T640

MODEL

Integrated Loop Processor
Product Data

EUROTHERM

CONTROLS
PROCESS AUTOMATION
RECORDERS

invensys
An Invensys company

Micro DCS	DCS in instrument format
System Integration	High speed peer-to-peer communications for integration within the Network 6000 RS422 option supporting the TCS Bisynch protocol and Modbus
Control option range	From standard control structures such as cascade and ratio, preconfigured to allow rapid low cost implementation . . . . . . to advanced control using highly flexible SFCs and function blocks
I/O options	High level process I/O — Thermocouple I/O
Plant mounting	IP65 panel mounting seal with supporting fixtures for rack and bin mounting
Features	Multi-language support Secure access to engineering settings

General description

The T640 is in itself a range of controllers. In its simplest form, M006, the controller is supplied with a suite of preconfigured, documented, single and dual loop control structures which only require parameterisation. In its most advanced form, M004, it is a multipurpose four loop controller configured for continuous control using a powerful set of function blocks supported by SFC for applications requiring sequential or state dependent control.

The block structured architecture, supported by graphical configuration tools (T500 LINtools), makes complex continuous control strategies easy to develop and maintain. Moreover, LINtools has a powerful Sequential Function Chart editor (SFC/ GRAFCET) based on IEC1131-3 standard which allows integration of sequence control with the continuous control database.

Micro DCS

The power of the T640 makes it a complete, self-contained control system. The 2.5Mbit/sec peer-to-peer communications allows groups of instruments to be interconnected without the need for any other components to co-ordinate their activity. The protocol on the peer-to-peer network and the function block architecture are shared with the other members of Network 6000 making it simple to integrate T640s into larger systems.

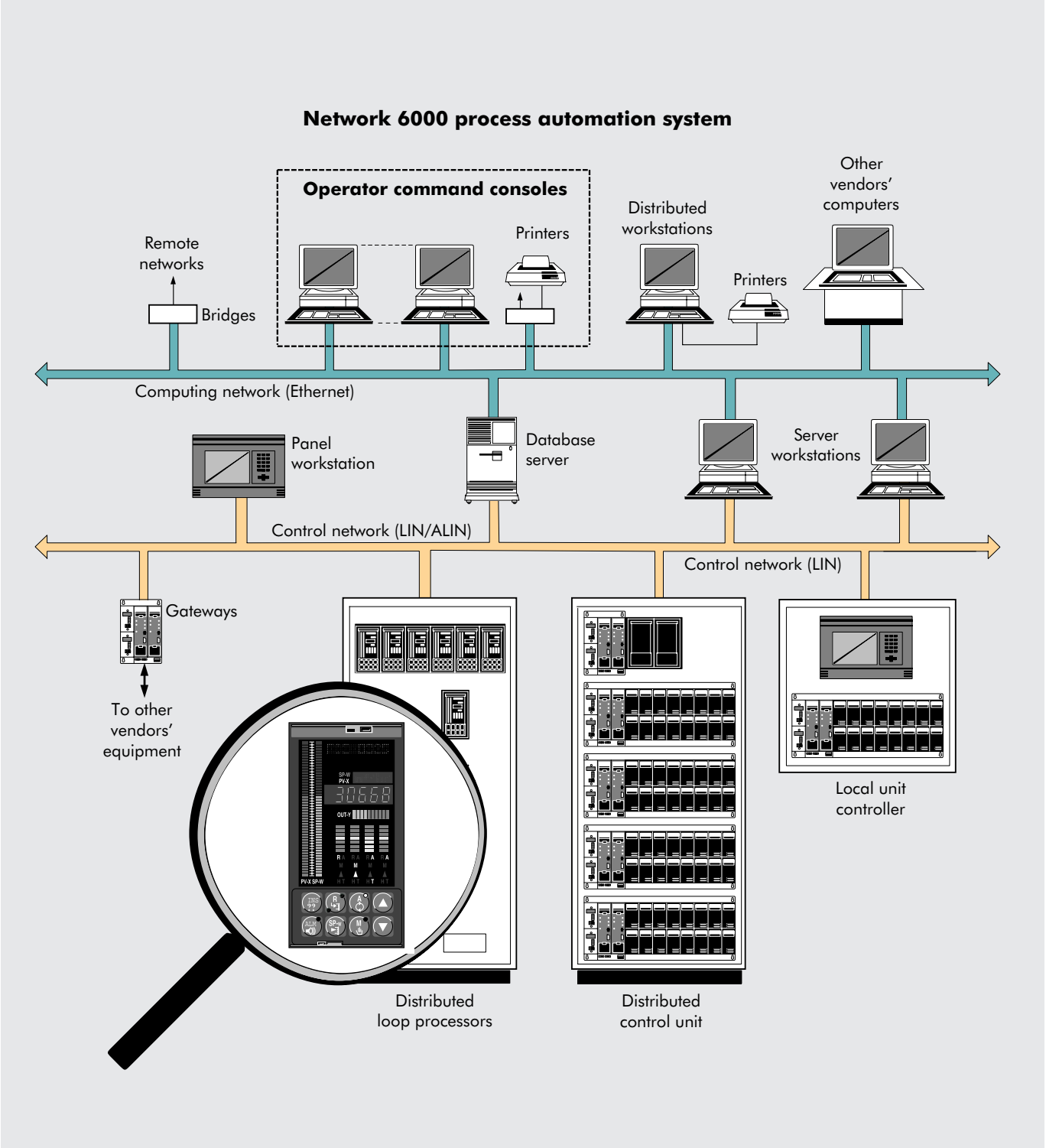
Low cost of ownership

The T640 has the DIN panel mounting format, 72 × 144 mm and is sealed to IP65. However, the instrument can be removed from the front of the panel leaving the plant wiring undisturbed.

