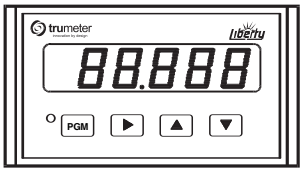
trumeter
innovation by design

Liberty CE

# 877X-X

Ratemeter / Process Timer
Ratemeter / Prozess Zeitzähler
Tachymètre / Indicateur de temps de Processus
Tacómetro / Temporizador Proceso
Tachimetro / Timer Processo




**DIGITAL PANEL METERS**
**WARNING read page 2 first!**



**DIGITALE EINBAU-MESSINSTRUMENTE**
**ACHTUNG: Lesen Sie zuerst Seite 3!**



**INDICATEURS NUMERIQUES DE TABLEAU**
**RECOMMANDATION IMPORTANTE:**
**Reportez-vous tout d'abord à la page 4!**



**INSTRUMENTOS DE MEDIDA PANEL DIGITAL**
**ATENCIÓN: Primero lea la página 6!**



**MISURATORI DIGITALI A PANNELLO**
**ATTENZIONE: Leggere prima a pagina 7**




019060-01 Issue 4.0 01/12

## WARNING

**Installation and maintenance must be carried out by suitably qualified personnel only. Hazardous voltages may be present on the connection terminals.**

## Installation

This product is intended to be installed in accordance with the operating and installation requirements of Overvoltage Category II and Pollution Degree 2 (as defined by IEC 664).

It must be fitted in a suitable enclosure which is accessible to qualified personnel only.

An external supply fuse must be fitted. The recommended fuse is:

**DC supply** - S504-2A manufactured by Bussmann.

Fuse details: Antisurge 2A, Rating 50V , Breaking capacity 35A @50V, UL recognised (file no E75865), complies with IEC127.

**AC supply** - S504-200mA manufactured by Bussmann.

Fuse details: Antisurge 200mA, Rating 250VAC , Breaking capacity 35A @250VAC, UL recognised (file no E75865), complies with IEC127.

The relay output circuits must be fitted with fuses suitable for the voltage and current being switched.

Maximum fuse ratings:

| | | |
|---|---|---|
| 250VAC | @ cosØ= 1 | fuse rating 5A |
| 30VDC | @ cosØ= 1 | fuse rating 5A |

All conductors carrying hazardous voltage should have external switching or disconnect mechanisms fitted which provide at least 3mm of contact separation in all poles.

**Failure to install or operate the unit in accordance with the above requirements may result in the electrical safety of the unit being impaired.**

## Maintenance

**Ensure that all power sources to the unit are isolated prior to maintenance, inspection or cleaning.**

There are no user serviceable parts inside this unit. Under no circumstances should the case be opened.

All external wiring connections should be inspected at regular intervals. Any damaged wiring should be replaced and any loose connections should be retightened.

Cleaning should be carried out using a dry cloth to wipe the casing of the unit.

## Programming

**Caution:** If the optional relay output and/or analog output board(s) are installed in the DPM, then entering Program mode will cause both relays to release and the analog output to go to its minimum value (0V or 4 mA) regardless of the input signal value.

## Diagnostics

**Caution:** Performing the diagnostic tests will turn on the analog output and operate the relays if those options are installed. First remove power from the DPM and disconnect the outputs from any loads that should not be turned on. If the optional RS485 communication board is installed, the DPM will respond with the scaled input value to the QST command.

---

## ACHTUNG

**INSTALLATION UND WARTUNG DÜRFEN NUR VON ENTSPRECHEND GESCHULTEN MITARBEITERN VORGENOMMEN WERDEN. AN DEN ANSCHLUSSKLEMMEN KÖNNEN LEBENSGEFÄHRLICHE HOCHSPANNUNGEN ANLIEGEN.**

## Installation

Dieses Produkt ist gemäss den Betriebs- und Installationsanforderungen von Schutzklasse II und Funkstörklasse 2 (entsprechend der Definition durch IEC 664) zu installieren.

Es muss in einem geeigneten Schutzbereich aufgestellt werden, der nur für entsprechend geschulte Mitarbeiter zugänglich ist.

In die externe Versorgung muss eine Sicherung eingesetzt werden. Empfohlen werden Sicherungen vom:

**Versorgung DC** - S504-2A, zB hergestellt von Bussmann.

Kenndaten der Sicherung: Absicherung gegen Stromspitzen 2A, Sicherungsbemessung 50V, Ausschaltleistung 35A bei 50VAC, anerkannt durch UL (Aktenzeichen E75865), entspricht IEC127.

**Versorgung AC** - S504-200mA, zB hergestellt von Bussmann.

Kenndaten der Sicherung: Absicherung gegen Stromspitzen 200mA, Sicherungsbemessung 250VAC, Ausschaltleistung 35A bei 250VAC, anerkannt durch UL (Aktenzeichen E75865), entspricht IEC127.

Die Ausgangsschaltkreise des Relais müssen mit geeigneten Sicherungen entsprechend den geschalteten Spannungen und Strömen versehen werden.

Maximale Sicherungsnennwerte:

| | | |
|---|---|---|
| 250VAC | @ cosØ= 1 | Sicherungsnennwert 5A |
| 30VDC | @ cosØ= 1 | Sicherungsnennwert 5A |

Alle Stromleiter, an denen gefährliche Spannungen anliegen, müssen mit externen Schalt- oder Trennvorrichtungen versehen werden, die einen Kontaktabstand von mindestens 3 mm an allen Polen herstellen.

**Wenn das Gerät nicht entsprechend den vorstehenden Anforderungen installiert und betrieben wird, ist die elektrische Sicherheit des Geräts nicht gewährleistet.**

## Wartung

**Alle Stromquellen des Geräts müssen vor Wartungs-, Inspektions- und Reinigungsmaßnahmen isoliert werden.**

Benutzerseitige Maßnahmen an den Teilen im Geräteinneren sind nicht möglich. Das Gehäuse darf unter keinen Umständen geöffnet werden.

Alle externen Kabelverbindungen müssen in regelmäßigen Abständen inspiziert werden. Beschädigte Kabelverbindungen müssen ersetzt und lose Verbindungen nachgezogen werden.

Die Reinigung des Gerätes ist durch Abwischen des Gehäuses mit einem trockenen Tuch vorzunehmen.

## Programmierung

**Achtung:** Falls die Optionskarten Relaisausgang und/oder Analogausgang im DPM installiert sind, so bewirkt das Aufrufen des Programmierungsmodus, dass beide Relais freigegeben werden und dass der Analogausgang auf seinen Minimumwert (0V oder 4mA) gesetzt wird, unabhängig vom Wert des Eingangssignals.

## Diagnose

**Achtung:** Die Durchführung der Diagnosetests bewirkt das Einschalten des Analogausgangs und des Betriebs der Relais, falls die Optionskarte Relais installiert ist. Zuerst die Versorgung des DPM abschalten und die Ausgänge von allen Lasten abklemmen, die nicht eingeschaltet sein sollen. Falls die Optionskarte Kommunikation RS485 installiert ist, reagiert das DPM auf den Befehl QST mit dem proportionalen Eingangswert.

