

# T640

MODEL



## Integrated Loop Processor Specification Sheet

- **Micro DCS**  
DCS in instrument format
- **System Integration**  
High speed peer-to-peer communications for integration within the Network 6000  
RS422 option supporting the Bisynch (binary) 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/GRAFSET) 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 x 144 mm and is sealed to IP65. However, the instrument can be removed from the front of the panel leaving the plant wiring undisturbed.

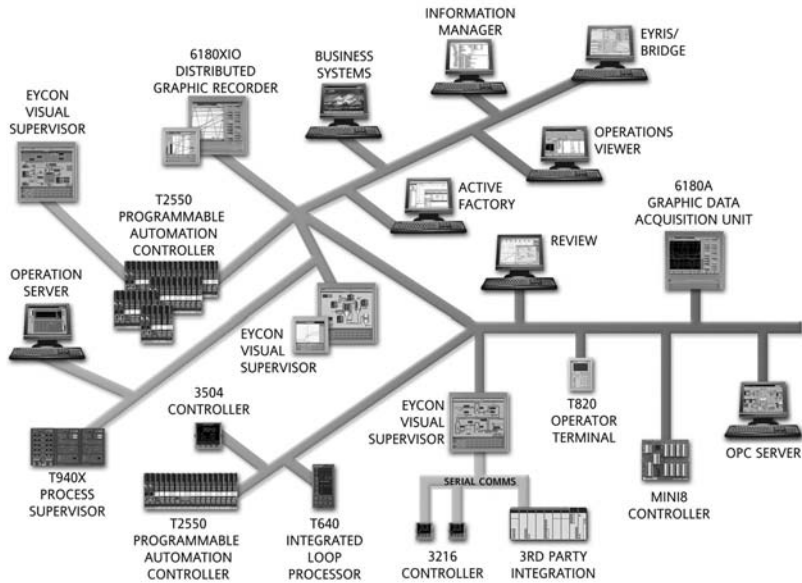
Inside the T640 a plug-in memory module holds both control strategy and operating software, enabling their rapid transfer to a spare instrument.

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



## Display and Controls

**Tag display**  
8-character, red dot-matrix (user-configurable)

**'SP-W' legend**  
Green when SP indicated in Units display

**'PV-X' legend**  
Red when PV indicated in Numeric display

**Units display**  
5-character, green dot-matrix (eng. units or SP)

**Numeric display**  
5-digit, red 7-segment

**Output bargraph**  
Yellow 10-segment horizontal display (segments individually addressable)

**Loop status**  
Deviation/PV bargraph  
4-off red 7-segment vertical displays, settable via block to show error or PV for each loop

**Loop selected**  
Green arrow symbol under deviation PV bargraph

**Loop control**  
6-off membrane pushbuttons —  
(R)emote with green LEDs  
(A)uto with green LED  
(M)annual with orange LED,  
(SP) Setpoint  
(▲) Raise  
(▼) Lower

**PV-X bargraph**  
Red 51-segment vertical % display (flashable via block)

**SP-W bargraph**  
Green 51-segment vertical % display (flashable via block)

**Loop mode**  
A(uto)  
R(emote)/ratio  
green single letters  
M(annual)  
H(old)  
T(rack)  
orange single letters

**Parameter access**  
(INS) Inspect pushbutton

**Alarm acknowledge**  
(ALM) Alarm pushbutton (with red LED)

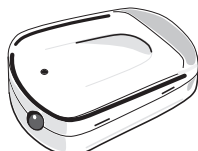
The main display shows the setpoint, process variable and output for the selected loop. These parameters are displayed on the bargraphs. The process variable is also displayed numerically on the five-digit numeric display. The standard control buttons operate on the selected loop.