Inside the T640 a plug-in memory module holds both control strategy and operating software, enabling their rapid transfer to a spare instrument. The same memory module holds the control options. Upgrading a T640 is merely a question of changing the module.

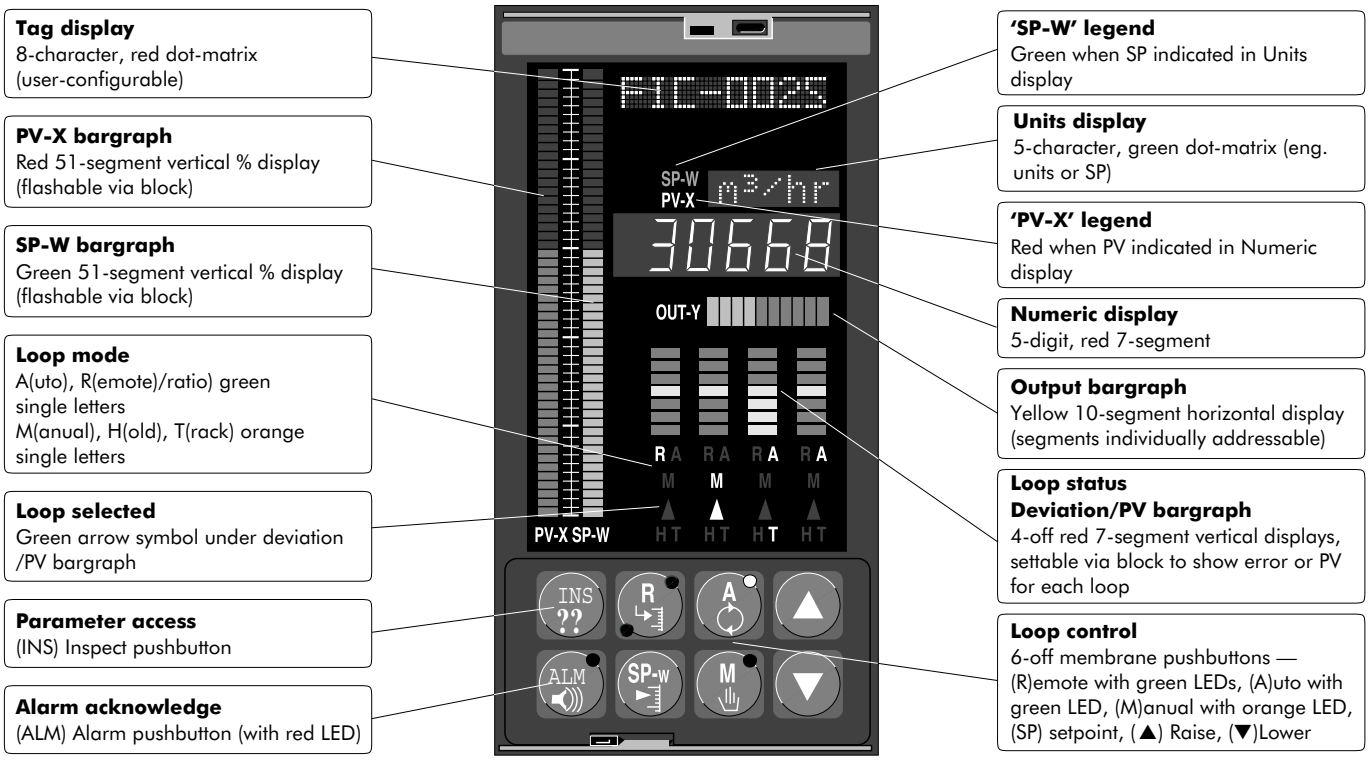
The front panel layout follows the NAMUR convention minimising the requirement for operator training. Supplementary displays can be used for loop identification or general messaging and an area on the front panel gives an overview of all the control loops.

Component kits are available that include terminating resistors for the peer-to-peer network and burden resistors for 4-20mA inputs. These rugged pre-formed components are designed to mount on the sleeve with the minimum of interference to the connectors and wiring. If the instrument is removed these components stay in place maintaining loop and communications integrity.


Network 6000 process automation system
Operator command consoles
Printers
Remote networks
Bridges
Distributed workstations
Printers
Other vendors' computers
Computing network (Ethernet)
Panel workstation
Database server
Server workstations
Control network (LIN/ALIN)
Control network (LIN)
Gateways
To other vendors' equipment
Distributed loop processors
Distributed control unit
Local unit controller

DISPLAY AND CONTROLS

The key features of the operator display are shown below.



The main display shows the setpoint, process variable and output for the selected loop. These parameters are displayed on the bargraphs. The process variable is also displayed numerically on the five-digit numeric display. The standard control buttons operate on the selected loop.

The alphanumeric displays provide additional information to clarify the display of the selected loop. For example, the five-character display may be used to show engineering units or the setpoint, and the eight-character display may be used to show loop TAG identification.

An important feature of the T640 is the loop status display. This allows the operator to see the mode of all four control loops and whether each loop is in control.

One of the functions of the eight-character Tag display is to show the presence of alarms. Alarms may be acknowledged using the ALM pushbutton.

