davicom

Site Monitoring Systems by Comlab

MEXM

Monitoring EXpansion Modules

Version 2.1

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Reference Manual

MAN1025

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Limited warranty

Comlab Telecommunications Inc. (Comlab) warrants all its products to be free from any defect in manufacture for a period of two years after delivery to the original purchaser. All warranty returns must be authorized by a Comlab representative.

The limitation of liability under this warranty shall be to repair or replace any part of the product, which proves to be defective after inspection by Comlab. This warranty shall not apply to any Comlab product that has been disassembled, modified, physically or electrically damaged, inappropriately installed, or any product that has been subjected to the conditions exceeding the applicable specifications or ratings.

Comlab assumes no liability for any direct, indirect or consequential injury, loss, economic loss, damage, fines or penalties incurred through the use, or inability to use Comlab products.

Comlab products are not intended for use in medical, life-saving, life-sustaining or critical applications. Comlab customers using or selling Comlab products for use in such applications do so at their own risk and agree to fully indemnify Comlab for any damages resulting from such improper use or sale.

Comlab reserves the right to make design changes to its products without incurring any obligation to make the same changes to previously purchased units.

This warranty is the full extent of obligation and liability assumed by Comlab with respect to its products. Comlab neither makes nor authorizes any person or company to make any other guarantee or warranty concerning its products.

Safety information

The Davicom MEXM should be installed by qualified technical personnel only. Installation of this device by an unqualified person could result in hazardous conditions to the installer or other personnel, and/or damage to the MEXM or to other equipment. Ensure that proper safety precautions have been taken before installing this MEXM and any associated equipment.

The MEXM is designed to meet standard safety requirements, and it is extremely important that it not be modified in any way. Modification of this equipment will void the warranty and could pose a hazard to the user of this equipment or to maintenance personnel. Service of the MEXM should be performed by qualified technical personnel who are familiar with the unit. Note that the Davicom MEXM is designed for indoor use in a dry location, Installation and operation in other locations could be hazardous.

Depending on your installation, the MEXM may contain HIGH VOLTAGES. Exercise caution when working in and around the unit if it is connected to your site wiring.

Regulatory Compliance

FCC (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by Comlab may void the user's authority, as granted by the FCC, to operate this device and should not be made.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Table of contents

1. About the MEXM Davicom Expansion Module

1.1. Introduction

The Davicom MEXM unit has been designed to be used with the Davicom series of Remote Monitoring and Alarm Control systems. The MEXM is an easy and cost effective solution to increase the Davicom units monitoring capabilities by offering additional analog, digital and relay I/Os.

The MEXM uses the Modbus communications protocol and can be used with third party Modbus equipment. However, when used with a Davicom unit, communication is completely transparent and does not require any technical knowledge of the Modbus protocol.

Figure 1 describes the two MEXM models that are currently available (the MEXM-1 and MEXM-2). **Table 1** shows how many analog (metering) , digital (status) and relay I/Os are available on each model.

	Number of I / Os		
	ANALOG	**DIGITAL**	**RELAYS**
MEXM-1	24	24	24
MEXM-2	0	64	0

Table 1 : MEXM-1 / MEXM-2 I/O distribution

The MEXM-1 adds 24 analog, 24 digital and 24 relay outputs to any Davicom unit while the MEXM-2 adds 64 digital inputs. The additional I/Os can be accessed and programmed through DavLink's software as easily as the Davicom's standard I/Os. The MEXM's I/Os scan rate depends on the number of units connected and the communication mode selected. The maximum achievable scan rate is close to 10 Hz.

1.2. Front & rear panel description

1.2.1. Front panel

The MEXM front panel is free of any parts. This allows the installation of MEXM units in racks (front or rear mounting) or on any flat surface, thus allowing direct access to I/O connectors, controls and configuration switches.

1.2.2. Rear panel

The rear panel is divided into sections identified by colors. Blue is assigned to Status inputs, Orange to relays and Gray to Metering inputs.

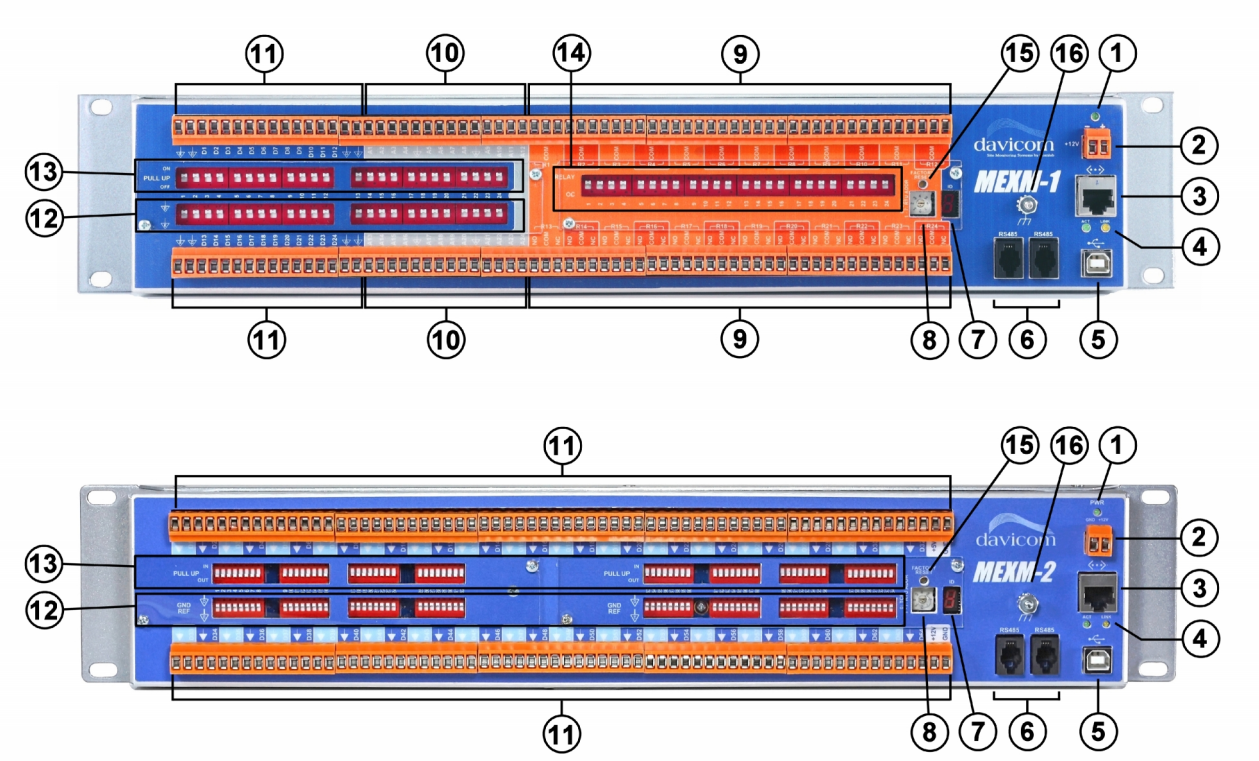

Figure 1 : Connectors on the MEXM-1 and MEXM-2 rear panel

1. 12 VDC power led indicator
2. 12 VDC input power screw terminals
3. RJ-45 Ethernet jack for TCP communications mode
4. Ethernet Activity/Link leds
5. USB port for RTU communication mode
6. RJ9 connectors for daisy-chain in RTU communications mode
7. Slave ID 7-segment led indicator
8. TCP/RTU communications mode selector
9. Relays screw terminals
10. Metering inputs screw terminals
11. Status inputs screw terminals
12. Status inputs ground selection DIP switches
13. Status inputs pull-up selection DIP switches
14. Relays/Open collector selection DIP switches
15. Factory reset switch
16. Ground screw terminal

2. Connecting MEXM units to a Davicom unit

2.1. MEXM communications modes

The MEXM uses the Modbus protocol. Modbus is a serial communications protocol published by Modicon in 1979 for use with its programmable logic controllers (PLCs). It has become a de facto standard protocol for industrial communications, and is now the most commonly available means of connecting industrial electronic devices.

The MEXM may be configured to communicate in one of these two Modbus protocol versions: RTU (Remote Terminal Unit) or TCP (Transmission Control Protocol).

Modbus RTU is used with serial communications (RS422/RS485) whereas Modbus TCP is used for communications over TCP/IP networks.