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# RECOMMANDATION IMPORTANTE

**L'INSTALLATION ET L'ENTRETIEN DOIVENT ETRE REALISES UNIQUEMENT PAR UN PERSONNEL SPECIALEMENT QUALIFIE. DES TENSIONS DANGEREUSES PEUVENT ETRE PRESENTES SUR LES BORNIERS DE RACCORDEMENT.**

## Installation

Ce produit doit être installé conformément aux normes Surtension Catégorie II et Pollution Niveau 2 de fonctionnement et d'installation (selon les réglementations IEC 664).

Il doit être inséré dans un boîtier adapté uniquement accessible au personnel qualifié.

Une alimentation externe doit être prévue. Le type de fusible recommandé est:

**Alimentation CC** - S504-2A fabriqué par Bussman.

Détails du fusible : fusible à action temporisée 2A, Calibre 50V, Capacité de coupure 35A @50VCC, homologué UL (fichier n° E75865), en conformité aux réglementations IEC127.

**Alimentation CA** - S504-200mA fabriqué par Bussman.

Détails du fusible : fusible à action temporisée 200mA, Calibre 250VCA, Capacité de

coupure 35A @250VCA, homologué UL (fichier n° E75865), en conformité aux réglementations IEC127.

Les circuits de sortie de relais doivent être munis de fusibles adaptés aux tensions et courants commutés.

Protection maximale du fusible :

| | | |
|---|---|---|
| 250VCA | @ cosØ= 1 | Protection du fusible 5A |
| 30VCC | @ cosØ= 1 | Protection du fusible 5A |

Tous les conducteurs avec tension à risques doivent être munis d'interrupteurs externes ou de sectionneurs ayant au moins 3 mm de séparation de contact sur tous les pôles.

**L'inobservation des instructions ci-dessus lors de l'installation ou de la mise en service peuvent provoquer des problèmes de sécurité électrique pouvant endommager l'appareil.**

## Entretien

**Veiller à ce que toutes les tensions d'alimentation de l'appareil soient isolées avant d'effectuer des travaux de maintenance, d'inspection ou de nettoyage.**

Aucune pièce de cet appareil n'est réparable par l'utilisateur. Le boîtier ne doit pas être ouvert, sous aucun prétexte.

Tous les branchements extérieurs doivent être inspectés à intervalles réguliers. Tout fil endommagé doit être remplacé et toutes les connexions desserrées doivent être resserrées.

Le nettoyage doit être fait avec un chiffon sec pour dépoussiérer le boîtier de l'unité.

## Programmation

**Avertissement :** Si les carte optionnelles Relais et Sortie analogique sont installées dans le DMP, l'accès au mode Programme provoque le déclenchement des deux relais et les valeurs minimales de la sortie analogique (0V ou 4mA), indépendamment de la valeur du signal d'entrée.

## Diagnostique

**Avertissement :** L'exécution des tests de diagnostique activera la sortie analogique et mettra en marche les relais si ces options sont installées. Avant tout coupez l'alimentation du DPMet débranchez les sorties de toute charge ne devant pas être activée. Si la plaquette de communication RS485 optionnelle est installée, le DPM donnera la valeur entrante réduite à la commande QST.

## ATENCION

**LA INSTALACION Y EL MANTENIMIENTO DEBE SER EFECTUADO CONVENIENTEMENTE SOLAMENTE POR PERSONAL CAPACITADO. PUEDEN HABER VOLTAJES PELIGROSOS EN LOS TERMINALES DE CONEXION.**

## Instalación

Este producto está destinado para ser instalado de acuerdo con los requerimientos de operación e instalación de la Categoría II de Sobrevoltaje y Grado 2 de Contaminación (como está definido por IEC 664).

Debe ser colocado en un apropiado contenedor al cual tenga acceso solamente personal capacitado.

Hay que montar un fusible de alimentación exterior. El fusible recomendado es:

**Alimentación CC** - S504-2A fabricado por Bussmann.

Detalles del Fusible: Sobrecorriente 2A, Servicio 50 V, Poder de Interrupción 35A a 50VCC, reconocido por UL (ficha N° E75865), de acuerdo con las normas IEC127.

**Alimentación CA** - S504-200mA fabricado por Bussmann.

Detalles del Fusible: Sobrecorriente 200 mA, Servicio 250 VAC , Poder de Interrupción 35A a 250VCA, reconocido por UL (ficha N° E75865), de acuerdo con las normas IEC127.

Los circuitos de salida del relé deben estar instalados con fusibles apropiados de acuerdo a los valores máximos de voltaje y corriente que se conmutan.

Máximos valores de los fusibles:

| | | |
|---|---|---|
| 250VCA | @ cosØ= 1 | valor del fusible 5A |
| 30VCC | @ cosØ= 1 | valor del fusible 5A |

Todos los conductores que lleven voltajes peligrosos deben tener instalados mecanismos externos de interrupción o desconexión que provea una separación entre los contactos de por lo menos 3mm en todos los polos.

**Podría afectarse la seguridad eléctrica de la unidad si ésta no se instala o se opera de acuerdo a los requerimientos anteriormente mencionados.**

## Mantenimiento

**Asegúrese que todas las fuentes de energía de la unidad estén aisladas con anterioridad al mantenimiento, inspección o limpieza.**

No hay ningún componente dentro de esta unidad que pueda repararse por el usuario. Bajo ninguna circunstancia la caja debe ser abierta.

Todas las conexiones del cableado externo deben inspeccionarse periodicamente.

Deben reemplazarse todos los cables dañados y debe ajustarse toda conexión floja.

La limpieza sobre la caja de la unidad debe efectuarse utilizandose un paño seco.

## Programación

**Atención:** Si se ha instalado en el DPM una salida del relé opcional y/o un cuadro(s) de salida analógica, cuando se entre la modalidad programa se producirá el disparo de los dos relés y la salida analógica se pondrá en su valor mínimo (0V o bien 4mA) indiferentemente de cuál sea el valor de la señal de entrada.

## Diagnósticos

**Atención:** Cuando se realicen los tests de diagnóstico se conectará la salida analógica y se accionarán los relés si dichas opciones han sido instaladas. Primero quitar la alimentación del DPM y desconectar las salidas de todas las cargas que pudieran estar conectadas. Si ha sido instalado el cuadro de comunicación opcional RS485, el DPM contestará con el valor de entrada reducido en la señal de mando QST.

---

## ATTENZIONE

**L'INSTALLAZIONE E LA MANUTENZIONE DEVONO ESSERE ESEGUITE ESCLUSIVAMENTE DA PERSONALE DEBITAMENTE QUALIFICATO. IN CORRISPONDENZA DEI MORSETTI DI COLLEGAMENTO POTREBBERO ESSERE PRESENTI TENSIONI PERICOLOSE.**

## Installazione

Il presente prodotto deve essere installato secondo i requisiti di funzionamento e installazione della Categoria di Sovratensione II ed il Grado di Inquinamento 2 (come definito da IEC 664).