The INS pushbutton, optionally in conjunction with the infra-red security key, allows full engineering access to all the parameters within the system. The alphanumeric displays provide messages to make this access easy. Keys are available to give two levels of access: full and partial. Additional security is available through the use of area-coded keys.

All changes made through the front panel are logged in the T640's E2PROM filing system.

Security features

The T640 has two relay outputs whose contacts are closed during normal operation. The contacts will open if the CPU watchdog trips or if power fails to the instrument. The relays have further functionality:

Watchdog relay can be set to open if a control database is not running. The relay can also be opened from the control strategy. An input in the T600 block provides this feature.

Alarm relay will open if any function has an alarm present with priority 11-15.

CONFIGURATION

Block structure

T640 supports the level of block structuring normally only found in advanced DCS systems. Each of the four control loops occupies its own task, which may be set to run at a rate appropriate to its function in the strategy. The general purpose blocks can be distributed between these tasks, T640's internal architecture ensuring data coherence.

All but the M006 Fixed-Function versions are configured by the T500 LINtools package (see Sales specification). The Fixed-Function version is set up by simple parameterisation which may be achieved either via the front panel, or using the T510 Parameterisation tool software (supplied with the controller) on a PC fitted with an ALIN interface. Parameters may also be accessed online from the T500 LINview package.

Up to 250 function blocks can be configured, depending on the size of the blocks and the number of connections. The table below lists the blocks currently supported by T640 and summarises their functions.

The ACTION block in the MATHS category is worth particular mention. Like the other function blocks this block has pre-defined I/O. However, the action of the block can be defined using Structured Text (ST, IEC1131-3). Careful use of this block can simplify otherwise complex collections of maths and logic blocks. The ACTION configurator is part of T500 LINtools.

Continuous strategy function blocks categories

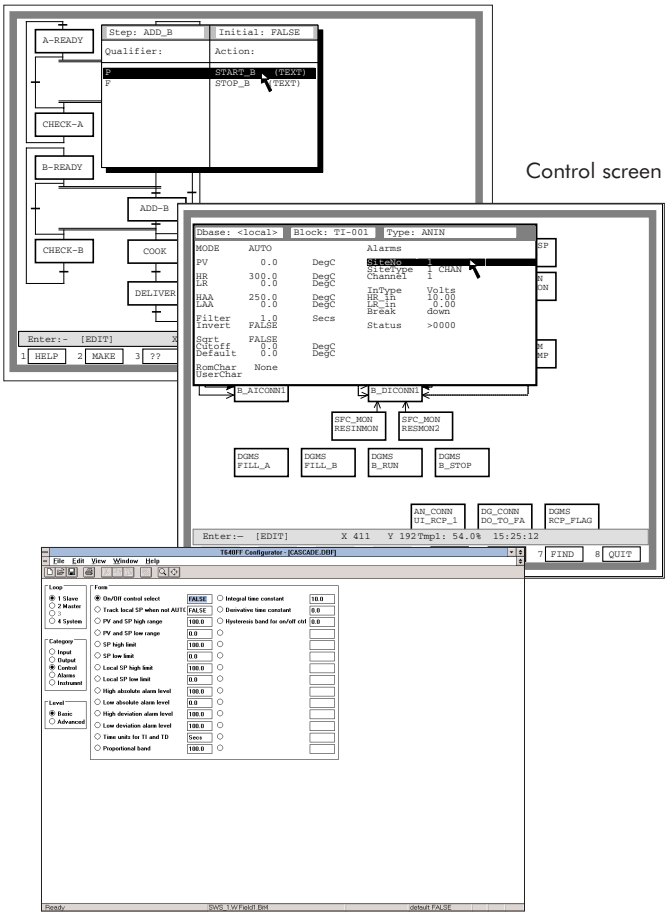
I/O	Analogue and digital input/output with manual override
S6000	Communication to panel mounted control and signal processing instruments
CONDITIONING	Dynamic signal processing and alarm collection
CONTROL	Analogue control, simulation and communications
TIMING	Timing, sequencing, totalisation and events
SELECTOR management	Selection, switching, alarm and display page
LOGIC	Boolean, latching, counting and comparison
MATHS	Mathematical functions and free format expressions
CONFIG	Unit identity blocks
DIAG	Diagnostics
BATCH	Sequencing recipe/record and discrepancy checking

SFC sequencing

This powerful programming technique, usually only found in large DCS and PLC environments, has been provided for applications of a sequential or state dependent nature. Typical uses include startup and shut down sequencing, the dynamic use of recipes, suppression of nuisance alarms in different operating modes, automatic takeover of controllers in fault tolerant configurations, etc.

Sequence screen

Control screen



Fixed-Function Parameterisation tool

Sequence control

Independent sequence tasks simultaneously loadable:	10
SFC Actions, including Root SFCs:	50
Steps:	150
Action associations:	600
Actions:	300
Transitions:	225
Sequence execution rate (reduces with increasing workload):	10Hz

LIN family of products

The function blocks, SFCs and peer-to-peer communications are common to the family of LIN products, allowing the appropriate level of distribution of functions for your application. T500 LINtools provides a powerful set of configuration and engineering tools for this family.

OPTIONS

Power supply

The T640 has two supply options — universal MAINS and DC. The DC option has a redundant input which allows two sources of supply. Information concerning the status of both inputs is available within the control strategy. Instruments with MAINS and DC options look the same. However, protection against plugging a T640 into the wrong sleeve is provided both physically, through keying in the connector, and electrically, through the use of different connector pins.