In TCP mode, a single MEXM may be connected to a Davicom unit with a crossover Ethernet cable. Up to 8 [1] MEXMs can also be connected to an existing network infrastructure through an Ethernet switch (not provided).

In RTU mode, up to 7 MEXMs can be “daisy chained” to a Davicom unit. When using the RTU mode, no additional equipment other than the Davicom unit and the MEXMs are required.

2.2. Setting up a MEXM in RTU mode

To configure a MEXM in RTU mode, set the TCP/RTU communications-mode selector switch to any position between 1 and 7. When more than one MEXM are used in RTU mode, **each unit TCP/RTU communications-mode selector switch must be set to a different value**.

Default MEXM RTU parameters are shown in **Table 2**.

Baud Rate	115200
Parity	N

Table 2 : Default MEXM RTU parameters

[1] The Davicom units do not support connection to more than 8 MEXMs.

2.3. Connecting MEXM units in RTU mode

To connect a MEXM to a Davicom unit in RTU mode, use the USB cable provided with the MEXM and connect it between the MEXM USB connector (Device) and the USB connector located on the rear panel of the Davicom unit (Host).

To add more MEXM devices in RTU mode, connect them in “daisy-chain” with the provided RJ9 cables as shown in **Figure 2**, the first MEXM being connected to a Davicom unit with the USB cable. **Each MEXM must be set to a different RTU Address** (see Section 2.2).

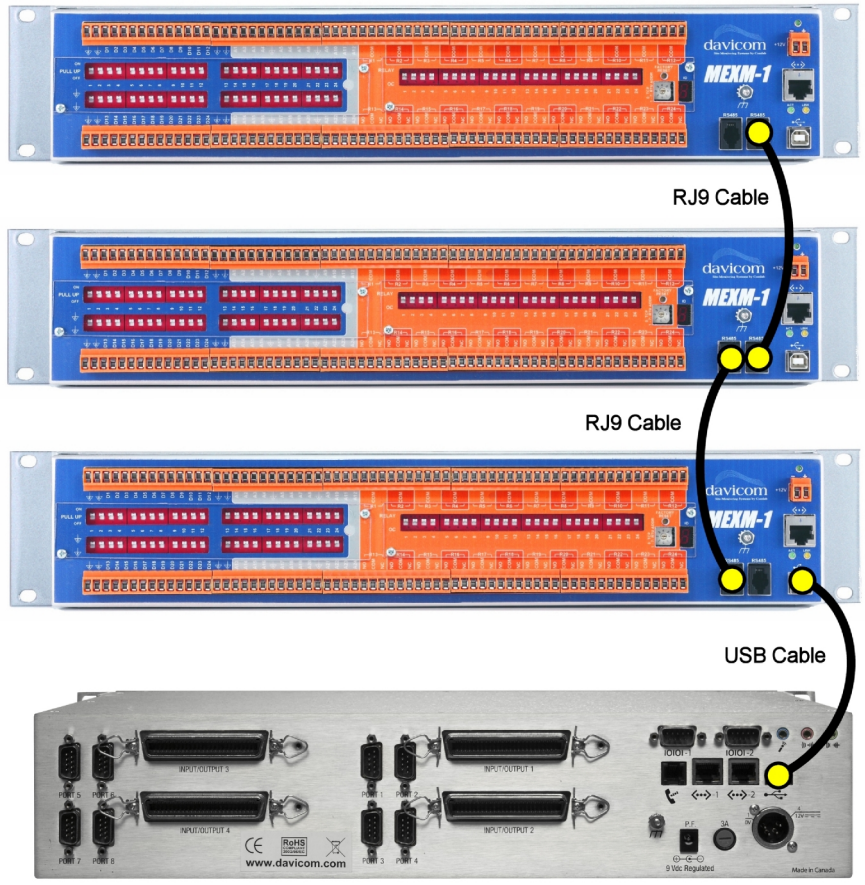

Figure 2 : Three RTU-mode MEXM units connected to a Davicom unit

2.4. Setting up a MEXM in TCP mode

Set the TCP/RTU communications-mode selector switch to position 0 (item 8 in **Figure 1**) to configure a MEXM for TCP. The default parameters for the MEXM are shown in **Table 3**.

IP Address	192.168.5.240
Subnet Mask	255.255.255.0
Default gateway	0.0.0.0
IP port	502

Table 3 : Default MEXM IP parameters

2.5. Connecting MEXM units in TCP mode

The DV-208, DV-216 and DV-Mini units support the Modbus protocol only on the RJ45 Ethernet Jack 2. This connector should always be used to connect a MEXM to the Davicom unit. The DV-Micro Ethernet jack fully supports the Modbus protocol.

2.5.1. Connecting one MEXM in TCP mode

To connect a single MEXM to a DV-208/DV-216 or a DV-Mini, use the crossover Ethernet cable provided with the MEXM. Connect the cable between the Davicom unit RJ45 Ethernet Jack 2 and the MEXM RJ45 Ethernet jack as shown in **Figure 3** and **Figure 4**.

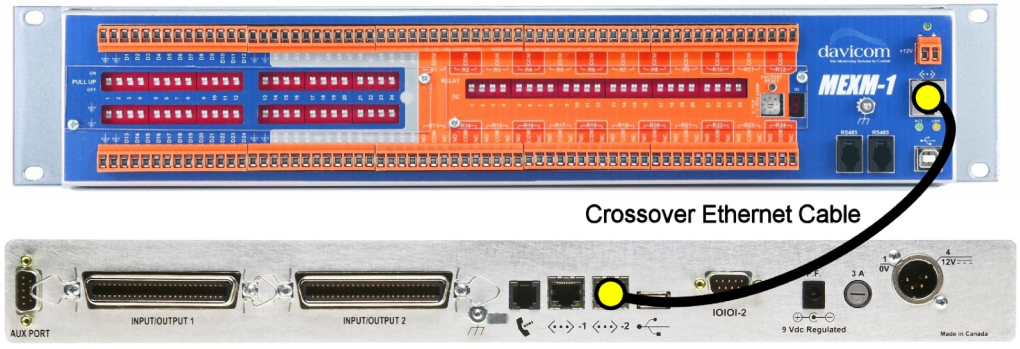

Figure 3 : MEXM to DV-Mini TCP mode connection (crossover)

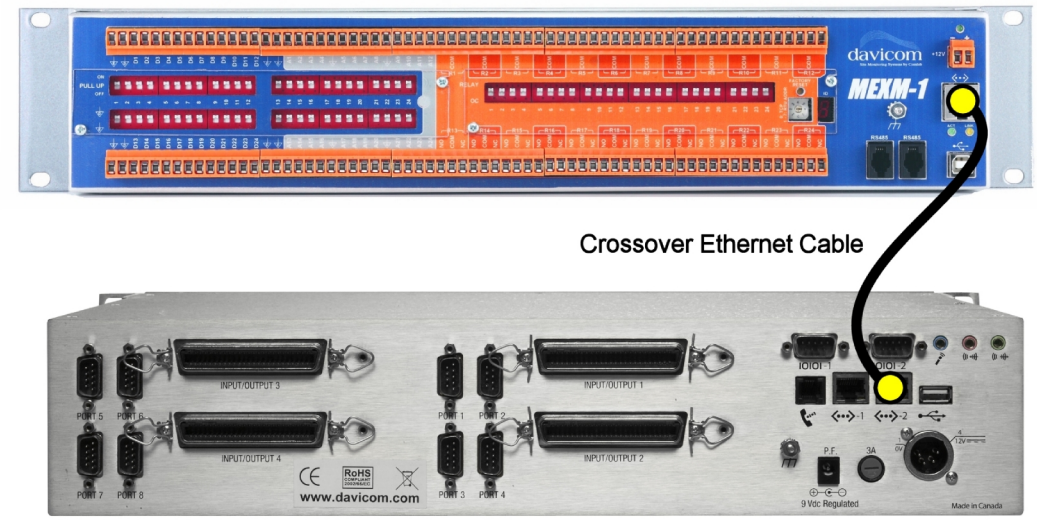

Figure 4 : MEXM to DV-208/216 TCP mode connection (crossover)

2.5.2. Connecting more than one MEXM in TCP mode

Connecting a MEXM to a Davicom unit via an Ethernet switch or an existing network infrastructure requires the use of a straight Ethernet cable (not included with the MEXM).