L'unità deve essere installata in una idonea custodia, accessibile unicamente al personale qualificato.

E' necessario installare un fusibile di alimentazione esterno:

**Alimentazione CC** - S504 - 2A prodotto da Bussmann.

Resistenza a sovracorrenti transitorie 2A, tensione 50V, capacità di apertura 35A a 50VCC, omol. UL (reg. n°. E75865), conforme a IEC127.

**Alimentazione AC** - S504 - 200mA prodotto da Bussmann.

Resistenza a sovracorrenti transitorie 200mA, tensione 250VAC, capacità di apertura 35A a 250VAC, omol. UL (reg. n°. E75865), conforme a IEC127.

I circuiti di uscita a relè devono essere equipaggiati con fusibili compatibili con la tensione e la corrente di commutazione.

Valori massimi fusibile:

| | | |
|---|---|---|
| 250VAC | @ cosØ= 1 | valori fusibile 5A |
| 30VCC | @ cosØ= 1 | valori fusibile 5A |

Tutti i conduttori che portano tensioni pericolose devono essere dotati di meccanismi di commutazione o scollegamento esterni che garantiscano almeno 3 mm di separazione a livello di tutti i poli.

**L'installazione o l'utilizzo dell'unità in contravvenzione con i requisiti che precedono può compromettere la sicurezza elettrica dell'unità.**

## Manutenzione

**Assicurarsi che tutte le fonti di alimentazione dell'unità siano adeguatamente isolate prima di procedere alla manutenzione, ispezione o pulizia.**

All'interno dell'unità non sono presenti componenti manutenibili dall'utente. Evitare nel modo più assoluto di aprire la custodia dello strumento.

Controllare regolarmente tutti i collegamenti esterni. Sostituire eventuali cavi danneggiati e riserrare qualsiasi collegamento allentato.

Utilizzare un panno asciutto per pulire la custodia dell'unità.

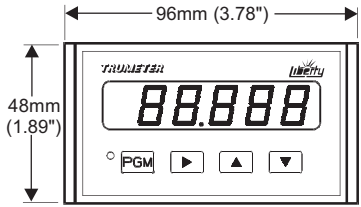
## Programmazione

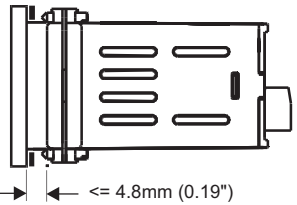
**Avvertenza:** Se nel DPM sono state installate la scheda di uscita relè e/o quella di uscita analogica opzionali, impostando il sistema in modalità Programmazione entrambi i relè verranno disattivati e l'uscita analogica verrà impostata sul valore minimo (0V o 4mA), indipendentemente dal valore del segnale di entrata.

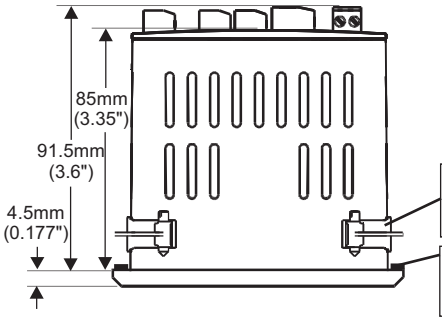
## Diagnostica

**Avvertenza:** L'esecuzione dei test diagnostici causa l'attivazione dell'uscita analogica e dei relè, nel caso in cui tali schede opzionali siano state installate. Innanzitutto, scollegare l'alimentazione dal DPM e le uscite da eventuali carichi che non devono essere attivati. Se la scheda di comunicazione RS485 opzionale è stata installata, il DPM risponde al comando QST con il valore di entrata adattato.

## Mounting, Montage, Montaje, Montaggio




92 x 45mm +0.4mm -0mm
(3.62 x 1.77" +0.015" - 0")

Fixing Clip, Befestigungsklammer
Clip de fixation, Clip fijación,
Clip di fissaggio

Sealing Gasket, Dichtung,
Joint d'étanchéité, Junta de goma,
Guarnizione frontale

DO NOT OVERTIGHTEN screws, or the gasket will be squeezed out from behind the bezel.

Die Schrauben NICHT ZU FEST ANZIEHEN, anderenfalls wird Dichtung aus dem Deckring gedrückt.

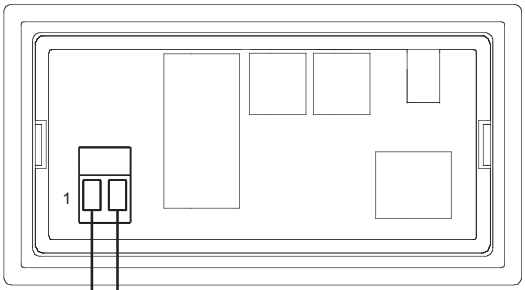
NE PAS TROP SERRER les vis, sans quoi la garniture sera chassée hors du logement.

NO APRETAR EN EXCESO los tornillos, o el obturador saltará afuera por detrás del bisel.

NON STRINGERE ECCESSIVAMENTE le viti altrimenti la guarnizione verrà spinta fuori dal frontale.

## Connections, Anschlüsse, Raccordements, Conexiones, Collegamenti

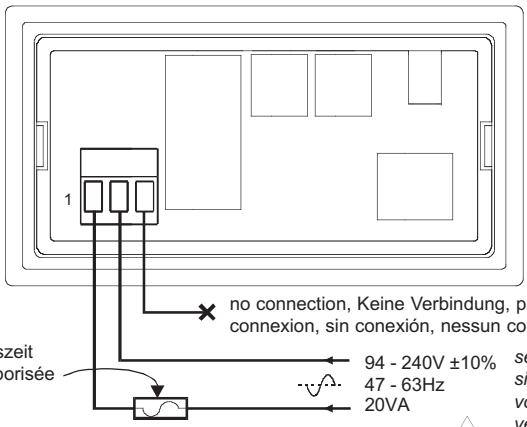
**Power Supply, Versorgung, Alimentation, Alimentación, Alimentazione**
**8770-X:** DC (CC)




**2.0A, 50V**
Anti-surge
Verzögerungszeit
À action temporisée
Temporizado
Ritardato

*see page 2*
*siehe Seite 3*
*voir page 4*
*ver página 6*
*vedi pagina 7*

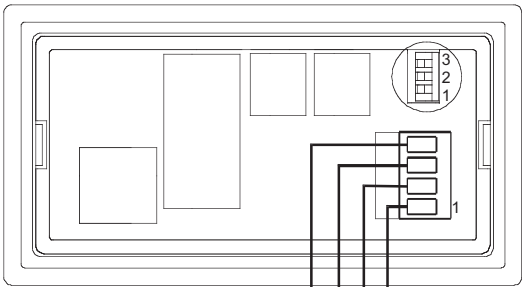
**Power Supply, Versorgung, Alimentation, Alimentación, Alimentazione**
**8771-X:** AC (CA)