Communications

The peer-to-peer network is supplied as standard. However, a serial communication port can be supplied as an option, and can be configured for RS422 (5-wire) or RS485 (3-wire) operation. Two protocols are supported on the serial port: TCS Bisynch (Binary) for integration with TCS S6000 instruments and Modbus RTU. Selection of the protocol is made via the internal switches.

Input/Output

The T640 has two I/O sites and in principle any option can be selected for either site. There is one restriction in practice and that is a high level option Hx cannot be used in site 2 if the high level option is not selected for site 1. Details of the options currently available are given later in this document. One option is targeted at high level process plant signals (HI, HG, HIB & HGB) and the other at direct thermocouple inputs (TC).

High level (Hx)	
Chs per I/O site	**Description**
4	Analogue I/P
2	Analogue O/P (voltage)
1	Analogue O/P (current, isol)
4	Digital I/P
4	Digital O/P
1	Transmitter power supply

Thermocouple (TC)	
Chs per I/O site	**Description**
2	Thermocouple I/P (isol)
1	Analogue I/P or frequency
1	Analogue O/P (voltage)
1	Analogue O/P (current, isol)
3	Digital I/P (isol)
3	Digital O/P

Memory module

This option selects the level of functionality of the T640. Memory modules can be ordered on their own using the code T901.

M006 is the Fixed-Function T640. This will only run the preconfigured standard strategies supplied:

Single control loop
Dual control loop
Dual loop in cascade
Dual loop with ratio station

The strategies are selected using the internal switches. This is the lowest cost option but it has other advantages. The strategies have already been developed and tested, and so engineering and maintenance costs are also minimised. The I/O is pre-defined, so only the high level options may be used. This is the only restriction. Although T500 LINtools is useful, in particular the view mode, this option has been specifically designed to make this tool unnecessary. The Fixed-Function T640, M006, is provided with its own set of documentation.

The M001, M002 and M004 are provided with the preconfigured standard strategies listed below, which may be used directly or as a starting point for more complex configurations:

Two simple loops
Two cascade pairs
Two simple loops with raise/lower outputs
Two loops governed by a ratio station
Two flow loops with temperature and pressure compensated flow measurements
Two loops with heat/cool outputs
Two loops, simple or cascade, with high or low level input

The way the standard strategies are implemented allows your own configurations to be selected in place of the strategies provided.

M001 is the simplest of the configurable T640s. This supports the full range of function blocks but is limited to two control loops. This means it will run all the preconfigured strategies except 2 and 6 which use four control loops in their implementation.

M002 is the same as the M001 but supports all four control loops

M004 also supports all four control loops and it will also run SFC sequential control. From the second quarter of 1994 all T640s, whatever option, were shipped with enough memory to run SFCs and therefore upgrading is merely a question of ordering the M006 memory module. Prior to this date T640s with M001 and M002 memory modules were shipped with less onboard memory. If an M004 is fitted to one of these it will behave like an M002.

Sleeve

The T640 may be ordered with a panel mounting sleeve, T710. The T710 sleeve has no active components but has all the I/O termination. This is likely to be the most usual option.

The T750 sleeve allows the T640 to be plugged directly into a 7950 rack wired for 6000 instruments. The I/O has been chosen to match the controllers: 635x, 636x, 637x and 638x. Because these controllers were powered from 24 volts, only T640s with the DC option can function in a T750 sleeve.

The ordering structure of the T640 allows sleeves and controllers to be ordered separately. However, a sleeve is always required for a T640 to be used.

ACCESSORIES

Utility diskette

A diskette is provided with the Product Manual for the Fixed-Function T640(M006) which contains:

- The Fixed-Function Strategies in an non-encrypted form so that the configurations may be loaded into T500 LINtools for viewing the strategy at run-time. In this form the strategies will run in the M001/2/4 versions.
- The Fixed-Function Strategies in a form to run on the M006 version.
- An off-line Windows parameterisation utility which includes LINfiler. NB PCALIN or ALIN card/adapter required.
- Foreign language files and a utility to create new language files.

The diskette provided with the Product Manual for the T640 M001/2/4 contains:

- The Fixed-Function Strategies in an non-encrypted form so that the configurations may be used in the M001/2/4 versions
- The standard strategies plus further documentation.
- Foreign language files and a utility to create new language files.

Support products

Since the launch of the T640, a number of support products have been developed; more are continuing to be developed. A brief description of some these is given opposite:

T221 communications bridge used to connect the peer-to-peer communications, ALIN, from a group of T640s to the system network, LIN. The T221 operates in a transparent manner and requires no configuration, other than being given a node address. The most important function of the T221 is to segregate control and supervisory communications maintaining system bandwidth.

T750 sleeve allows the T640 to be plugged directly into a 7950 rack wired for S6000 instruments. It takes the place of the T710.

T950 infrared security key described in the text

T960 19" frame for rack mounting T640/T710s. A diagram is shown on the back page. Note there is no IP65 seal between controllers when mounted in the rack

T961 blanking plate for the T960.

T962 blanking plate for a DIN cutout. It has an IP65 seal.

LA 082728 analogue I/O termination kit with 8-off 250R burden resistors packaged in pairs and 2-off bypass diodes.

LA 082586U 002 100R terminating resistor for peer-to-peer communications using the RJ45/cat 5 screened twisted pair cable sytem. This is designed to mount on the sleeve with a minimum of interference to the connectors and wiring.