It is preferable to use a separate switch for connection between the MEXM units and the Ethernet 2 jack on the Davicom (see **Figure 5**). This will reduce the possibility of loosing communications between the Davicom and the MEXM. Although a single network router/switch configuration at the site will work correctly, the increased IP traffic may slow down communications between the Davicom and the MEXM modules, thus resulting in COMM LOSS alarms. Reducing the sensitivity from High to Medium or Low may help under these conditions (see **Figure 16** in section **4.4** for more details).

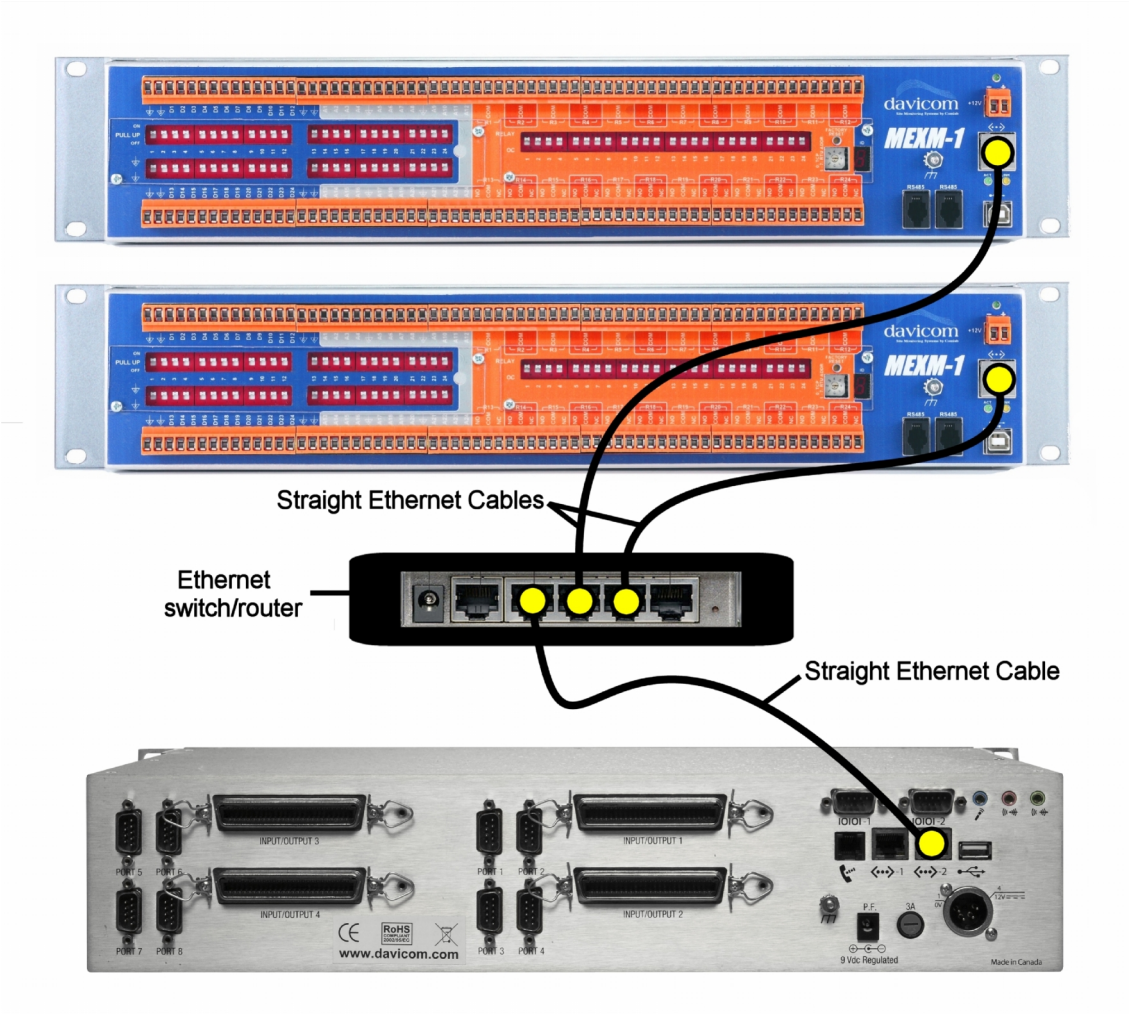

Figure 5 : Connecting more than one MEXM in TCP mode

2.6. Restoring the factory default parameters

To completely restore factory default parameters, press and hold the Factory Reset Button (item 15 in **Figure 1**) until the 7-segment LED display blinks 3 times.

2.7. Power supply

All Davicom and MEXM units operate from a 12 VDC power supply. Battery backup installations are strongly recommended to insure uninterrupted operation during power outages.

3. Input/Output configuration

Metering inputs, status inputs and relay outputs offer different user-configurable settings. The following sections present detailed DIP switch configurations specific to each setting.

3.1. Metering inputs

The metering inputs (MEXM-1 only) can be configured independently for any of the following input voltage ranges: ±2.5V, ±5V, ±10V, ±25V and ±50V. The voltage range selection is controlled through the DavLink software.

Caution: Do not exceed the voltage scale limits set for each metering input to prevent saturation of the internal amplifier.

Metering inputs are bipolar and have a minimum input impedance of 1MΩ. A detailed schematic is given in **Figure 6**.