**0.2A, 250V**
Anti-surge
Verzögerungszeit
À action temporisée
Temporizado
Ritardato

*see page 2*
*siehe Seite 3*
*voir page 4*
*ver página 6*
*vedi pagina 7*

## Input, Eingang, Entrée, Entrada, Ingresso

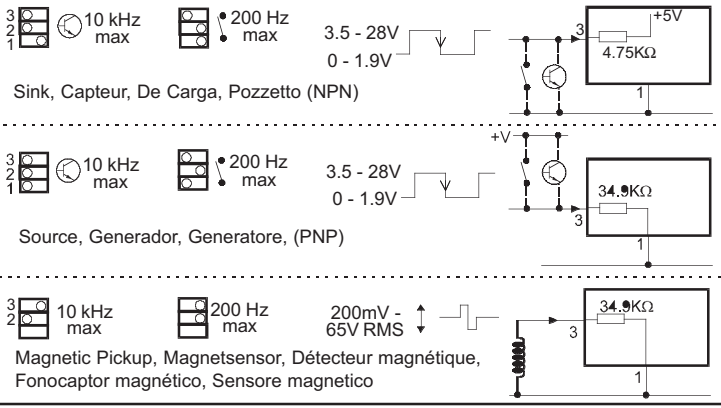



4: Output, Ausgang,
Sortie, Salida, Uscita +12V @ 25mA

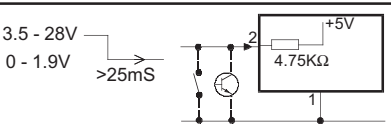
3: } see below, siehe unten, voir ci-dessous
2: } ver abajo, vedi sotto

1: 0V, Common, Masse, Commun, Común, Comune

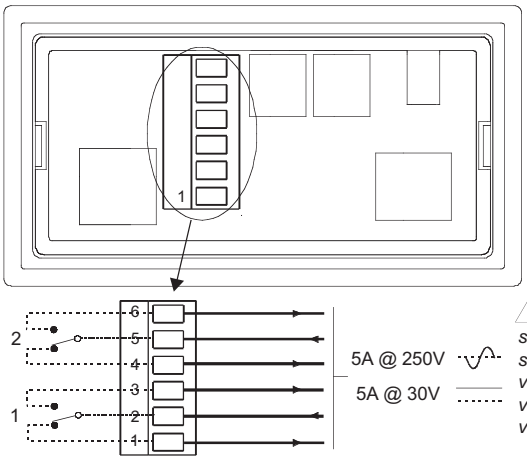
### 3: Input, Eingang, Entrée, Entrada, Ingresso




### 2: Program enable, Aktivierung der Programmierung, validation du Programme, Habilita el programa, Attivazione programmazione



**Option Board, Optionskarte, Cartes en option,**
**Cuadro opcional, Scheda opzionale 877X-1, 877X-3, 877X-5, 877X-7:**
Relay, Relais, Relé, Relè
*see page 23, siehe Seite 23, voir page 23, ver página 23, vedi pagina 23*




Relays shown in released (not operated) state.

Die Relais werden im freigegebenen Zustand (nicht in Betrieb) wiedergegeben.

Relais au repos ( non commandé)

Relés en posición de reposo (desexcitados).

Relè diseccitato (non azionati).

**Note:** An RC surge suppressor is recommended across inductive loads.

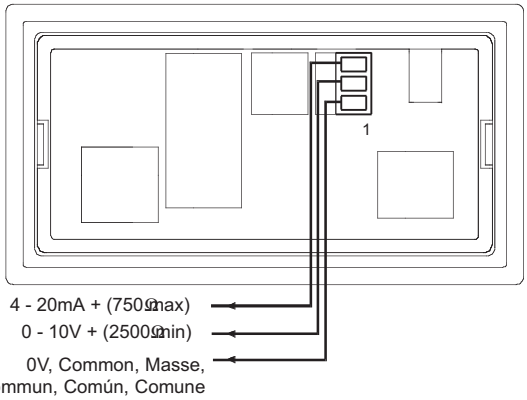
**Hinweis:** Es wird empfohlen, zwischen induktiven Lasten einen RC-Stromstoßstabilisator einzusetzen.

**Remarque:** une protection RC de surtension est recommandée pour les charges inductives.

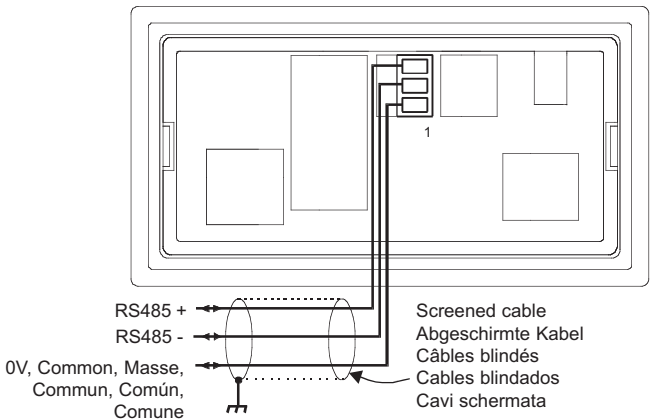
**Nota:** Se recomienda un compresor de sobrevoltaje RC por encima de las cargas inductivas.

**Nota:** Si consiglia un soppressore RC di sovracorrenti transitorie verso i carichi induttivi.

**Option Board, Optionskarte, Cartes en option,**
**Cuadro opcional, Scheda opzionale 877X-2, 877X-3, 877X-6, 877X-7:**
Analog Output, Analogausgang, sortie analogique,
Salida analógica, Uscita Analogica
*see page 24, siehe Seite 24, voir page 24, ver página 24, vedi pagina 24*




**Option Board, Optionskarte, Cartes en option,**
**Cuadro opcional, Scheda opzionale 877X-4, 877X-5, 877X-5, 877X-7:**
RS485 *see page 24, siehe Seite 24, voir page 24, ver página 24, vedi pagina 24*