LA 082586U 001 as above but 82R for older systems
NB Terminators should match cable impedance and be fitted at both ends.

SPECIFICATION

T640 BASE UNIT

Mechanical

Fascia dimensions:	height 144mm, width 72mm.
Mounting panel aperture:	height 138 +1 –0 mm, width 68 +0.7 –0 mm.
Behind mounting panel:	depth 258mm (measured from panel front).
Front of mounting panel:	depth 10.6mm.
Weight:	2.15kg.

Environmental

CE This product conforms to EMC Directive 89/336/EEC amended by 93/68/EEC, and with European Low Voltage Directive 72/23/EEC.

Electrical safety:	EN61010-1: 1993/A2:1995
EMC emissions:	EN50081-2 industrial
EMC immunity:	EN50082-2 industrial
Storage temperature:	–10°C to +85°C, at humidity of 5-95% (non condensing)
Operating temperature:	0°C to +50°C. The enclosure must provide adequate ventilation, and heating if required to avoid condensation at low temperatures.
Atmosphere:	Unsuitable for use above 2000m or in explosive or corrosive atmospheres.
Front panel sealing:	IP65.
Isolation:	LIN and ALIN ports are double-insulated as specified in EN61010 to provide protection against electric shock.
Vibration:	BS2011 Part 2.1, Test Fc, Table CII, 'Equipment intended for large power plant and general industrial use' (2g, 10-55 Hz).
Shock:	BS2011 Part 2.1, Test Ea, Table II, 'General test for robustness, handling and transport' (15g, 11ms).

Relays

Alarm relay:	SPST. 24V ac/dc at 1A. Absolute maximum rating 30V rms, 60V dc.
Watchdog relay:	SPST. 24V ac/dc at 1A. Absolute maximum rating 30V rms, 60V dc.

Power supplies

Mains version	
Input voltage range:	90-265V ac rms.
Input frequency range:	45-65 Hz.
Maximum peak input current:	1.1A.
Power rating:	25VA.
Holdup time:	20ms.
Fuse:	20 ¥ 5 mm 250V ac antisurge cartridge, 500mA.
DC version	
Number of inputs:	2 – Ch1 (main input) Ch 2 (backup).
Input voltage range:	19-85 V (including rectified 48V ac).
Power rating:	25VA.
Holdup time:	20ms.
Fuse:	20 × 5 mm 250V ac antisurge cartridge, 2A.

SPECIFICATION (continued)

ALIN

The ALIN runs on screened twisted pair. Phase A, pin 21, should be bussed to other Phase A signals and likewise Phase B, pin 22. The cable screen should be connected to ALIN Gnd, pin 20. The ALIN connections are galvanically isolated within the T640 to assist with noise rejection and simplify system wiring.

The key specifications of the ALIN are summarised as follows:

Cable type:	screened twisted pair.
Impedance:	100Ω*, nominal.
Network topology	single non-branching network.
Network terminations:	100Ω* at each end.
Maximum load:	16 nodes.
Maximum length:	100 metres.
Grounding:	single point ground per system.

* 82Ω used on older installations; the T640 supports either cable standard.

HIGH LEVEL I/O

The specification given below is for a single I/O site. The T640 supports two I/O sites. For implementation reasons the electronics for both sites is on a single board. The I/O connections for the second site are brought out through a simple interconnection board. For this reason, the high level option cannot be chosen for site 2 if it has not been chosen for site 1.

Analogue inputs

Channels:	4.
Input range:	0-5V and 0-10V, with software selectable range. 0-1.25V range jumper-selectable.
Resolution:	0.025%.
Accuracy:	0.05% of range.
Gain drift:	30ppm/°C.
Offset drift:	65μV/°C.
Input impedance:	1 MΩ pull-down to –1.2V.
Break detection:	within 1 sample. Protection strategy selected from within the configuration (up-scale, down-scale, etc.).
Isolation:	none.
Sample rate:	9ms per configured input. Only the configured inputs are scanned. The fastest loop update cannot be less than 20ms.

Internal burden resistors

Values:	HIB option — 250Ω HGB option — 62Ω.
Power:	0.25W.
Tolerance:	0.1%.
Temperature coefficient:	15ppm/°C.

Note.
Tolerances and temperature coefficients must be added to the specified analogue input tolerances.

Transmitter power supplies

Channels:	1.
Voltage:	24V ±5%.
Current:	0-22mA.
Current limit:	30mA maximum.
Isolation:	60V working.

Voltage analogue outputs

Channels:	2.
Output range:	0-5V and 0-10V, with software-selectable range. 0-1.25V range jumper-selectable
Resolution:	12 bits (1.25 and 2.5mV, for the 5 and 10V ranges resp.).
Accuracy:	0.05% of range.
Gain drift:	30ppm/°C.
Offset drift:	70μV/°C.
Current drive:	±5mA.
Overload detection:	triggered if the output cannot maintain the desired voltage.
Isolation:	none.

Current analogue outputs

Channels:	1.
Output range:	0-20mA. (Rangeable 0-10mA, 0-20mA, 4-20mA etc.).
Over-range:	22mA.
Resolution:	5μA.
Accuracy:	0.1%.
Gain drift:	80ppm/°C.
Offset drift:	0.9μA/°C.
Output drive:	0-1kΩ.
Isolation:	60V working.

Digital inputs

Channels:	4.
Thresholds:	logic 1: 7.5V minimum logic 0: 2.5V maximum.
Hysteresis:	1.0V minimum, 3.5V maximum.
Input voltage:	28V maximum.
Input impedance:	200kΩ for inputs <10V, 100kΩ for inputs >10V.