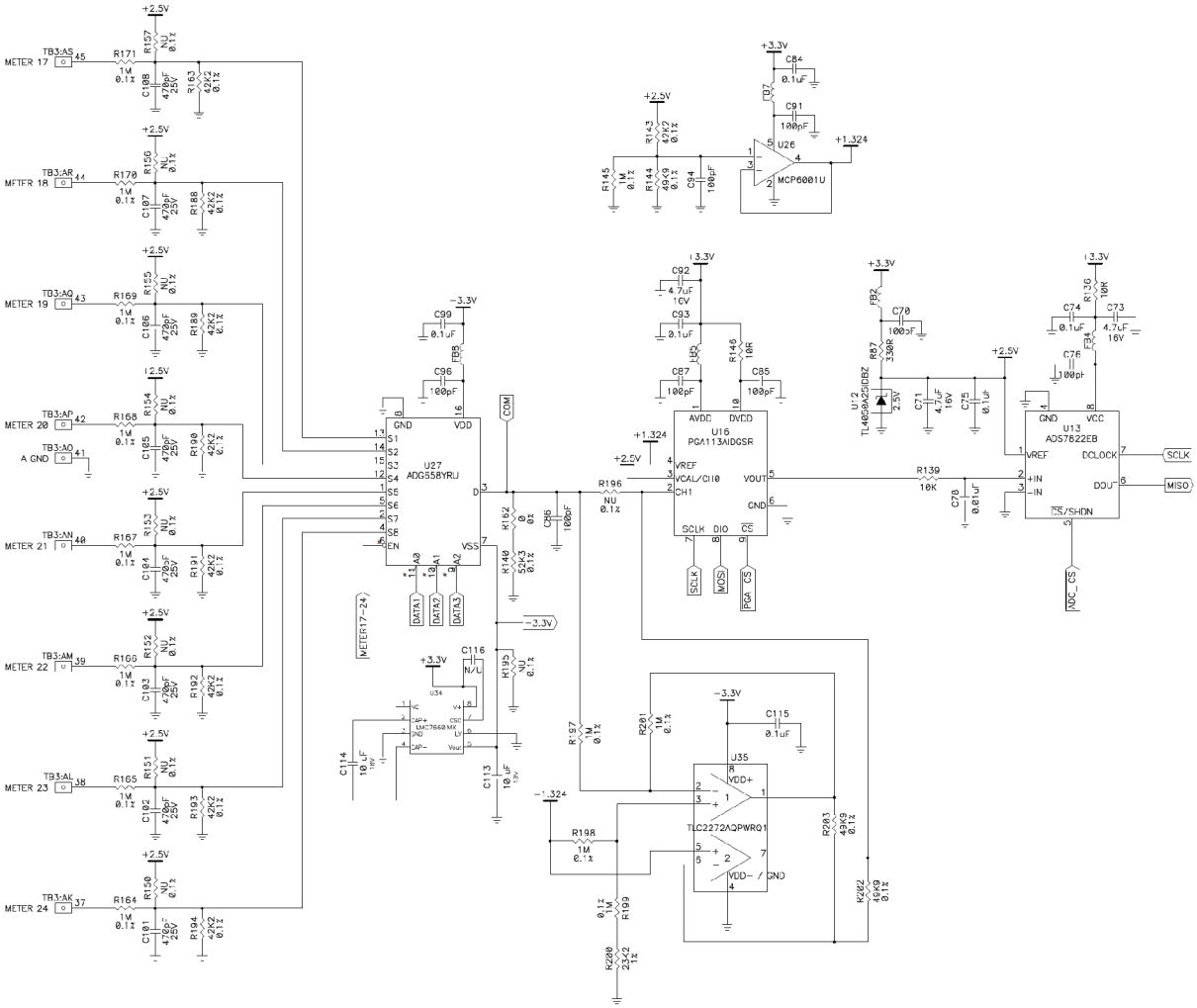

Figure 6 : Typical Metering input circuit

3.2. Status inputs

All status inputs are opto-isolated and the input impedance is greater than 22 kΩ. Input voltages ranging from –12 V to +0.8 V are considered a logic Low level, while voltages from +2.4 V to +12 V are considered a logic High level. DIP switches are used to place a 22 kΩ pull-up resistor IN or OUT on the status input positive terminal. DIP switches are also used to set the ground terminal to internal digital D or external (E). The MEXM-1 and MEXM-2 Status input circuits are different. The MEXM-1 external ground (E) is common to all 24 Status inputs while the MEXM-2 external ground is separate for each of the 64 Status inputs. This allows complete isolation between each of the Status inputs on the MEXM-2 when the pull-up is OUT and the ground is set to the E position in Wet-contact mode.

Note: Make sure the DIP switch settings of the MEXM unit match your status input signal source (the pull-up resistors shall be IN or OUT, see **Figure 7** and **Figure 8**).

3.2.1. Dry-contact (pull-up) configuration

When pull-up resistors are used, an open circuit is taken as a logic High and short to ground as a logic Low.

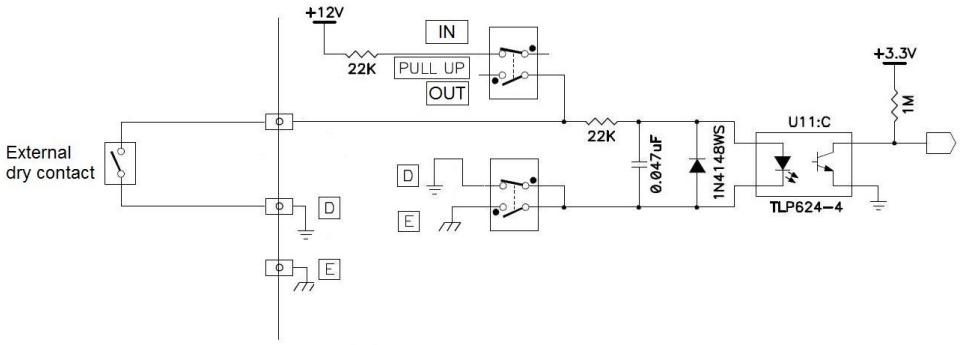

Figure 7 : MEXM-1 Status input connected in dry-contact (pull-up) mode

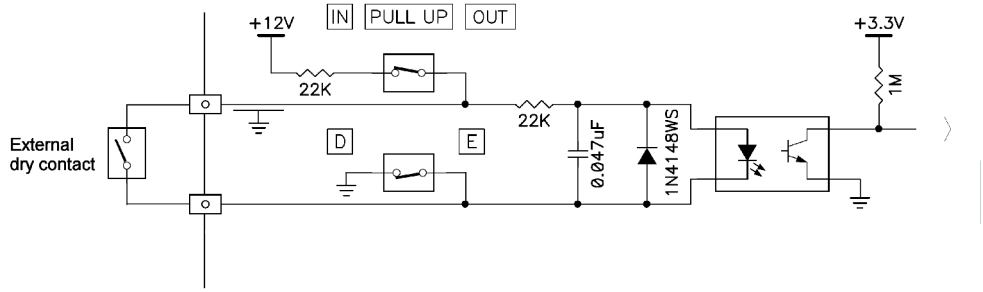

Figure 8 : MEXM-2 Status input connected in dry-contact (pull-up) mode

3.2.2. Wet-contact (external drive signal) configuration

To isolate the MEXM status inputs from other equipment, the terminal ground connection can be set to external (E) using a DIP switch. When the ground is set to external, voltage $+V_{in}$ in **Figure 9** and **Figure 10** must be greater than +2.4 VDC in order to activate the photodiode of the opto-coupler. In this case, an open circuit is considered as a logic Low, and a voltage higher than +2.4 VDC is considered as a logic High.

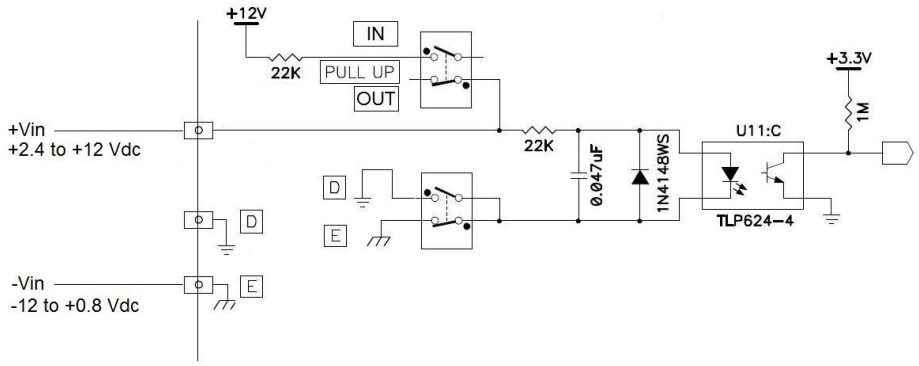

Figure 9 : MEXM-1 Status input connected in the wet-contact (external voltage) mode

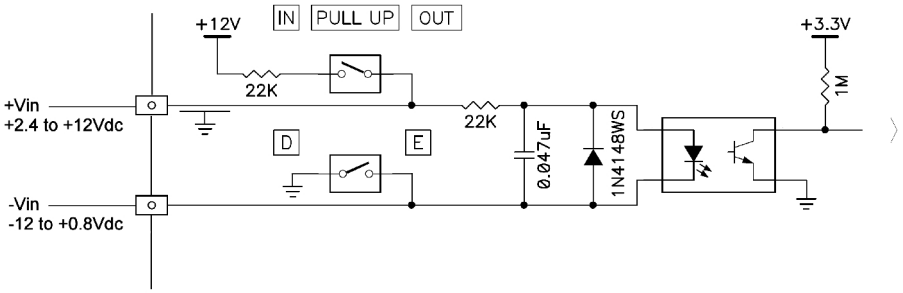

Figure 10 : MEXM-2 Status input connected in the wet-contact (external voltage) mode

3.2.3. Status input DIP switches

At the factory, Status input DIP switches are set for the dry-contact configuration with the internal pull-up IN (see **Table 4**). To gain access to the status inputs DIP switches, loosen the two screws retaining the clear plastic cover to the left of the MEXM module as shown in **Figure 11** and remove the cover.

The configuration of each of the 24 (MEXM-1) or 64 (MEXM-2) status inputs can be set independently. The number written between the two DIP switch rows indicates to which input the settings are applied.

NOTE: all 64 inputs on the MEXM-2 have independant external grounds, while the 24 inputs of the MEXM-1 have a common external ground.