## Specification

### AC Power Supply (8771-X)

**Input Power**
94-240 VAC ±10%, 20 VA
47-63 Hz

**External Fuse**
0.2A, 250 VAC, Time Delay (T200mA, 250V)

**Isolation**
2300 VAC

### DC Power Supply (8770-X)

**Input Power**
9-30 VDC, 12 VA
Reverse voltage protection

**External Fuse**
2.0A, 50 VDC, Time Delay (T2A, 50V)

**Isolation**
2300 VAC to signal inputs and relays, 500 VAC to RS485 and analog outputs

### DC Power Output

12V DC ± 12% 75mA max
Short circuit protection

### Relay option board (877X-1, 877X-3, 877X-5, 877X-7)

**Relays**
2 SPCO

**Contacts**
5A, 250V AC or 30V DC

**Isolation**
2300V AC

### Analog Output option board (877X-2, 877X-3, 877X-6, 877X-7)

**Outputs**
4-20mA DC (<750Ω load), 0-10V DC (>2500Ω load)

**Accuracy**
± 0.13% full scale 100ppm/°C
**+** 0.07% full scale change over 4-20mA load range

**Isolation**
2300V AC to signal inputs, relays and AC power supply, 500V AC to RS485 and DC power supply

**14** ---> *page 16*

## Spezifikation

### Versorgung AC (8771-X)

**Eingang Netzstrom**
94-240 VAC ±10%, 20 VA
47-63 Hz

**Externe Sicherung**
0,2A 250 VAC, Verzögerungszeit (T200mA, 250V)

**Isolierung**
2300 VAC

### Versorgung DC (8770-X)

**Eingang Netzstrom**
9-30 VDC, 12 VA
Rückspannungsschutz

**Externe Sicherung**
2,0A 50 VDC, Verzögerungszeit (T2A, 50V)

**Isolierung**
2300 VAC an Signaleingänge und Relais, 500 VAC an RS 485 und Analagausgänge

### Ausgäng DC

12V DC ± 12% 75mA max
Kurzschlussschutz

### Relaisoptionskarte (877X-1, 877X-3, 877X-5, 877X-7)

**Relais**
2 SPCO

**Kontakt**
5A, 250V AC oder 30V DC

**Isolierung**
2300V AC

### Analagausgänge-optionskarte (877X-2, 877X-3, 877X-6, 877X-7)

**Ausgänge**
4-20mA DC (<750Ω zwische), 0-10V DC (>2500Ω zwische)

**Toleranz**
± 0,13% Skalenendwert 100ppm/°C
**+** 0,07% Skalenendwertänderung über 4-20mA Lastbereich

**Isolierung**
2300V AC an Signaleingänge und Relais und Versorgung AC, 500V AC an RS485 und Versorgung DC

---> *Seite 16*

## Caractéristiques

### Alimentation CA (8771-X)

**Alimentation en entrée**
94-240 VCA, ±10%, 20 VA
47-63 Hz

**Fusible externe**
0.2A, 250 VCA, à action temporisée (T200mA, 250V)

**Isolation**
2300 VCA

### Alimentation CC (8770-X)

**Alimentation en entrée**
9-30 VCC, 12 VA
Protection inversion de polarité

**Fusible externe**
2.0A, 50 VCC, à action temporisée (T2A, 50V)

**Isolation**
2300 VCA aux entrées de signal et relais, 500 VCA au RS485 et aux sorties analogiques

### Alimentation auxiliaire

12V DC ± 12% 75mA max
Protection court-circuit

### Carte relais en option (877X-1, 877X-3, 877X-5, 877X-7)

**Relais**
2 SPCO, 2 contacts RCT

**Contacts**
5A, 250V CA ou 30V CC

**Isolation**
2300V CA

### Carte sortie analogique en option (877X-2, 877X-3, 877X-6, 877X-7)

**Sortie**
4-20mA CC (<750Ω charge), 0-10V CC (>2500Ω charge)

**Précision**
± 0.13% pleine échelle 100ppm/°C
**+** 0.07% pleine échelle sur plage du 4-20mA

**Isolation**
2300V CA aux entrées de signal, relais et alimentation CA, 500V CA au RS485 et alimentation CC

---> *page 16*

## Especificaciones

**Alimentación CA (8771-X)**

**Potencia de entrada**
94-240 VCA, ±10%, 20 VA
47-63 Hz

**Fusible exterior**
0.2A, 250 VCA, Temporizado
(T200mA, 250V)

**Aislamiento**
2300 VCA

**Alimentación CC (8770-X)**

**Potencia de entrada**
9-30 VCC, 12 VA
Protección voltaje inversa

**Fusible exterior**
2.0A, 50 VCC, Temporizado
(T2A, 50V)

**Aislamiento**
2300 VCA para señalar entradas y relés, 500 VCA para RS485 y salidas analógicas

**Salida de potencia CC**

12V CC ± 12% 75mA max
Protección cortocircuito

**Cuadro opcional relé (877X-1, 877X-3, 877X-5, 877X-7)**

**Relés**
2 SPCO

**Contactos**
5A, 250V CA o 30V CC

**Aislamiento**
2300V CA

**Cuadro opcional salida analógica (877X-2, 877X-3, 877X-6, 877X-7)**

**Salidas**
4-20mA CC (<750Ω carga),
0-10V CC (>2500Ω carga)

**Precisión**
± 0.13% escala industrial
100ppm/°C
**+** 0.07% conmutador escala industrial 4 - 20mA extensión carga

**Aislamiento**
2300V CA para señalar entradas, relés y alimentación CA, 500V CA para RS485 y alimentación CC

---> *página 17*

## Specifiche

**Alimentazione CA (8771-X)**

**Potenza di entrata**
94-240 VCA, ±10%, 20 VA
47-63 Hz

**Fusibile Esterno**
0.2A, 250 VCA, Ritardato
(T200mA, 250V)

**Isolamento**
2300 VCA

**Alimentazione CC (8770-X)**

**Potenza di entrata**
9-30 VCC, 12 VA
Protezione di tensione inversa

**Fusibile Esterno**
2.0A, 50 VCC, Ritardato
(T2A, 50V)

**Isolamento**
2300 VCA alle ingressi di segnale e ai relè, 500 VCA a RS485 e alle uscite analogiche

**Uscita di Potenza**

12V CC ± 12% 75mA max
Protezione di cortocircuito

**Scheda opzionale relè (877X-1, 877X-3, 877X-5, 877X-7)**

**Relè**
2 SPCO

**Contatti**
5A, 250V CA o 30V CC

**Isolamento**
2300V CA

**Scheda opzionale Uscita Analogica (877X-2, 877X-3, 877X-6, 877X-7)**

**Uscite**
4-20mA CC (<750Ω carico),
0-10V CC (>2500Ω carico)

**Accuratezza**
± 0.13% su fondo scala
100ppm/°C
**+** 0.07% di risoluzione su 4-20mA di campo

**Isolamento**
2300V CA ingressi di segnale, relè e alimentazione AC, 500V CA RS485 e alimentazione CC

---> *pagina 17*

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## RS485 option board (877X-4, 877X-5, 877X-6, 877X-7)

**Protocol**
Opto 22® compatible
**Isolation**
2300V AC to signal inputs, relays and AC power supply, 500V AC to analog outputs and DC power supply

## Display (all models)

5 digit red LED
14mm high characters
**Update Time**
0.1 - 99.9 seconds minimum

## Memory (all models)

EEPROM, 100 years

## Environmental (all models)

**Operating Environment**
Indoor use to 2000m
**Operating Temperature**
0°C to +50°C
**Storage Temperature**
-20°C to +70°C
**Relative Humidity**
0 to 85%, non-condensing
**Sealing**
Front panel sealed to IP65 when used with clip mount and gasket provided.
**Installation Category (IEC 664)**
Overvoltage category II
Pollution degree 2
**Vibration**
2.5 g's, 30 to 200 Hz
**Shock**
30 g's, 11 msec half sinewave
**EMC**
Heavy Industrial:
Immunity to EN 50082-2
Emissions to EN 50081-2



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## RS485 Optionskarte (877X-4, 877X-5, 877X-6, 877X-7)