Digital outputs

Channels:	4.
Output levels:	logic 0: 0V logic 1: 15V (14.0V-15.5V internal supply, or external supply).
External supply:	15.5V minimum, 28V maximum.
Drive impedance:	logic 0: 68Ω, 25mA maximum sink current logic 1: 2.2kΩ.

SPECIFICATION (continued)

THERMOCOUPLE I/O

The specification given below is for a single I/O site. The T640 supports two I/O sites.

mV/Thermocouple inputs

Channels:	2
Resolution:	>14 bits
Accuracy @ 25°C:	0.1% of mV range
Temperature drift:	less than ± (0.7μV + 0.008% of reading)/°C @ 99% confid. (less than ± 0.3μV + 0.003% of reading)/°C typically)
Input Isolation:	250V ac rms
Break detection:	within 1 sample period (with options to go high-scale, low-scale or retain last good value).
50/60Hz rejection:	60dB SMR, 120dB CMR (software-selectable between 50Hz and 60Hz)

Low level (mV) input mode

Input ranges:	–14.2 to 77mV, -7.1 to 38.5mV-3.5 to 19.2mV and -1.8 to 9.6mV (software-selectable)

Thermocouple input mode

Input ranges:	J	–210 to 1200°C	K	–270 to 1372°C
	T	–270 to 400°C	S	–50 to 1767°C
	R	–50 to 1767°C	E	–270 to 1000°C
	B	0 to 1820°C	N	0 to 1300°C
	W	1000 to 2300°C	W3	0 to 2490°C
	W5	0 to 2320°C	MoRe	0 to 1990°C
CJC accuracy @ 25°C:	–0.25°C to +1.1°C			
CJC ambient rejection:	30:1 typically			

Analogue input

Channels:	1, non-isolated (software-selectable between voltage and frequency input modes).

Voltage input mode

Input ranges:	0 to 10V, 0 to 2.5V (software-selectable)
Out of range capability:	± 10%
Accuracy @ 25°C:	0.1% of scale
Resolution:	>14 bits over 0-10V, 0-5V and 1-5V rangings
Temperature drift:	less than ± (100μV + 0.008% of reading)/°C @ 99% confid. (less than ± 40μV + 0.004% of reading)/°C typically)
Break detection:	within 1 sample period (with options to go high scale, low scale or retain last good value)

Frequency input mode

Input ranges:	0.01Hz to 30kHz, 0.01Hz to 3kHz, 0.01Hz to 300Hz, 0.01Hz to 30Hz (software-selectable).
Over-range capability	up to 48kHz
Resolution:	>14 bits
Min. pulse length	8μs
Response time:	above 20Hz: 200ms maximum below 20Hz: waveform period + 200ms maximum
Accuracy:	0.02% of reading
Timebase accuracy:	0.05% over 5 years
Gain drift:	<1ppm/°C
Max. totalisation rate:	1kHz — with simultaneous frequencymeasurement (LoFloTot set to TRUE) 48kHz — without simultaneous frequency measurement (HiFloTot set to TRUE)

Process output

Channels:	1
Output range:	0 to 20mA can be software ranged as 0-10mA, 0-20mA, 4-20mA, etc.
Isolation:	60V ac rms
Accuracy @ 25°C:	0.1% of scale
Resolution:	12 bits (5μA)
Temperature drift:	less than ± (0.4μA + 0.008% of reading)/°C @ 99% confid (less than ± (0.2μA + 0.004% of reading)/°C typically)
Output drive capability:	0 to 1kΩ
Output fault detection:	Load fail detect (triggered if the output cannot maintain the desired current level), Over-driven detect (triggered if the output is overdriven by a larger current).
Output kill:	forces the output to low-scale current output, and to a low-impedance state (<1V drop at 20mA). (Kill activated by connecting Kill terminal to I+ terminal, reported in flag Status.Killed.

Analogue output

Channels:	1
Output range:	0 to 10V can be software ranged as 0-10V, 0-5V, 1-5V, etc
Accuracy:	0.1% of scale
Resolution:	12 bits (2.5mV)
Temperature drift:	less than ± (160μV + 0.009% of reading)/°C @ 99% confid. (less than ± (60μV + 0.004% of reading)/°C typically)
Output current drive:	+5mA (source), -0.3mA (sink)

Digital inputs

Channels:	3 (individually isolated)
Input isolation:	250V rms ac Input type: current sinking, polarised (but accepts ac)
Input voltage:	nominally 24V absolute max. ±40V
Threshold tolerance:	min. input for logic '1' 13.7V max. input for logic '0' 5.8V
Input current:	max. current for logic '0' 0.1mA min. current req. to ensure logic '1' 0.9mA max. current at 30V 4.0mA

Digital outputs

Channels:	3 (non-isolated)
Output levels:	software-selectable between: 24V internal or external pull-up (open-drain)
Internal pull-up:	21.5V to 24.6V through 3.6kΩ
External pull-up:	60V absolute maximum
Sink current:	120mA maximum, <1V drop at 40mA
Fan-in/fan-out:	Maximum of 2 isolated digital inputs can be driven from a single non-isolated digital output.