Status input contact mode	Pull-up	Ground
Wet-contact	OUT	E
Dry-contact	IN	D

Table 4 : Status input DIP switch settings

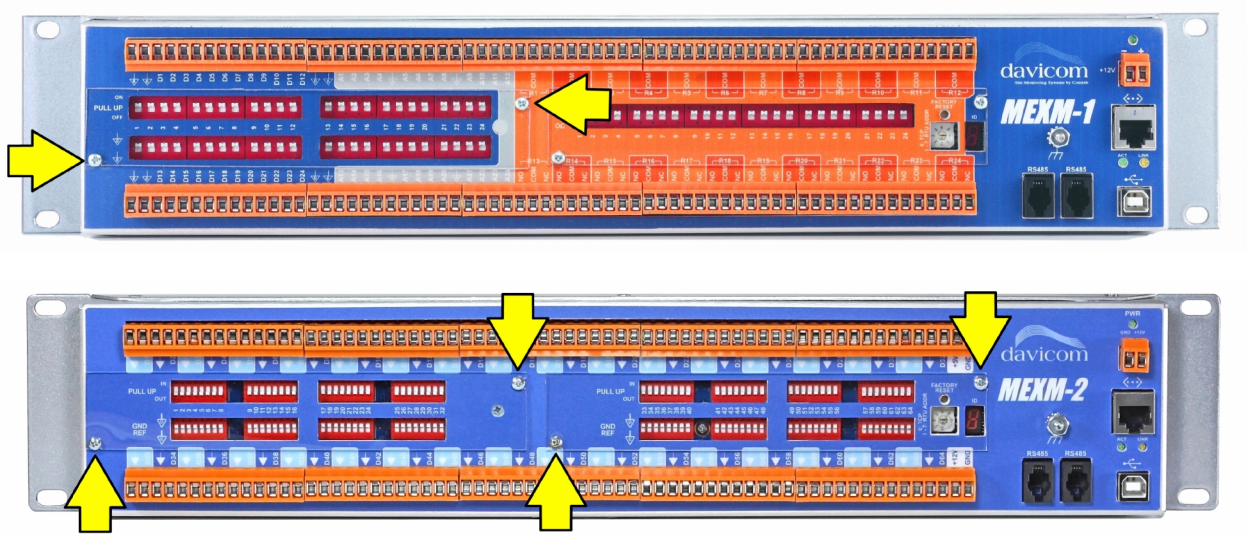

Figure 11: Status inputs DIP switch access and screw location for MEXM-1 and MEXM-2 units

3.3. Relay/Open-collector outputs

3.3.1. Relay/Open-collector output connections

The MEXM-1 module can control physical relays, or use them to route open collector contacts to the NC terminal, as shown in **Figure 12**.

The MEXM's physical relays provide high isolation and accept higher voltages and currents than the open collectors. Open collectors can be used to control equipment that have digital external control ports.

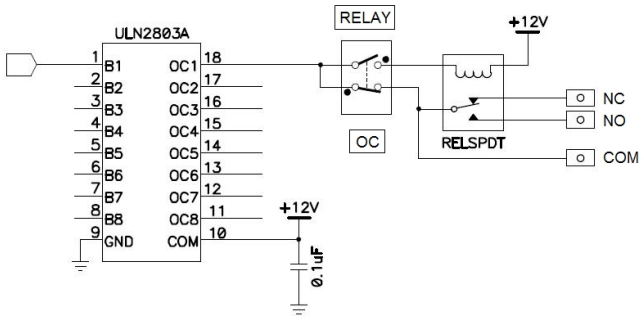

Figure 12 : Relay / Open collector output

3.3.1.1. Relay output

The MEXM-1 physical relays can support 0.4 A @ 70 VAC, and 2 A @ 30 VDC.

Relays can be wired normally-open (NO) or normally-closed (NC).

3.3.1.2. Open-collector output

Open collector outputs can support a DC current of 100 mA at 12 V.

Warning**:** Exceeding the MEXM-1 power supply voltage on the open collector can damage the transistor. For higher voltages, choose relay outputs instead of open collector outputs.

3.3.2. Relay DIP switches

At the factory, Relay DIP switches are set to Relay control. To gain access to the relay DIP switches, loosen the two screws retaining the clear plastic cover to the right of the MEXM-1 module (see **Figure 13**) and remove the cover.

Relay or open-collector controls are independently set for each of the 24 MEXM-1's outputs. The number between the two DIP switch rows indicates to which output the settings are applied.

Relay/Open-collector output mode	DIP switch Set to
Relay	RELAY
Open-collector	OC

Table 5 : Relay/Open-collector DIP switch settings

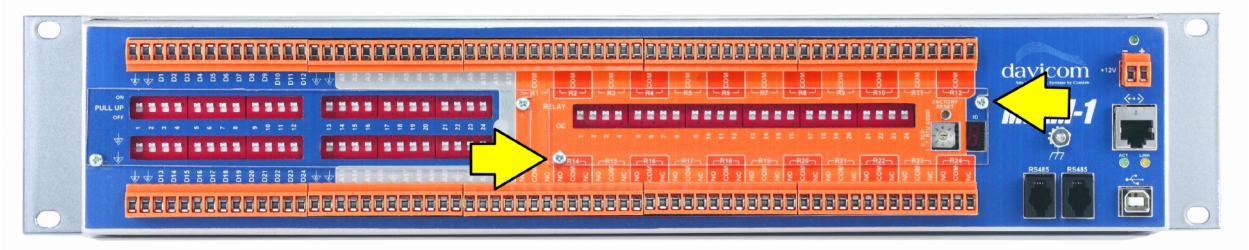

Figure 13 : Relays DIP switch access and screw location

In the Open-collector control settings, open-collector contacts are through the relay NC and COM terminals.

4. Configuring the Davicom unit to work with a MEXM

If you are not familiar with the Davicom unit and the DavLink software, please refer to Davicom Reference Manual (MAN1003).

4.1. MEXM autodetection by the Davicom

Autodetection is possible for both RTU and TCP connection mode. Note that these two modes are exclusive: mixed communication modes (simultaneous operation in both RTU and TCP mode) are not possible.

To add a MEXM to a Davicom unit configuration:

RTU MODE:

- If more than one MEXM is used: plug all units together in daisy-chain
- Set the communications-mode selector switch to any position between 1 and 7
- If more than one MEXM is used, make sure the communications-mode selector switches are set to different positions for each unit
- Power up the units
- Connect the USB cable from the first MEXM-1 to the Davicom unit
- In DavLink, go to ***Unit Configuration*** / ***Devices*** / ***ModBus*** and click on ***AutoDetect***

TCP MODE:

- Set the communications-mode selector switch to position 0
- Connect the ETHERNET cable to the MEXM and to the Davicom
- Power up the MEXM
- In DavLink, go to ***Unit Configuration*** / ***Devices*** / ***ModBus*** and click on ***AutoDetect***

4.2. Manually adding a MEXM as a Modbus slave in TCP

Go to ***Unit Configuration / Devices / ModBus Setup*** window and check that the settings are as shown below (**Figure 14**):

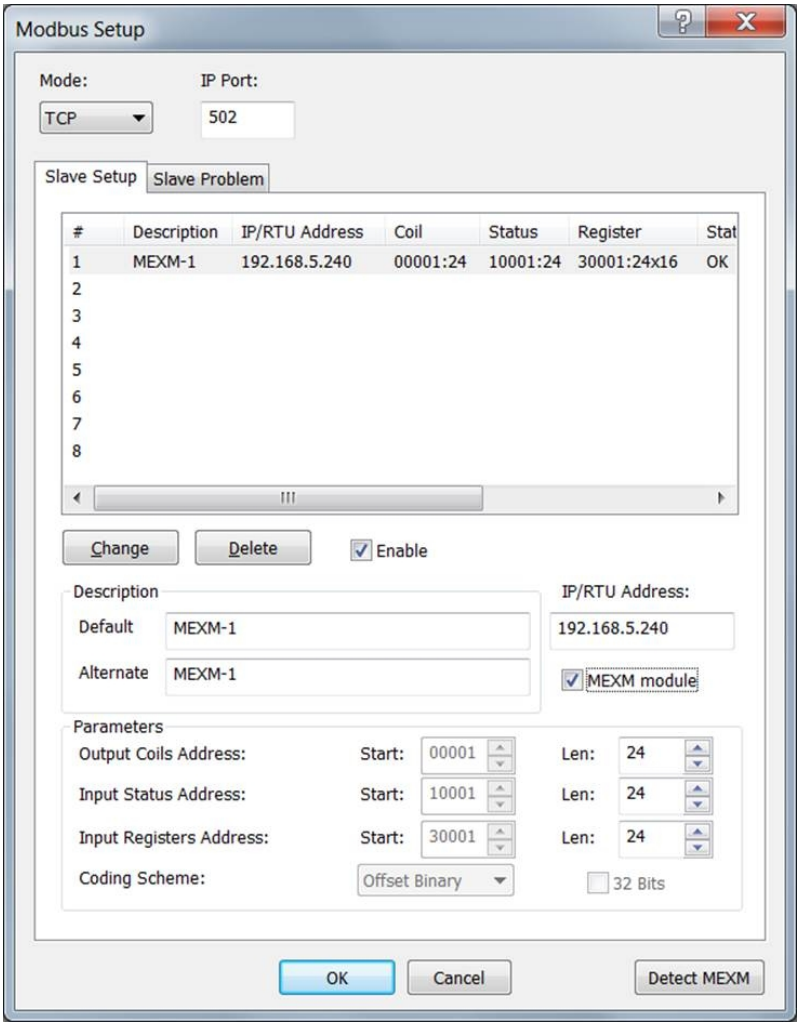

Figure 14: Manually adding a MEXM as a Modbus slave in TCP mode

Warning: the MEXM module checkbox must be checked for the MEXM to work properly.

