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C17XX

Series of Large Displays

Real Time Clock



WARNING

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User's Manual

Rev.1.0 18 July 2001

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Introduction

The C17XX is one member of a broad family of Large Displays.

This range is intended for real-time display use. Time is controlled by an internal crystal-controlled oscillator

The configuration settings of the display are stored in non-volatile battery-backed memory, which is retained for at least 3 years from date of manufacture

Change to the settings is achieved with remote contact closure inputs, allowing adjustment of hours, minutes, synchronisation of seconds, and selection of one of four brightness levels.

Display type	Quartz crystal controlled large digit display. HH:MM and HH:MM:SS formats available. Digit heights from 57mm to 280mm
Adjustment signal inputs	3 external contact closures, for example pushbuttons Normally open format 5V DC open circuit voltage 1mA closed circuit current
Data output format to slave	RS422 1200 baud; 1 start bit, 8 data and 1 or more stop bits.
Handshake	No handshake, unit always transmits data.

Unpacking and Inspection

PLEASE check the carton's contents as soon as possible after receipt, to detect any transit damage or losses. Unpack the contents and check each item in the box against the check list below to make sure you have all items.

Check List :

- Handbook
- Display
- Mounting kit (where appropriate)
- Programming Unit (If Ordered)

In the event of damage, please contact the carrier and advise our sales office of the fault.

Please retain the carton packing material, for future possible use.

General Information

The 1700 series is a family of units for broadcasting process values and data on easy to read large 7 segment displays. Character heights of 2", 4", 6", 8" or 11" are standard, and, dependent on type, displays are 4,5,6 or 7 digit. Extra-large and Daylight viewing displays are available to special order.

The enclosures for the displays are of welded UPVC material with tough lenses, providing certified protection to IP65 for the internal electronics.

The units incorporate a 95 to 265VAC power supply (Which can be used on DC in the range 100 to 300 VDC) for operation off any mains source without the need to re-configure.

Display brightness is settable to 4 levels to accommodate differing ambient light conditions and the 3 standard character heights provide a choice of viewing distances of up to 20, 40 and 60 metres. Other character heights and brightnesses are available to special order.

The large displays are based around a common power and control card which is linked to display units of different sizes.

Instrument behaviour is set by way of remote contact closure pushbuttons, which provide access to and alteration of the instrument's menu, and the settings are stored in 3 year non-volatile memory.

Specifications

Display type: Quartz crystal controlled clock
Signal Input 3 pushbutton contact closures
Data Output Type RS422 ,ASCII format, 8 data, no parity, 1 or more stop bits
Handshake None required, data is transmitted continually once per second

Case material: UPVC case, neoprene gaskets, Stainless steel fasteners
Case colour : White or Black

Case size:(mm WxH)	4 digit	6 digit
2"	288x120	384x120
4"	480x168	672x168
6"	624x192	864x192

Case depth : 90mm (115 mm including rear cable/glands)
Bezel depth : 15mm including gasket

Weight :	4 digit	6 digit
2"	2.5Kg	3Kg
4"	4.5Kg	5Kg
6"	5.0Kg	6Kg

Display type:
2" High efficiency 57mm high 7 segment display tiles
4" Ultrabright 102mm high 7 segment display tiles
6" 144mm high characters formed from twinned individual 5mm round red LEDs

Daylight viewing versions, whether 2", 4" or 6" are made up of individual 5mm round lensed LED's

Display Colour Red as standard, Green and Amber as options

Power supply 95-264VAC, 100 to 300 VDC (12, 24, 48VDC options also available)

Power consumption : 20W typically

Battery type 3V lithium, non rechargeable.
3 year lifetime

Handling precautions:

Do not touch new battery with fingers - use gloves. The natural oils on your fingers can act as a conduction path, which will

accelerate the discharge of the new battery.

Cables

The units are supplied with approximately 2 metres of free ended cable for power, setting and serial ports. A junction box external to the display may be used to connect your own cabling to that of the display. You may, however remove unwanted cable altogether, if for example a particular signal port is not required.