**Protokoll**
Opto 22® kompatibel
**Isolierung**
2300V AC an Signaleingänge und Relais und Versorgung AC, 500V AC an Analagausgänge und Versorgung DC

## Display (alle Modelle)

LED ± 5 stellig, rote Zeichenhöhe 14mm
**Update-Zeit**
0.1 - 99.9 Sekunden minimum

## Speicher (alle Modelle)

EEPROM, 100 Jahre

## Umgebung (alle Modelle)

**Operating Environment**
Einsatz in Innenbereich, bis 2.000 m
**Betriebstemperatur**
0°C bis +50°C
**Lagertemperatur**
-20°C bis +70°C
**Relative Luftfeuchtigkeit**
0 to 85%, nicht kondensierend
**Dichtung**
Frontblende bei Verwendung von mitgelieferter Befestigungsklammer und Dichtung nach IP65 abgedichtet.
**Installationskategorie (IEC 664)**
Schutzklasse II
Entstörgrad 2 (IEC64)
**Vibrationen**
2.5 g's, 30 bis 200 Hz
**Stösse**
30 g's, 11 ms halbe Sinuswelle
**EMC**
Schwerindustrie
Immunität gemäss EN 50082-2
Emissionen gemäss EN 50081-2



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## Carte RS485 en option (877X-4, 877X-5, 877X-6, 877X-7)

**Protocole**
Compatible Opto 22®
**Isolation**
2300V CA aux entrées de signal, relais et alimentation CA
500V CA aux sorties analogiques et alimentation CC

## Affichage (tous les modèles)

± 5 DEL chiffres rouges caractères 14mm
**Délai de mise à jour**
0.1 - 99.9 secondes minimum

## Mémoire (tous les modèles)

EEPROM, 100 ans

## Environnement (tous les modèles)

**Environnement de Fonctionnement**
Utilisation en intérieur jusqu'à 2000m
**Température de fonctionnement**
de 0°C à +50°C
**Température de stockage**
de -20°C à +70°C
**Humidité relative**
0 to 85%, sans condensation
**Etanchéité**
IP65 en face avant avec montage par clip et le joint d'étanchéité fourni
**Catégorie d'installation (IEC 664)**
Catégorie surtension II
niveau de pollution 2
**Vibration**
2.5 g's, 30 à 200 Hz
**Chocs**
30 g's, 11 ms demi onde sinusoïdale
**EMC**
Industrie lourde:
Immunité à EN 50082-2
Emissions à EN 50081-2

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## Cuadro opcional RS485 (877X-4, 877X-5, 877X-6, 877X-7)

**Protocolo**

compatible Opto 22®

**Aislamiento**

2300V CA para señalar entradas, relés y alimentación CA, 500V CA para salidas analógicas y alimentación CC

## Pantalla (todos los modelos)

LED rojo ± 5 dígitos caracteres de 14 mm de altura

**Hora puesta al día**

0.1 - 99.9 segundos Mínimo

## Memoria (todos los modelos)

EEPROM, 100 años

## Factor ambiental (todos los modelos)

**Medio ambiente de funcionamiento**

En el interior utilizar a 2000m

**Temperatura de operación**

0°C a +50°C

**Temperatura de almacenaje**

-20°C a +70°C

**Humedad Relativa**

0 to 85%, No condensación

**Grado de protección**

Panel frontal sellado según IP65 cuando se monta a presión con el accesorio de fijación y la junta de goma, ambos proveidos.

**Categoría de Instalación (IEC 664)**

Categoría II de sobrevoltaje grado de contaminación 2

**Vibración**

2.5 g's, 30 a 200 Hz

**Shock**

30 g's, media onda senoidal 11 ms

**EMC**

Industrial pesada:
Inmunidad en EN 50082-2
Emisiones en EN 50081-2

---> página 18

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## Scheda opzionale RS485 (877X-4, 877X-5, 877X-6, 877X-7)

**Protocollo**

Opto 22® compatibile

**Isolamento**

2300V CA alle entrate di segnale, ai relè e alle alimentazione AC, 500V CA alle uscite analogiche e all'alimentazione CC

## Display (tutti i modelli)

± 5 cifre con LED rosso caratteri da 14mm

**Tempo di aggiornamento**

0.1 - 99.9 secondi minimo

## Memoria (tutti i modelli)

EEPROM, 100 anni

## Ambientale (tutti i modelli)

**Ambiente Operativo**

Per uso inferiore a 2000m slm

**Temperatura di funzionamento**

da 0 a +50°C

**Temperatura di immagazzinamento**

da -20 a +70°C

**Umidità Relativa**

da 0 a 85%, senza condensa

**Tenuta**

Pannello frontale con tenuta IP65 con fissaggio e guarnizione in dotazione.

**Categoria di installazione (IEC 664)**

Categoria di sovratensione II
Grado di inquinamento 2

**Vibrazione**

2.5 g, da 30 a 200 Hz

**Urto**

30 g, 11 ms metà sinusoide

**CEM**

Industriale Pesante:
Immunità in base a EN 50082-2
Emissioni in base a EN 50081-2

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## Inputs, Eingänge, Entrées, Entradas, Ingressi

| | **Sink**<br>**Capteur**<br>**De Carga**<br>**Pozzetto**<br>**(NPN)** | **Source**<br>**Generador**<br>**Generatore**<br>**(PNP)** | **Magnetic Pickup**<br>**Magnetsensor**<br>**Détecteur magnétique**<br>**Fonocaptor magnético**<br>**Sensore magnetico** |
|---|---|---|---|
| **Impedance**<br>**Impedanz**<br>**Impédance**<br>**Impedancia,**<br>**Impedenza** | 4.75 KΩ - 5V | 34.9 KΩ - 0V | 34.9 KΩ - 0V |
| **Frequency**<br>**Frequenz**<br>**Fréquence**<br>**Frecuencia**<br>**Frequenza** | 200 Hz / 10 kHz * | 200 Hz / 10 kHz * | 200 Hz / 10kHz * |
| | 3.5 - 28V<br>0 - 1.9V  | 3.5 - 28V<br>0 - 1.9V  | 200mV -<br>65V RMS  |

*

user selectable
Vom Benutzer wählbar
Sélection utilisateur
seleccionable por el usuario
selezionabile dall'utente

| **Program enable, Aktivierung der Programmierung, validation du Programme, Habilita el programa, Attivazione programmazione** |
| --- |
| 4.75 KΩ - 5V |
| |
| 3.5 - 28V<br>0 - 1.9V<br>  <br> |

# Operation

## Base Unit

The base unit measures the time between pulses generated by a process.

The display can be programmed to show either Rate or process time (Tau), by setting the Display parameter.

The display can be programmed to read in any units by setting the Display Decimal Point, Scaler and Scaler Decimal Point parameters.

The unit can be programmed to average the process time or rate over a number of pulses, by setting the Update Time parameter. The display will not update until the first pulse after the update time.

The display will reset to zero, if no pulses are received within the time set in the Zero Time parameter. This will determine the lowest rate that can be measured.