To add another MEXM in TCP mode, select a blank entry in the Slave Setup table (**Figure 14**) and fill out the fields with the same parameters except the IP address which must be different for each additional unit and within the same subnet.

4.3. Manually adding a MEXM as a Modbus slave in RTU

Go to ***Unit Configuration*** / ***Devices*** / ***Modbus Setup*** window and fill in the information as shown in **Figure 15**.

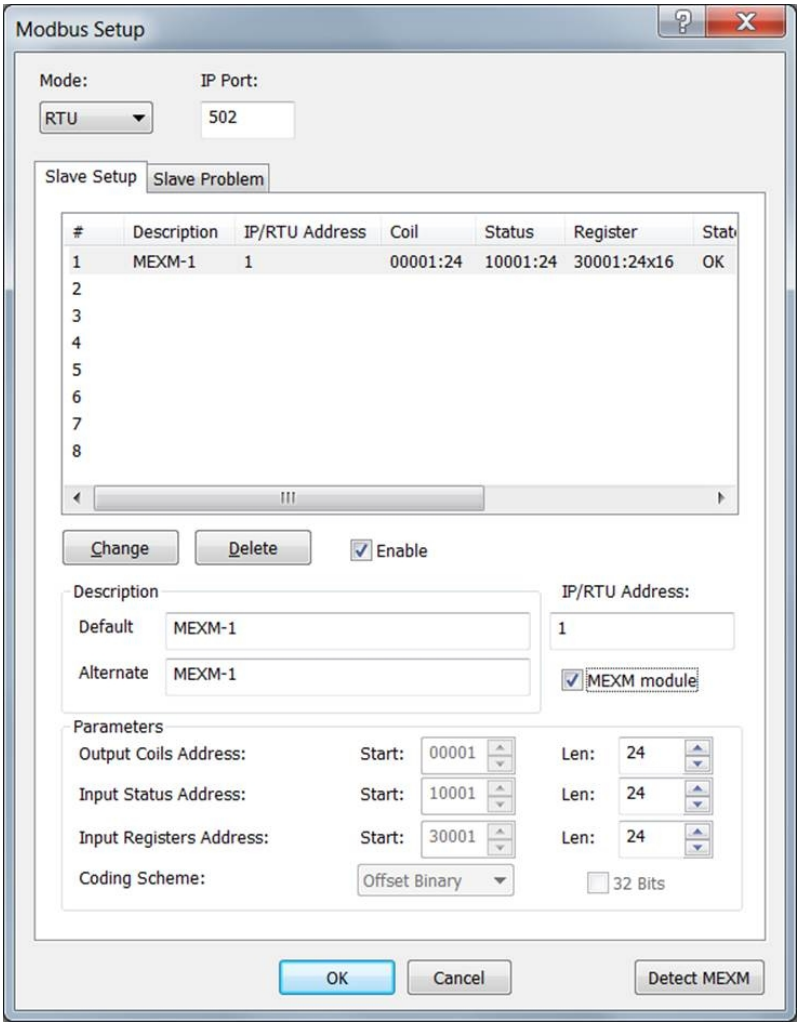

Figure 15 : Manually adding a MEXM-1 as a Modbus slave in RTU mode

Warning: the MEXM module checkbox must be checked for the MEXM to work properly.

To add more MEXM units in RTU mode, you have to select a blank entry line in the Slave Setup table (**Figure 15**) and fill in the blank fields with the same parameters except the RTU Address which must be the same as the one selected on the TCP / RTU communications-mode rotary switch of the MEXM.

4.4. Comm Loss settings

The Davicom can be configured to automatically signal an alarm, and/or enter Pause mode, when there is a communications problem between the MEXM and the Davicom. By default, the settings are set for: MAJ1 alarm call, Pause mode, High Sensitivity. These settings can be configured under the “Slave Problem” tab (see **Figure 16**) when the MEXM is set to the TCP or RTU communications mode.

The High, Medium, Low Sensitivity settings increase the tolerance of the Davicom to communications errors before declaring a COMM LOSS alarm.

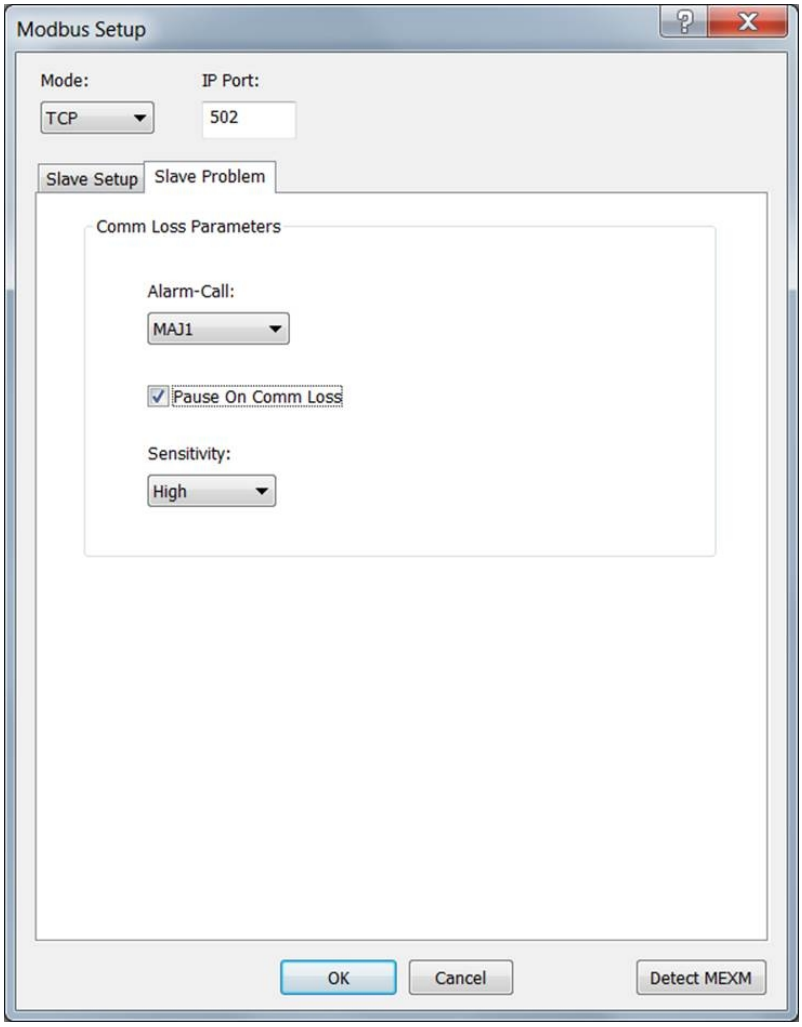

Figure 16 : Comm loss default parameters (TCP or RTU)

5. Maintenance/Firmware upgrade

The MEXM modules are built to be extremely reliable. This section covers maintenance procedures that may need to be performed at some time during the product life cycle.

Upgrade of the MEXM firmware is only possible through a Davicom unit with the use of DavLink or the Davicom Web Interface. Please refer to Davicom Reference Manual (MAN1003) for additional information.

For any additional information or troubleshooting help, please refer to the Davicom web site at www.davicom.com . It is continuously updated and should become your first stop for the most up-to-date information on the Davicom products.

6. Recycling your WEEE compliant MEXM unit (EC only)

The Waste Electrical & Electronic Equipment (WEEE) 2002/96/EC Directive ensures the proper recycling of waste resulting from any electrical and/or electronic items. The directive came into effect on August 13, 2005, and is only applicable for the European Member States.

Davicom MEXM modules comply with the WEEE Directive. These products are marked with the “crossed out wheeled bin” WEEE symbol in accordance with European Standard 50419.