REMEMBER The signals you will be feeding to the displays are quite small in comparison to some of the undesirable ‘noise’ generated by certain types of common electrical machinery. To obtain the highest degree of accuracy and reliability from your indication equipment, we strongly suggest that you...

DO NOT run signal cables adjacent to power/switching lines or near equipment liable to generate large amounts of electrical noise, such as contactors, solenoids, fluorescent tubes, discharge lamps, motor control equipment, etc.

Do use screened, twisted-pair cable to minimise the amount of noise being fed into the display.

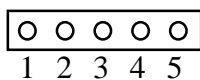


WARNING: RISK OF LETHAL ELECTRICAL SHOCK

YOU MAY NEED TO OPEN THE CASE TO ALTER JUMPER POSITIONS OR TO PANEL MOUNT THE DISPLAY. BEFORE COMMENCING TO OPEN THE CASE YOU **MUST ENSURE** THAT POWER HAS BEEN **DISCONNECTED**, AND MUST ENSURE THAT POWER CAN IN NO CIRCUMSTANCES BE RE-APPLIED TO THE DEVICE WHILST THE CASE IS OPEN.

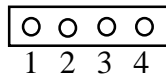
Signal & Setting Cables

The signal and data connectors are at the left hand end of the power and control card. They are connected to extension cables, which are accessible from the rear of the display. Use a junction box to extend these cables, or substitute your own cabling, which must be shielded.