General

The environment, physical, and electrical specifications for the High-level I/O and Thermocouple I/O assembly are the same as for the base unit. The confidence limits specifications quoted above have been generated in accordance with BS4889 —appenix A

ORDERING INFORMATION

T640 Order Codes

Base unit	Power supply	Serial comms	Site 1 I/O board	Site 2 I/O board	Memory module	Sleeve	Calibration certificate	Config sheet	Labelling language	Fascia colour
T640	MAINS	—	HI	HI	M001	T710	—	—	EN	G

Example

Base unit	Code
Integrated Loop Processor	T640
Power supply	
Universal mains 90 to 265 volts ac rms	MAINS
19 to 55 volts dc power supply	DC
Serial communications	
RS422 Bi-Synch or MODBUS serial communications	422
RS485 MODBUS comms	485
(Not yet available)	ExISB
None fitted	—
Site 1 high-level I/O board	
0-5V or 0-10V input range automatically selected by database	HI
Jumpers set for 0-1.25V fixed input range	HG
As HI but with internal burden resistors fitted	HIB
As HG but with internal burden resistors fitted	HGB
Thermocouple I/O board	TC
Site 2 high-level I/O expansion board 1	
Expands board specified in Site 1,	HI
but with no burden resistors	HG
Expands board specified in Site 1,	HIB
but with internal burden resistors fitted	HGB
Thermocouple I/O board	TC
No board fitted in Site 2	—
Memory module	
2-loop Integrated Loop Processor	M001
4-loop Integrated Loop Processor	M002
As M002 plus sequencing	M004
Fixed Function	M006
As M004 plus advanced features	M007
Application specific 2	M1XX
None fitted	—
Sleeve	
Supplied in a sleeve	T710
None supplied	—
Calibration certificate	
Calibration certificate supplied	CERT
None supplied	—
Configuration sheet	
	—
Labelling language	
English	EN
French	FR
German	GE
Italian	IT
Fascia colour	
Grey-Green (default)	Green
Black (original style)	Black

Notes
1 If a high level option (HI, HG, HIB or HGB) is chosen for Site 2 the same option must be specified for Site 1.
2 Consult factory

Note: If the HIB or HGB options are selected burden resistors will be fitted to all inputs in the T640 itself. Alternatively external burden resistors can be fitted to the screw terminals (see burden resistor/diode kit below). This latter method of fitting burden resistors is preferred if the current loop is not to be broken when the instrument is removed from its sleeve.

T710 Sleeve (ordered separately)

Base unit	Power supply	Site 1 conn assy	Site 2 conn assy	Labelling language						
T710	DC	H	H	EN						

Example

Base unit	Code
DIN sleeve	T710
Power supply connector assembly	
Universal mains 90 to 265 volts ac rms	MAINS
19 to 55 volts dc power supply	DC
Site 1 connector assembly	
High-level I/O	H
Direct plant I/O	D
Site 2 connector assembly	
High-level I/O [Only if H specified in Site 1]	H
No I/O specified for Site 2	—
Direct plant I/O	D
Labelling language	
English	EN
French	FR
German	GE
Italian	IT

T750 Adapter sleeve

Base unit	Code
Adapter sleeve	T750

ORDERING INFORMATION (continued)

T901 Memory module (ordered separately)

Base unit	Controller function	Labelling language								
T901	M001	EN								

Example

Base unit	Code
Memory module	T901

Controller function	
2-loop control	M001
4-loop control	M002
4-loop control with sequencing	M004
Fixed Function	M006
As M004 plus advanced features	M007
Application specific1	M1XX

Labelling language
As T640

Notes
1 Consult factory

T950 Security key

Base unit	Access	Area	Labelling language							
T950	PARTIAL	AREA	EN							

Example

Base unit	Code
Infrared security key	T950

Access	
Full access to all parameters provided	FULL
Partial access to parameters provided	PARTIAL

Area	
Key operates only instruments with specified area code n, or zero area code. [n =1 to 8]	AREAn
Key operates only instruments with zero area code	—

Labelling language
As T640

Mounting accessories

Base unit	Code
19" × 7" Rack frame	T960
Blanking plate	T961
IP65 Blanking plate	T962
Fascia blank to fit T710/T720 sleeve (T640/T221) Black	T710B/Black
Fascia blank to fit T710/T720 sleeve (T640/T221) Green	T710B/Green

T500 LINtools

See separate Sales Specification

T510 Fixed Function parameterisation utility

Supplied with Product Manual for M006 version. Requires ALIN interface for LINfiler as follows (or PCLIN via T221 bridge):

PCALIN & ALIN card/adapter

Base unit	Code
ALIN (Arcnet) card + 3m cable	S9562
PCALIN card RJ45 with 3m cable and terminator	S9565
PCMCIA ALIN adapter for laptop with 3m cable	Consult factory