Figure 17 : WEEE Symbol

This symbol on the product indicates that this product must not be disposed of with other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to the dealer where you purchased the product, or to Comlab, the manufacturer of the product. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

For MEXM modules sold in the European Union, Comlab will provide free recycling of those products once a customer has returned them to an authorized dealer of Davicom products and where a replacement MEXM module is being supplied. Where a replacement product is not being supplied, recycling services can be provided on request at additional cost.

7. Shipping your MEXM unit back to the factory/dealer

Please contact your local dealer or dvsupport@davicom.com for return instructions.

APPENDIX A Technical specifications

MEXM-1 Specifications

Metering inputs	Number	24
	Voltage ranges	±2.5, ±5, ±10, ±25, ±50 VDC
	Impedance	1MΩ
	Protection	Clamping diode
	Accuracy	1%
	A/D resolution	12 bits
	Connector type	Weidmuller pluggable screw terminal
Status inputs	Number	24
	Logic levels	High=+2.4 to +12VDC, Low=-12 to +0.8VDC. EIA compatible
	Impedance	>22kΩ
	Protection	Opto-isolated
	Ground	Internal or External, individually selectable
	Dry/wet contact	Individually selectable with pull-up resistor
	Connector type	Weidmuller pluggable screw terminal
Outputs	Number	24
	Type	Form C Relay or Open collector, individually selectable
	Rating	70VAC@0.4A, 30VDC@2A. Open collector at 100mA
	Connector type	Weidmuller pluggable screw terminal
Interface protocol	Modbus	RTU or TCP modes
RTU Mode	Connector	USB, RJ9 for daisy-chaining up to 7 units
TCP Mode	Connector	RJ45
Power supply		12VDC
Typical current requirements (mA) at 12VDC	Idle	150
	Startup	150
	Max (all relays energized)	480
Dimensions		48.3 cm x 8.7 cm x 3.6 cm 19" x 3.44" x 1.42" (including Weidmuller terminals)
Weight (unit only)		1.3 kg

Table 6 : MEXM-1 specifications

MEXM-2 Specifications

Status inputs	Number	64
	Logic levels	High=+2.4 to +12VDC, Low=-12 to +0.8VDC. EIA compatible
	Impedance	>22kΩ
	Protection	Opto-isolated
	Ground	Internal or External, individually selectable
	Dry/wet contact	Individually selectable with pull-up resistor
	Connector type	Weidmuller pluggable screw terminal
Auxilliary Power Outputs	+5V	250mA
	+12V	250mA
Interface protocol	Modbus	RTU or TCP modes
RTU Mode	Connector	USB, RJ9 for daisy-chaining up to 7 units
TCP Mode	Connector	RJ45
Power supply		12VDC
Typical current requirements (mA) at 12VDC	Idle	150
	Startup	150
Dimensions		48.3 cm x 8.7 cm x 3.6 cm 19" x 3.44" x 1.42" (including Weidmuller terminals)
Weight (unit only)		1.3 kg

Table 7 : MEXM-2 specifications

APPENDIX B Detailed Input/Output pinout for MEXM-1

POSITION	TOP ROW	BOTTOM ROW
1	External ground for wet-contact status input	External ground for wet-contact status input
2	Digital Ground for dry-contact status input	Digital Ground for dry-contact status input
3	Status Input 1	Status Input 13
4	Status Input 2	Status Input 14
5	Status Input 3	Status Input 15
6	Status Input 4	Status Input 16
7	Status Input 5	Status Input 17
8	Status Input 6	Status Input 18
9	Status Input 7	Status Input 19
10	Status Input 8	Status Input 20
11	Status Input 9	Status Input 21
12	Status Input 10	Status Input 22
13	Status Input 11	Status Input 23
14	Status Input 12	Status Input 24
15	Digital Ground for dry-contact status input	Digital Ground for dry-contact status input
16	External ground for wet-contact status input	External ground for wet-contact status input
17	Metering Input 1	Metering Input 13
18	Metering Input 2	Metering Input 14
19	Metering Input 3	Metering Input 15
20	Metering Input 4	Metering Input 16
21	Analog Ground	Analog Ground
22	Metering Input 5	Metering Input 17
23	Metering Input 6	Metering Input 18
24	Metering Input 7	Metering Input 19
25	Metering Input 8	Metering Input 20
26	Analog Ground	Analog Ground
27	Metering Input 9	Metering Input 21
28	Metering Input 10	Metering Input 22
29	Metering Input 11	Metering Input 23
30	Metering Input 12	Metering Input 24
31	Relay 1 normally open	Relay 13 normally open
32	Relay 1 common	Relay 13 common
33	Relay 1 normally closed	Relay 13 normally closed
34	Relay 2 normally open	Relay 14 normally open
35	Relay 2 common	Relay 14 common
36	Relay 2 normally closed	Relay 14 normally closed
37	Relay 3 normally open	Relay 15 normally open
38	Relay 3 common	Relay 15 common
39	Relay 3 normally closed	Relay 15 normally closed
40	Relay 4 normally open	Relay 16 normally open
41	Relay 4 common	Relay 16 common
42	Relay 4 normally closed	Relay 16 normally closed
43	Relay 5 normally open	Relay 17 normally open
44	Relay 5 common	Relay 17 common
45	Relay 5 normally closed	Relay 17 normally closed
46	Relay 6 normally open	Relay 18 normally open
47	Relay 6 common	Relay 18 common
48	Relay 6 normally closed	Relay 18 normally closed
49	Relay 7 normally open	Relay 19 normally open
50	Relay 7 common	Relay 19 common
51	Relay 7 normally closed	Relay 19 normally closed
52	cRelay 8 normally open	Relay 20 normally open
53	Relay 8 common	Relay 20 common
54	Relay 8 normally closed	Relay 20 normally closed
55	Relay 9 normally open	Relay 21 normally open

POSITION	TOP ROW	BOTTOM ROW
56	Relay 9 common	Relay 21 common
57	Relay 9 normally closed	Relay 21 normally closed
58	Relay 10 normally open	Relay 22 normally open
59	Relay 10 common	Relay 22 common
60	Relay 10 normally closed	Relay 22 normally closed
61	Relay 11 normally open	Relay 23 normally open
62	Relay 11 common	Relay 23 common
63	Relay 11 normally closed	Relay 23 normally closed
64	Relay 12 normally open	Relay 24 normally open
65	Relay 12 common	Relay 24 common
66	Relay 12 normally closed	Relay 24 normally closed

Table 8 : MEXM-1 I/O pinout

APPENDIX C Detailed Input/Output pinout for MEXM-2

POSITION	TOP ROW	BOTTOM ROW
1	Digital Ground for status input 1	Digital Ground for status input 33
2	Status Input 1	Status Input 33
3	Digital Ground for status input 2	Digital Ground for status input 34
4	Status Input 2	Status Input 34
5	Digital Ground for status input 3	Digital Ground for status input 35
6	Status Input 3	Status Input 35
7	Digital Ground for status input 4	Digital Ground for status input 36
8	Status Input 4	Status Input 36
9	Digital Ground for status input 5	Digital Ground for status input 37
10	Status Input 5	Status Input 37
11	Digital Ground for status input 6	Digital Ground for status input 38
12	Status Input 6	Status Input 38
13	Digital Ground for status input 7	Digital Ground for status input 39
14	Status Input 7	Status Input 39
15	Digital Ground for status input 8	Digital Ground for status input 40
16	Status Input 8	Status Input 40
17	Digital Ground for status input 9	Digital Ground for status input 41
18	Status Input 9	Status Input 41
19	Digital Ground for status input 10	Digital Ground for status input 42
20	Status Input 10	Status Input 42
21	Digital Ground for status input 11	Digital Ground for status input 43
22	Status Input 11	Status Input 43
23	Digital Ground for status input 12	Digital Ground for status input 44
24	Status Input 12	Status Input 44
25	Digital Ground for status input 3	Digital Ground for status input 45
26	Status Input 13	Status Input 45
27	Digital Ground for status input 14	Digital Ground for status input 46
28	Status Input 14	Status Input 46
29	Digital Ground for status input 15	Digital Ground for status input 47
30	Status Input 15	Status Input 47
31	Digital Ground for status input 16	Digital Ground for status input 48
32	Status Input 16	Status Input 48
33	Digital Ground for status input 17	Digital Ground for status input 49
34	Status Input 17	Status Input 49
35	Digital Ground for status input 18	Digital Ground for status input 50
36	Status Input 18	Status Input 50
37	Digital Ground for status input 19	Digital Ground for status input 51
38	Status Input 19	Status Input 51
39	Digital Ground for status input 20	Digital Ground for status input 52
40	Status Input 20	Status Input 52
41	Digital Ground for status input 21	Digital Ground for status input 53
42	Status Input 21	Status Input 53
43	Digital Ground for status input 22	Digital Ground for status input 54
44	Status Input 22	Status Input 54
45	Digital Ground for status input 23	Digital Ground for status input 55
46	Status Input 23	Status Input 55
47	Digital Ground for status input 24	Digital Ground for status input 56
48	Status Input 24	Status Input 56
49	Digital Ground for status input 25	Digital Ground for status input 57
50	Status Input 25	Status Input 57
51	Digital Ground for status input 26	Digital Ground for status input 58
52	Status Input 26	Status Input 58
53	Digital Ground for status input 27	Digital Ground for status input 59
54	Status Input 27	Status Input 59
55	Digital Ground for status input 28	Digital Ground for status input 60