**Scaler Calculations**

NOS = Number Of Seconds in time unit (1=seconds, 60=minutes, 3600=hours etc)

PPI = Pulses Per Item (revolution, metre, litre, machine cycle etc)

DPF = Decimal Point Factor (from table below)

| *Display Decimal Point* | *DPF* |
|---|---|
| 10000 | 1 |
| 1000.0 | 10 |
| 100.00 | 100 |
| 10.000 | 1000 |
| 1.0000 | 10000 |

*for Rate:*

$$\text{Scaler} = \frac{\text{NOS} \times \text{DPF}}{\text{PPI}}$$

*for process time (Tau):*

$$\text{Scaler} = \frac{\text{PPI} \times \text{DPF}}{\text{NOS}}$$

**Note:**

*eg. Scaler = 1.2345*

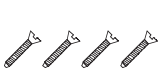
first set Scaler Decimal Point to 1.0000

*eg. Scaler = 12.345*

first set Scaler Decimal Point to 10.000

etc

**Examples:**




*1 pulse per product* *50 - 5000 products per minute updated every 10 seconds*

| | |
|---|---|
| Display | **Rate** |
| Display Decimal Point | **10000** |
| Scaler | NOS x DPF = 60 x 1 = **60** (PPI: 1) |
| Update Time | **10** seconds |
| Zero Time | Minimum rate = 50 per minute = **1.2** seconds |

---

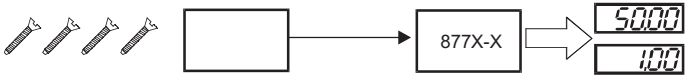

*5 pulses per metre* *100.0 - 1000.0 metres per hour updated every minute*

| | |
|---|---|
| Display | **Rate** |
| Display Decimal Point | **1000.0** |
| Scaler | NOS x DPF = 3600 x 10 = **7200** (PPI: 5) |
| Update Time | 1 minute = **60** seconds |
| Zero Time | Minimum rate = 5 x 100 pulses per hour = **7.2** seconds |

---


*70 pulses per revolution* *2.00 - 200.00 revolutions per minute updated twice per second*

| | |
|---|---|
| Display | **Rate** |
| Display Decimal Point | **100.00** |
| Scaler | NOS x DPF = 60 x 100 = **85.71** (PPI: 70) |
| Update Time | **0.5** seconds |
| Zero Time | Minimum rate = 2 x 70 pulses per minute = **0.43** second |




*1 pulse per product* *1.00 - 50.00 seconds per product*
*updated every product*

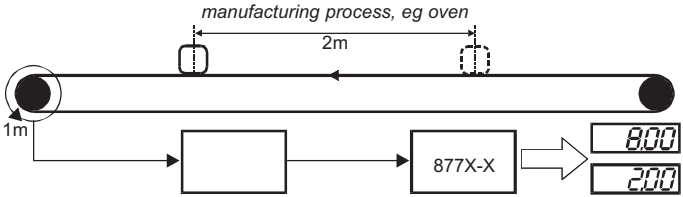
| | |
|---|---|
| Display | **Tau** |
| Display Decimal Point | **100.00** |
| Scaler | PPI x DPF / NOS = 1 x 100 / 1 = **60** |
| Update Time | Minimum time = **1**second |
| Zero Time | Maximum time = **50** seconds |

---


*50 pulses per litre* *1.000 - 9.000 minutes per litre*
*updated every minute*

| | |
|---|---|
| Display | **Tau** |
| Display Decimal Point | **10.000** |
| Scaler | PPI x DPF / NOS = 50 x 1000 / 60 = **833.3** |
| Update Time | **60** seconds |
| Zero Time | Maximum time = 9 minutes / 50 = **10.8** seconds |

---




*100 pulses per revolution* *2.00 - 8.00 minutes per product*
*(=100 pulses per metre = 200 pulses per product)* *updated twice per minute*

| | |
|---|---|
| Display | **Tau** |
| Display Decimal Point | **100.00** |
| Scaler | PPI x DPF / NOS = 200 x 100 / 60 = **333.3** |
| Update Time | **30** seconds |
| Zero Time | Maximum time = 8 minutes / 200 = **2.4** seconds |

The base unit can be fitted with one or more of these optional circuit boards: Relay, Analog Output or RS485 Serial Communication.

## Relay option board

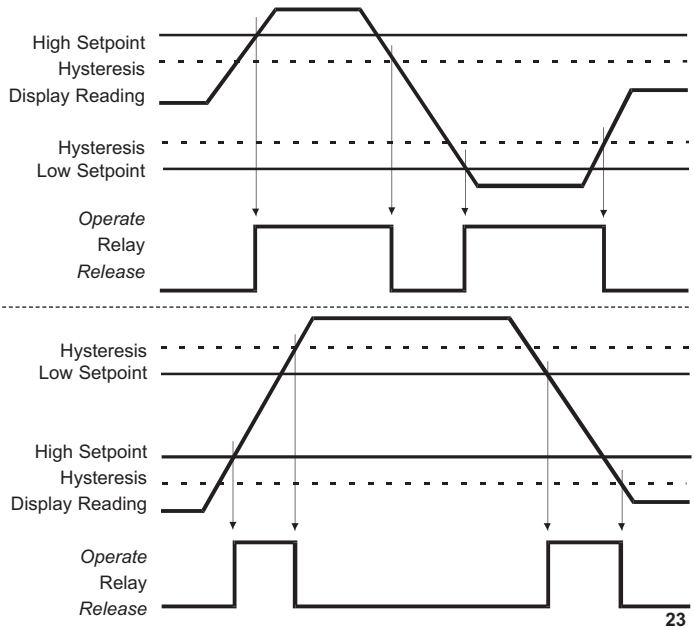
This contains two SPCO relays (see page 12).

Each relay has a programmable High Setpoint and Low Setpoint. The relay will operate when the display reads higher than the High Setpoint or lower than the Low Setpoint.

Once a relay operates, it will not release until the reading returns back across the setpoint, and then changes by a further amount. This amount can be programmed by setting the Hysteresis parameter. This is a single programmable value that is common to both relays and both setpoints.

Be careful not to overlap the hysteresis values, as the relay board will not work correctly.

**Examples:**



## Analog Output option board

This provides two analog outputs (4-20mA and 0-10V) that follow the reading on the display (see page 13).

The output can be programmed to any range, by setting the Analog Output Offset and Analog Output Full Scale parameters.

When the display reading is equal to the Analog Output Offset value, the outputs will be 4mA and 0V.

When the display reading is equal to the Analog Output Full Scale value, the outputs will be 20mA and 10V.

When the display reading is in between these two values, the outputs will be:

$$V = \frac{(\text{Display Reading} - \text{Output Offset}) \times 10}{(\text{Output Full Scale} - \text{Output Offset})} \text{ V}$$

$$I = \left( \frac{(\text{Display Reading} - \text{Output Offset}) \times 16}{(\text{Output Full Scale} - \text{Output Offset})} \right) + 4 \text{ mA}$$

---

## RS485 option board

This provides a two-way serial communication link with a remote computer (see page 13).