Remote Programmer

1=Screen	Braid
2=Common	Red
3=MINUTES	Green
4=HOURS	Blue
5=BRIGHTNESS	Yellow

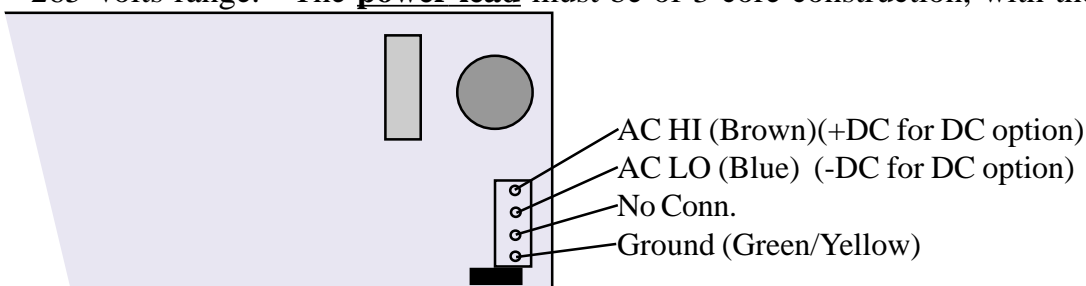


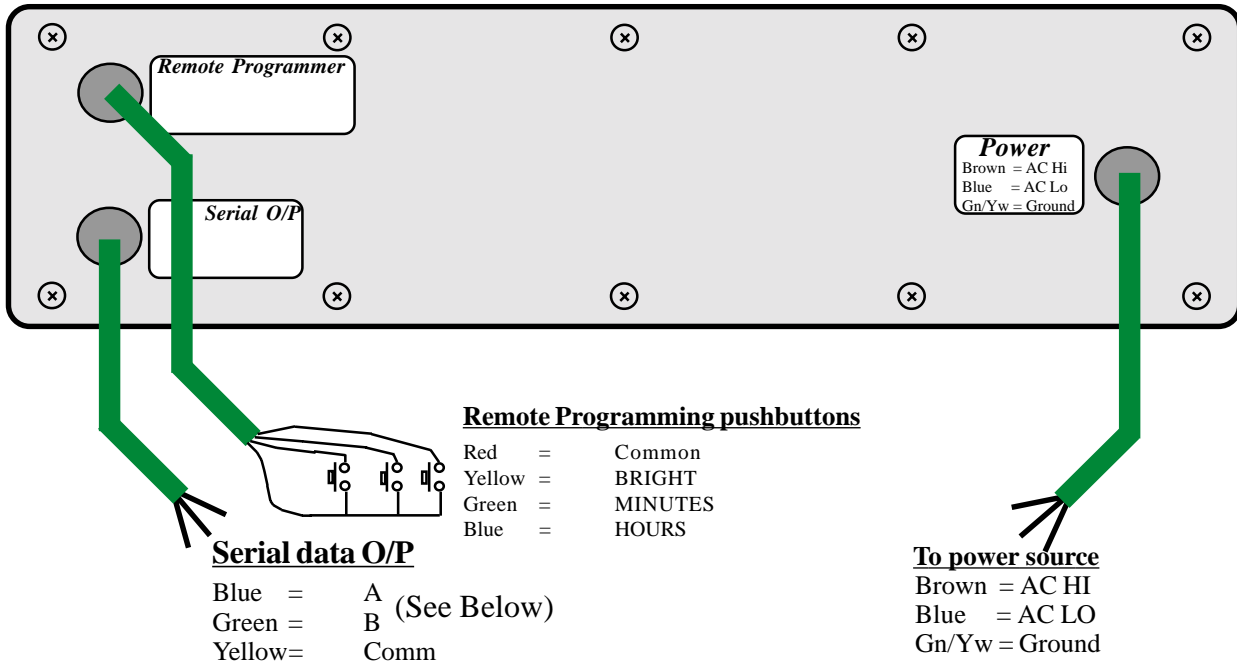
Serial Data O/P

1=Screen	Braid
2=Common	Yellow
3=Data B	Green
4=Data A	Blue

Power Cable

The unit incorporates a switching power supply to enable the unit to operate over the full 95 to 265 Volts range. The **power lead** must be of 3 core construction, with the ground wire

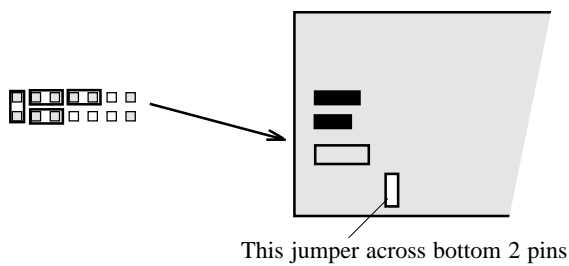




RS422 Output jumper selection

This display offers RS422 data output, which requires some of the internal jumper switches to be set as shown below.

ENSURE POWER HAS BEEN SWITCHED OFF BEFORE OPENING THE CASE !



4.3 CONTACT CLOSURE CONNECTIONS

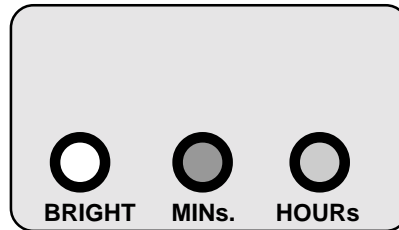
Contact closure programming input:

Function	Supplied wire colour
<i>Minutes</i>	<i>Green</i>
<i>Hours</i>	<i>Blue</i>
<i>Brightness</i>	<i>Yellow</i>
<i>Common</i>	<i>Red</i>

Setting the Time and Brightness

The C17XX is adjusted by using three contact closure programming pushbuttons.

If you make up your own programmer, please be sure to use good quality pushswitches. Avoid simply tapping the bare ends of the programmer cable together in place of fitting switches, you will find it difficult to make clean, determined contact, with the result that you will probably accidentally skip past desired setting times.



Each press increments the minutes by 1, only when the BRIGHT button is held down.

Seconds are reset to zero, so you should synchronise the setting of the minutes to coincide with the next minute value and 00 seconds

You will need to reset your brightness setting afterwards.



Each press increments the hours by 1, only when the BRIGHT button is held down. You will need to reset your brightness setting afterwards.



Press to change brightness. 4 levels available. Brightness value is stored in the display's memory.

Installation

If possible position the display away from heat and direct sunlight on the display face. The displays should not be exposed to substances liable to damage uPVC, acrylic or glass.

If mounted outside, the display should be protected by a shroud to limit direct falls of rain, the cooling effect of which can give rise to the display sucking in moisture.

