and the environment, but if abandoned in the environment can have negative impact on the environment. Read carefully the instructions before using the product for the first time.

It is recommended that you do not use the product for any purpose rather than those for which it was intended, there being a danger of electric shock if used improperly.

The crossed-out wheeled dustbin symbol, on the label on the product, indicates the compliance of this product with the regulations regarding Waste Electrical and Electronic Equipment.

Abandonment in the environment or illegal disposal of the product is punishable by law.

FR - AVERTISSEMENTS POUR L'ÉLIMINATION CORRECTE DU PRODUIT

Ce produit entre dans le champ d'application de la directive 2012/19 / UE relative à la gestion des déchets équipements électriques et électroniques (DEEE). L'appareil ne doit pas être jeté avec les ordures ménagères car il est fait de différents matériaux pouvant être recyclés dans des centres appropriés. Renseignez-vous auprès de l'autorité locale concernant l'emplacement des plates-formes écologiques appropriées pour recevoir le produit pour sa destruction et son recyclage correct ultérieur. Il convient également de rappeler que, en cas d'achat d'un appareil équivalent, le distributeur est tenu de collecter le produit à détruire. Le produit n'est potentiellement pas dangereux pour la santé humaine et l'environnement, mais s'il est abandonné dans l'environnement, il a un impact négatif sur l'écosystème.

Lisez attentivement les instructions avant d'utiliser l'appareil pour la première fois. Il est interdit d'utiliser le produit pour un usage différent de celui auquel il était destiné, il y a risque de choc électrique si utilisé incorrectement.

Le symbole de la poubelle barrée sur l'étiquette de l'appareil indique sa correspondance produit à la législation relative aux déchets d'équipements électriques et électroniques.

L'abandon dans l'environnement de l'équipement ou l'élimination illégale de l'équipement est punissable par la loi.

DE - WICHTIGE HINWEISE ZUR KORREKTEN ENTSORGUNG DES PRODUKTS

Dieses Produkt fällt in den Anwendungsbereich der Richtlinie 2012/19/EU über die Entsorgung von Elektro- und Elektronik - Altgeräten (WEEE). Dieses Produkt darf nicht in den Hausmüll entsorgt werden, da es aus verschiedenen Materialien besteht, die in entsprechenden Einrichtungen recycelt werden müssen. Erkundigen Sie sich bei ihrer Gemeinde nach dem Standort des nächsten Recyclinghofs bzw. der nächsten Annahmestelle, um das Produkt dem Recycling zuzuführen bzw. fachgerecht zu entsorgen.

Darüber hinaus ist der Händler verpflichtet, das Produkt beim Kauf eines gleichwertigen Geräts kostenlos zu entsorgen.

Das Produkt ist für die menschliche Gesundheit und die Umwelt potenziell nicht gefährlich. Diese können sich aber, falls sie in der Umwelt gelangen, negativ auf diese auswirken. Lesen Sie daher vor dem ersten Gebrauch des Produkts die Inbetriebnahme-, Bedienungs- und Entsorgungsanweisungen sorgfältig durch. Es wird empfohlen, dass Sie das Produkt nur für den vorgesehenen Zweck verwenden.

Bei unsachgemäßer Verwendung bzw. Fehlgebrauch besteht die Gefahr eines elektrischen Schlags.

Das Symbol der durchgestrichenen Mülltonne auf dem Etikett des Produkts weist auf die Konformität dieses Produkts zu den

Vorschriften für Elektro- und Elektronik-Altgeräte hin. Das Ablagern in der Umwelt oder die illegale Entsorgung des Produkts ist strafbar.

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