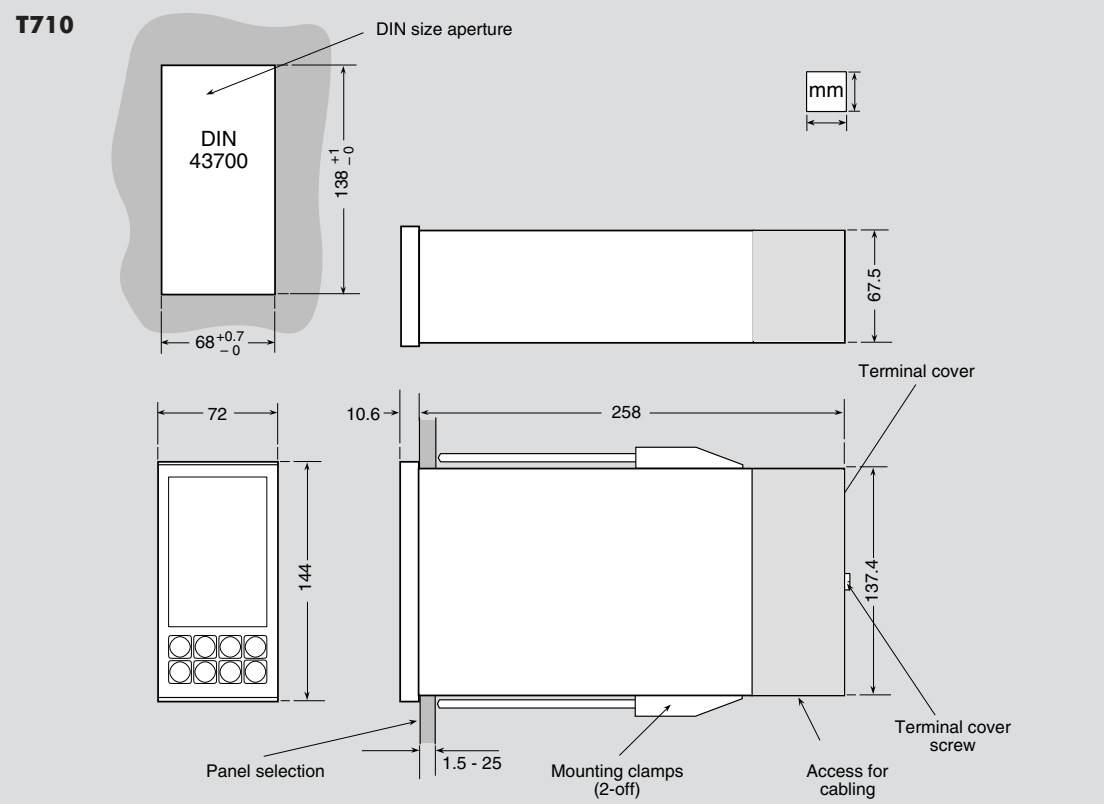
Burden resistor/diode & ALIN terminator kits

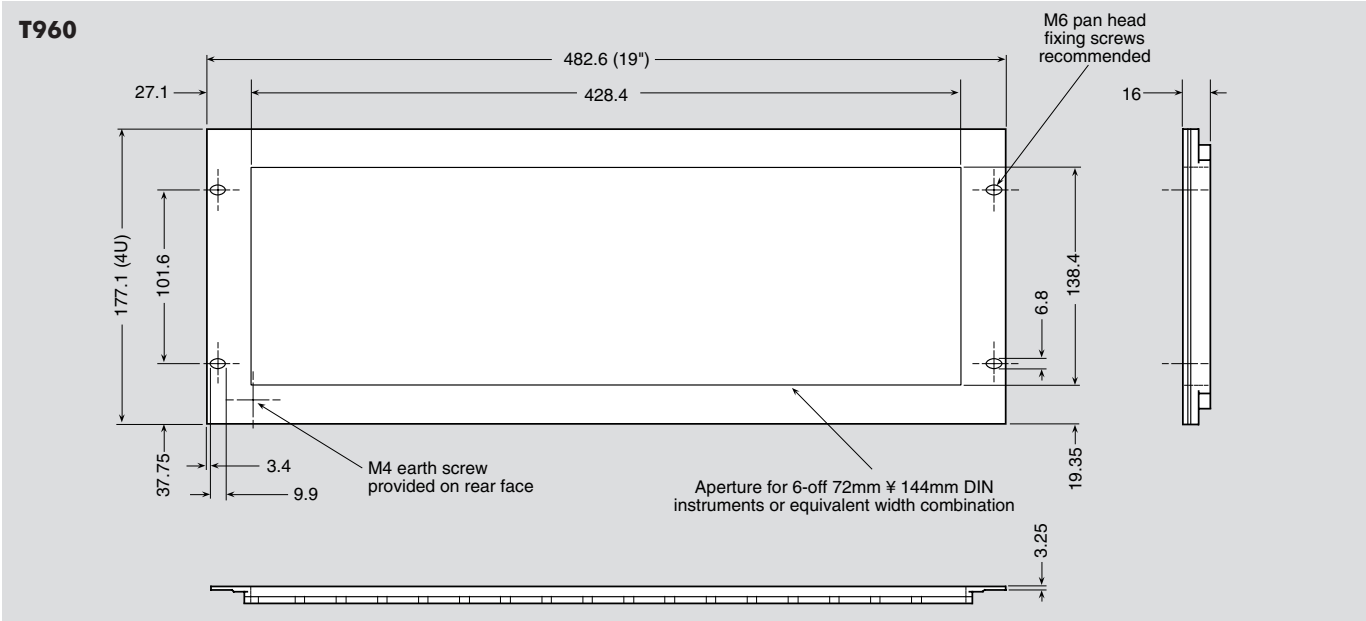
Encapsulated plug-in modules (burden resistors, burden diodes, and ALIN terminating resistors) for insertion in T640's rear-panel customer screw terminals are available using the codes listed below.

High-level mA kit	Code
4-off double 250R burden resistor plug-in modules plus 2-off burden diode plug-in modules	LA 082728

ALIN terminators	Code
100R terminating resistor plug-in modules for RJ45/Cat 5 cable system	LA 082586U002
82R terminating resistor plug-in modules for older systems (formerly supplied in pairs as LA082729)	LA 082586U001

INSTALLATION





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