REMEMBER The signals you will be feeding to the displays are quite small in comparison to some of the undesirable 'noise' generated by certain types of common electrical equipment. To obtain the highest degree of accuracy and reliability from your indication equipment, we strongly suggest that you....

DO NOT run signal cables adjacent to power/switching lines or near equipment liable to generate large amounts of electrical noise, such as contactors, solenoids, fluorescent tubes, discharge lamps, motor control equipment, etc.

DO use shielded, twisted-pair signal cable to minimise the amount of noise being fed into the display.

Mounting Positions

The unit as supplied is suitable for panel mounting, or may be free standing. Optional mounting kits provide for wall mounting, suspension mounting and vertical or horizontal links for multiple units.

Panel Mounting

The panel cutout sizes in mm +/- 1mm are as follows .. (width x height):

	5 digit	7 digit
Digit Height		
2"	279x111	375x111
4"	471x159	643x159
6"	615x183	855x183

Method :

Remove fixing screws and slacken the cable glands. Ease rear case off front section, leaving rubber gasket on front section.

Offer front section up to panel cutout.

Feed cables through glands in case rear. Slide rear over front section, pulling any excess cable through glands. Fit all screws and washers, and finger-tighten glands.

Wall Mounting

Fixing centres (mm, horizontal) Hole pitch 100mm vertical

	4 digit	6 digit
2"	288	384
4"	480	672
6"	624	864

Method : Fix the wall mounting brackets to the wall with rawlplugs and screws or nuts
and +bolts.

Offer the case up to the brackets and insert the screws and washers supplied at each end of the case. Note the position of the friction washers. Tighten the mounting screws sufficiently to hold the display in position. Do not over-tighten.

Suspension Mounting

Connect the U shaped bracket with the supplied screws and washers to each end of the display. Tighten the screws sufficiently to hold the display in place. Do not over-tighten.

Drill an 8.5mm diameter hole in the beam where the display is to be fitted. Slide the supplied bolt through the bush. Feed this through the center hole of the suspension bracket and place the bearing washer on top. Push the bolt through the drilled hole and secure with the nut and washers supplied. Please note that the drilled hole should be sufficiently clear from any obstruction to allow the display to swing 360 degrees and pivot up and down.

Clearance diameter and height (mm)

Digit height	4 digit	6 digit
2" (57mm)	325x150	425x150
4" (102mm)	525x200	715x200
6" (144mm)	670x225	910x225

Trouble shooting and maintenance

The Large displays have been designed to provide a long trouble-free life.

The front lens may be cleaned with a proprietary window cleaner, and the case may be hosed down, and cleaned with a cloth dampened with mild detergent. Surface scratching can be polished out with a mildly abrasive cleaner such as perspex cleaner.

The mains power supply is for 110 or 240 volts mains, so there is no risk of applying 240 volts to a 110 volt unit. Filtering is incorporated on the mains input, to prevent damage due to short spikes on the mains.

Damage will occur if the unit is subjected to more than 265 volt power application.

There are transient absorbers on the serial ASCII data input and output, to absorb spikes on data lines. Spikes on the data input may result in the unit 'hanging up', as the spikes could be interpreted as data. Under these circumstances, the unit should be powered down and up again after a few seconds.

Check wiring prior to powering the units!

To maintain the NEMA-4 ingress protection, it is advisable to inspect the gasket set whenever the display is removed and refitted in a panel, and, if damaged or deformed, to obtain a replacement from your supplier. Please quote the full model number to ensure the correct size is obtained.

Technical helpline +44-01462-850967 Please make a note of full model number, serial number and configuration number before calling us. ***Please also read the manual before calling*** and, if you find any part unclear, or do not find the information you need, let us know. This way we can improve future editions of the manual for you.

Safety Considerations

The 1700 series are protected in accordance with IEC Safety Class 1. The instruments are designed and tested in accordance with IEC publication 348, 'Safety Requirements for Electronic measuring apparatus', and are supplied in a safe condition.

Whenever protection is likely to have been impaired by damage, the equipment shall be made inoperative and be secured against any intended operation.