The serial link can be programmed by setting the RS485 Serial Address, RS485 Baud Rate and RS485 Parity parameters.

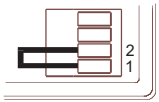
For further information about the serial communication protocol, contact your local Trumeter office.

## Programming

**Caution:** If the optional relay output and/or analog output board(s) are installed in the DPM, then entering Program mode will cause both relays to release and the analog output to go to its minimum value (0V or 4 mA) regardless of the input signal value.

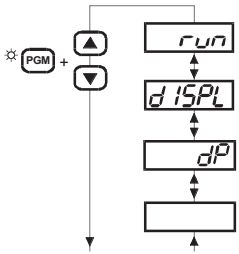
To program the base unit and the option boards, follow the instructions below.

**1**




Connect *Program Enable* to 0V.

**2**



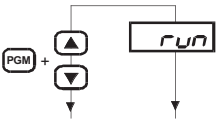

Use the PGM, ▲ and ▼ buttons to select a parameter from the parameter list (see page 26).
The PGM lamp will light.
Release the buttons to see the parameter value.
Press PGM to see the parameter name.

**Note:** The parameters for each option board will only appear if that option board is installed.

**3**

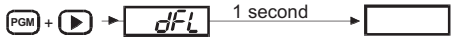

Use the ▶, ▲ and ▼ buttons to edit the parameter, as shown on page 29.

**4**

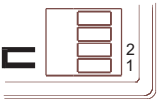



Set the display back to run to try out the new settings.
Go back to 2 to change other parameters.

**Note:** To set all parameters to their default values:

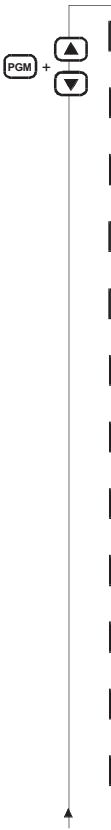



**5**

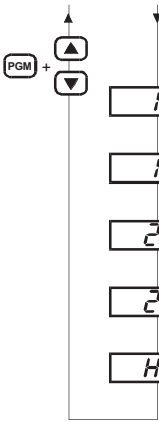



Disconnect *Program Enable*.

## The Parameter List




| Display | Default value | Parameter |
|---|---|---|
| run | | Run<br>Normal operation |
| dISPL | rAtE | Display (all models)<br>*Rate Tau (process time)* |
| dP | 10000 | Display Decimal Point (all models)<br>decimal point position for display<br>*10000 1.0000 10.000 100.00 1000.0* |
| SCLdP | 1.0000 | Scaler Decimal Point (all models)<br>decimal point position for Scaler, below:<br>*1.000 10.00 100.0 1000* |
| SCALE | 1.0000 | Scaler (all models)<br>see calculations on pages 21 and 22:<br>*0.001 to 9999* |
| UPdAt | 01.0 | Update Time (all models)<br>minimum time between updates:<br>*0.1 to 99.9* |
| 2Er0 | 01.0 | Zero Time (all models)<br>maximum time before display goes to zero:<br>*0.1 to 99.9* |
| Add | 00 | RS485 Serial Address<br>*00 to 99* |
| br | 1.20 | RS485 Baud Rate<br>*1200 2400 4800 9600 19200* |
| PAr | no | RS485 Parity<br>*none even odd* |
| oOF | 00000 | Analog Output Offset<br>display reading to give zero analog output:<br>*0 to 99999* |
| oFS | 99999 | Analog Output Full Scale<br>display reading to give full scale analog output:<br>*0 to 99999* |




| Default value | Parameter |
|---|---|
| 99999 | Relay 1 High Setpoint<br>Relay will operate above this display reading:<br>*0 to 99999* |
| 00000 | Relay 1 Low Setpoint<br>Relay will operate below this display reading:<br>*0 to 99999* |
| 99999 | Relay 2 High Setpoint<br>Relay will operate above this display reading:<br>*0 to 99999* |
| 00000 | Relay 2 Low Setpoint<br>Relay will operate below this display reading:<br>*0 to 99999* |
| 000 | Hysteresis<br>(see *Relay option board*)<br>*0 to 999* |


dISPL


dP


SCLdP


SCALE


UPdAt


2Er0


Add


br


PAr


oOF


oFS


1H i


1Lo

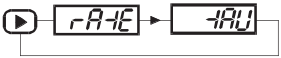

2H i


2Lo


HYS

## Editing the Parameters

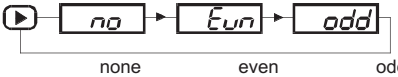
Display



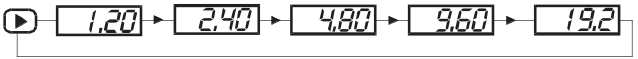

Display Decimal Point


Scaler Decimal Point

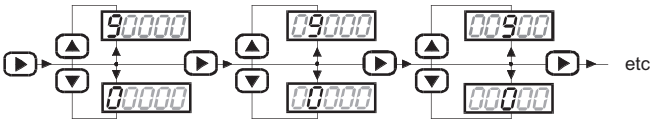

RS485 Parity




RS485 Baud Rate




All other numeric settings



## Diagnostics

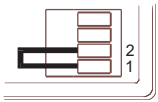
**Caution:** Performing the diagnostic tests will turn on the analog output and operate the relays if those options are installed. First remove power from the DPM and disconnect the outputs from any loads that should not be turned on. If the optional RS485 communication board is installed, the DPM will respond with the scaled input value to the QST command.

**Tests performed automatically when power is turned on:**

| | | |
|---|---|---|
|  | Display test | if faulty, return to factory for repair |
|  | Memory error | } return to factory for repair |
|  | Calibration error | } |
|  | Programming error | press any key or cycle power OFF then ON then re-program |

**Keyboard diagnostics:**

**1**




Turn Power OFF

Connect *Program Enable* to 0V.

---

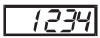
**2** ▶ + ▲ +

Turn Power ON

| | |
|---|---|
| Display test | All segments and PGM light ON<br>Relays released<br>Outputs minimum (0V or 4mA) |

---

**3** PGM →



Software part number

▶ →

| | |
|---|---|
| Analog Test | Outputs maximum (10V or 20mA)<br>Display blank |

▲ →

| | |
|---|---|
| Relay 2 Test | Relay 2 operates |
| Digit Test | One digit at a time |

▼ →

| | |
|---|---|
| Relay 1 Test | Relay 1 operates |
| Segment Test | One segment at a time |

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**4**


Turn Power OFF

Disconnect *Program Enable*.

Trumeter Technologies Ltd., Imperial House, Hornby Street, Bury
BL9 5BN, United Kingdom
Tel: +44 (0)161 705 4318  Fax: +44 (0)161 705 4319
e-mail: sales.uk@trumeter.com

Trumeter Company Inc.,1020 North West 6 Street, Suite D,
Deerfield Beach, Florida 33442, U.S.A.
Tel: +1 800 537 2261 Fax: +1 954 449 0947
email:  sales.usa@trumeter.com

http://www.trumeter.com