POSITION	TOP ROW	BOTTOM ROW
56	Status Input 28	Status Input 60
57	Digital Ground for status input 29	Digital Ground for status input 61
58	Status Input 29	Status Input 61
59	Digital Ground for status input 30	Digital Ground for status input 62
60	Status Input 30	Status Input 62
61	Digital Ground for status input 31	Digital Ground for status input 63
62	Status Input 31	Status Input 63
63	Digital Ground for status input 32	Digital Ground for status input 64
64	Status Input 32	Status Input 64
65	+5V 250mA output	+12V 250mA
66	+5V GND	+12V GND

Table 9 : MEXM-2 I/O pinout

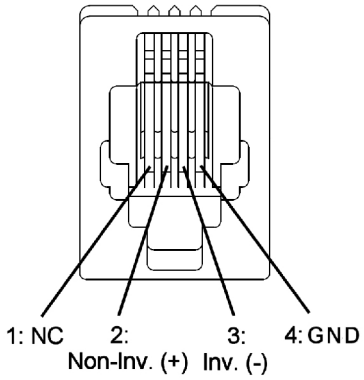

Figure 18: MEXM RJ9 connector pinout

APPENDIX D Mnemonic to use with Davlink / Web interface

MNEMONIC	DESCRIPTION
xMAyy	Metering Input (Analog)
xMDyy	Status Input (Digital)
xMRyy	Physical Relay

Table 10 : MEXM mnemonic to use with Davlink / Davicom Web interface

Where x is the MEXM ID or the line number of the MEXM in *Unit Configuration / Devices / Modbus Setup* and yy is the actual input / output number.

APPENDIX E MEXM Touch-tone telephone commands

COMMAND	DESCRIPTION
1x0Zyy#	Enable MEXM input
2x0Zyy#	Disable input
3x0Ryy#	Force-ON relay
4x0Ryy#	Force-OFF relay
5x0Ryy#	Release relay
6x0Ryy#	Pulse relay
7x0Zyy#	Input Reading

Table 11 : MEXM specific Davicom DTMF telephone commands

Where x is the MEXM ID or the line number of the MEXM in *Unit Configuration / Devices / Modbus Setup*, Z is the type of input or output (A = Metering input, D = Status input, R = relay) and yy is the actual input / output number.

APPENDIX F MEXM-1 I/O Modbus addresses

ADDRESS	DESCRIPTION	ATTRIBUTE
00001	Relay #1	Read / Write
00002	Relay #2	Read / Write
00003	Relay #3	Read / Write
00004	Relay #4	Read / Write
00005	Relay #5	Read / Write
00006	Relay #6	Read / Write
00007	Relay #7	Read / Write
00008	Relay #8	Read / Write
00009	Relay #9	Read / Write
00010	Relay #10	Read / Write
00011	Relay #11	Read / Write
00012	Relay #12	Read / Write
00013	Relay #13	Read / Write
00014	Relay #14	Read / Write
00015	Relay #15	Read / Write
00016	Relay #16	Read / Write
00017	Relay #17	Read / Write
00018	Relay #18	Read / Write
00019	Relay #19	Read / Write
00020	Relay #20	Read / Write
00021	Relay #21	Read / Write
00022	Relay #22	Read / Write
00023	Relay #23	Read / Write
00024	Relay #24	Read / Write
10001	Status input #1	Read only
10002	Status input #2	Read only
10003	Status input #3	Read only
10004	Status input #4	Read only
10005	Status input #5	Read only
10006	Status input #6	Read only
10007	Status input #7	Read only
10008	Status input #8	Read only
10009	Status input #9	Read only
10010	Status input #10	Read only
10011	Status input #11	Read only
10012	Status input #12	Read only
10013	Status input #13	Read only
10014	Status input #14	Read only
10015	Status input #15	Read only
10016	Status input #16	Read only
10017	Status input #17	Read only
10018	Status input #18	Read only
10019	Status input #19	Read only
10020	Status input #20	Read only
10021	Status input #21	Read only
10022	Status input #22	Read only
10023	Status input #23	Read only
10024	Status input #24	Read only
30001	Metering input#1	Read only
30002	Metering input#2	Read only
30003	Metering input#3	Read only

ADDRESS	DESCRIPTION	ATTRIBUTE
30004	Metering input#4	Read only
30005	Metering input#5	Read only
30006	Metering input#6	Read only
30007	Metering input#7	Read only
30008	Metering input#8	Read only
30009	Metering input#9	Read only
30010	Metering input#10	Read only
30011	Metering input#11	Read only
30012	Metering input#12	Read only
30013	Metering input#13	Read only
30014	Metering input#14	Read only
30015	Metering input#15	Read only
30016	Metering input#16	Read only
30017	Metering input#17	Read only
30018	Metering input#18	Read only
30019	Metering input#19	Read only
30020	Metering input#20	Read only
30021	Metering input#21	Read only
30022	Metering input#22	Read only
30023	Metering input#23	Read only
30024	Metering input#24	Read only

Table 12: MEXM-1 I/O Modbus addresses

APPENDIX G MEXM-2 I/O Modbus addresses

ADDRESS	DESCRIPTION	ATTRIBUTE
10001	Status input #1	Read only
10002	Status input #2	Read only
10003	Status input #3	Read only
10004	Status input #4	Read only
10005	Status input #5	Read only
10006	Status input #6	Read only
10007	Status input #7	Read only
10008	Status input #8	Read only
10009	Status input #9	Read only
10010	Status input #10	Read only
10011	Status input #11	Read only
10012	Status input #12	Read only
10013	Status input #13	Read only
10014	Status input #14	Read only
10015	Status input #15	Read only
10016	Status input #16	Read only
10017	Status input #17	Read only
10018	Status input #18	Read only
10019	Status input #19	Read only
10020	Status input #20	Read only
10021	Status input #21	Read only
10022	Status input #22	Read only
10023	Status input #23	Read only
10024	Status input #24	Read only
10025	Status input #25	Read only
10026	Status input #26	Read only
10027	Status input #27	Read only
10028	Status input #28	Read only
10029	Status input #29	Read only
10030	Status input #30	Read only
10031	Status input #31	Read only
10032	Status input #32	Read only
10033	Status input #33	Read only
10034	Status input #34	Read only
10035	Status input #35	Read only
10036	Status input #36	Read only
10037	Status input #37	Read only
10038	Status input #38	Read only
10039	Status input #39	Read only
10040	Status input #40	Read only
10041	Status input #41	Read only
10042	Status input #42	Read only
10043	Status input #43	Read only
10044	Status input #44	Read only
10045	Status input #45	Read only
10046	Status input #46	Read only
10047	Status input #47	Read only
10048	Status input #48	Read only
10049	Status input #49	Read only
10050	Status input #50	Read only
10051	Status input #51	Read only
10052	Status input #52	Read only
10052	Status input #53	Read only
10054	Status input #54	Read only
10055	Status input #55	Read only

ADDRESS	DESCRIPTION	ATTRIBUTE
10056	Status input #56	Read only
10057	Status input #57	Read only
10058	Status input #58	Read only
10059	Status input #59	Read only
10060	Status input #60	Read only
10061	Status input #61	Read only
10062	Status input #62	Read only
10063	Status input #63	Read only
10064	Status input #64	Read only

Table 13 : MEXM-2 I/O Modbus addresses