Removal of the rear cover **WILL EXPOSE LIVE PARTS**. The equipment must be disconnected from the supply before carrying out any adjustments, replacement, or repair with the case opened. If any work is carried out with the equipment opened and powered, it shall only be carried out by a skilled person who is aware of the hazard involved.

Safety ... cont'd.

Power connections: The unit is operable as soon as the mains is applied, there is no power switch.



The equipment must be connected to a protective ground. Any interruption of the ground conductor inside or outside the equipment is likely to make the equipment dangerous.

The power and signal leads should not be allowed to collect within the instrument; all excess lead must be pulled out through the cable glands.

Note that capacitors inside the instrument may still be charged when the equipment has been disconnected from the supply. Before carrying out any work inside the equipment, a period of one minute should be allowed for capacitors to discharge; to discharge the mains filter capacitors, short together the earth, AC HI & AC LO wires.

R F I

The equipment generates and uses radio frequency energy, but when properly installed as described, complies with EN55022. The equipment is certified as meeting EN50081-1 and EN50082-1

Shielded cables **MUST** be used for all signal and data leads, and use of a 3 core power lead is required. All lead shielding braids should be bonded to a good ground.

Warranty

London warrants its products against defects in materials or workmanship for a period of two years from the date of purchase. In the event of a defect during the warranty period, the unit should be returned, freight(and all duties and taxes) prepaid by the Buyer to the authorised London distributor from where the unit was purchased. The Distributor, at its option, will repair or replace the defective unit. The unit will be returned to the Buyer with freight charges prepaid by the distributor.

LIMITATION OF WARRANTY

The foregoing warranty shall not apply to defects resulting from:

1. Improper or inadequate maintenance by the buyer.
2. Unauthorised modification or misuse.
3. Operation outside the environmental specification of the product.
4. Mishandling or abuse.

This warranty is exclusive and no other warranty, whether written or oral is expressed or implied. London specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

EXCLUSIVE REMEDIES

The remedies provided herein are the buyer's sole and exclusive remedies. In no event shall London be liable for direct, indirect, incidental or consequential damages (including loss of profits) whether based on contract, tort or any other legal theory.

NOTES

Declaration of Conformity

Declaration Number : EMC1700 Iss. 5
Issue Date : 14 July 1999
Products Covered : 1700 Series Large Displays
Title : Large Process, Load, Serial
Clock, Rate & Totalising Displays

This is to confirm that the Products covered by this declaration have been designed and manufactured to meet the following specifications :

EN55022:1987 Conducted Emissions: Class B
EN55022:1987 Radiated Emissions : Class B
IEC801-2:1984 Electro-Static Discharge Immunity: 8kV Air
IEC801-3:1984 Radiated ElectroMagnetic field Immunity: 3V/m
IEC801-4:1988 Fast Transient Immunity : AC 1kV, cable 0.5kV

Thus the products conform with the applicable sections of the following standards:

EN50081-1:1992 (normative)
EN50082-1:1992 (normative)

and comply with the requirements of Council Directive 89/336/EEC relating to Electro-Magnetic Compatibility & are designed to meet EN61010 safety directive..

To confirm compliance, representative models within the range have been independently tested and certified by MARCONI INSTRUMENTS EMC Department.

MARCONI CERTIFICATE # : TC96/029C
MARCONI CERTIFICATE Issue # : 1
MARCONI Certificate Issue Date : 14 February 1996

Conditions

The meters are permitted a worst case error of 1% of A/D range during electro-magnetic disturbance, and must recover automatically when disturbance ceases without the need for human intervention, such as resetting, power-down etc.

The meters covered by this certificate must be installed in adherence to the following conditions :-

Signal cabling shall be routed separately to power carrying cabling (includes relay output wiring)
All signal cabling shall be screened. The screen shall only be terminated to the power earth terminal

This certificate applies only to meters carrying Serial Numbers 701001 or higher.

Signed as true and correct, for and on behalf of London Electronics Ltd.
Warren Court, Chicksands, Shefford, Bedfordshire SG17 5QB

J.R. Lees
Director