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

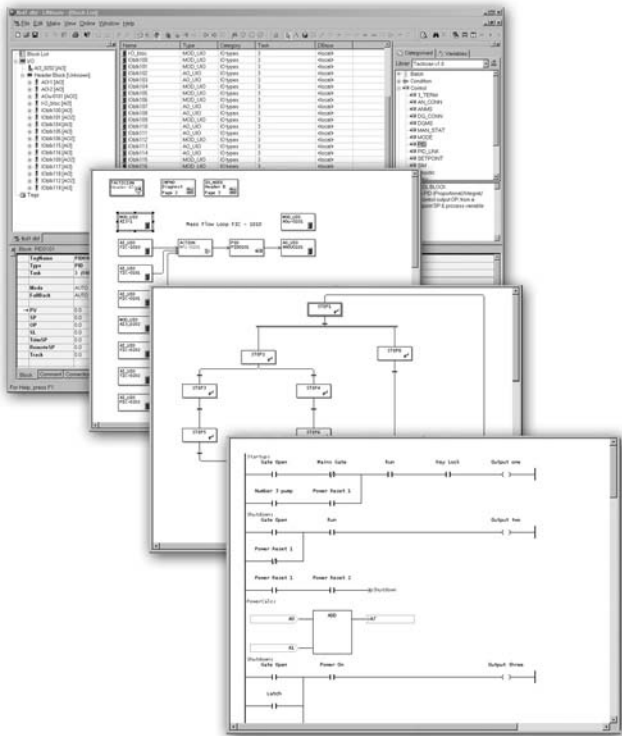
The T640 has two relay outputs whose contacts are closed during normal operation. The contacts will open if the CPU watchdog trips or if power fails to the instrument. The relays have further functionality:

**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 T555 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 T555 Parameterisation tool software (supplied with the controller) on a PC fitted with an ALIN interface. Parameters may also be accessed online from the T555 LINtools monitor 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) or ladder diagram. Careful use of this block can simplify otherwise complex collections of maths and logic blocks. The ACTION configurator is part of T555 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	Selection, switching, alarm and display page management
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 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. T555 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: Bisynch (Binary) for integration with 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 plant signals (HI, HG, HIB & HGB) and the other at direct thermocouple inputs (TC).

High level (Hx)		Thermocouple (TC)	
Chs per I/O site	Description	Chs per I/O site	Description
4	Analogue I/P	2	Thermocouple I/P (isol)
2	Analogue O/P (voltage)	1	Analogue I/P or frequency
1	Analogue O/P (current, isol)	1	Analogue O/P (voltage)
4	Digital I/P	1	Analogue O/P (current, isol)
4	Digital O/P	3	Digital I/P (isol)
1	Transmitter power supply	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 a 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/adaptor 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 a 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 below:

**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.

**LA082728** analogue I/O termination kit with 8-off 250R burden resistors packaged in pairs and 2-off bypass diodes.

**LA082586U002** 100R terminating resistor for peer-to-peer communications using the RJ45/cat 5 screened twisted pair cable system. This is designed to mount on the sleeve with a minimum of interference to the connectors and wiring.

**LA082586U001** 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

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 +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, 10-55Hz).
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 I/P current:	1.1A
Power rating:	25VA
Holdup time:	20ms
Fuse:	20 x 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 x 5 mm 250V ac antisurge cartridge, 2A

#### 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:	9ms per configured input. 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 or external supply))
External supply:	15.5V minimum, 28V maximum.
Drive impedance:	Logic 0: 68Ω, 25mA maximum sink current Logic 1: 2.2Ω

## 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 $\pm [0.7\mu\text{V} + 0.008\% \text{ of reading}]/^\circ\text{C}$ @ 99% confid (less than $\pm [0.3\mu\text{V} + 0.003\% \text{ of reading}]/^\circ\text{C}$ typically)
Input Isolation:	250V ac rms
Break detection:	Within 1 sample period (with options to go highscale, 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:	-14.2-77mV, -7.1-38.5mV-3.5-19.2mV and -1.8-9.6mV (software-selectable)
---------------	---

### Thermocouple input mode

Input ranges:	J -210-1200°C	K -270-1372°C
	T -270-400°C	S -50-1767°C
	R -50-1767°C	E -270-1000°C
	B 0-1820°C	N 0-1300°C
	W 1000-2300°C	W3 0-2490°C
	W5 0-2320°C	MoRe 0-1990°C
CJC accuracy @ 25°C:	-0.25°C+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:	0-10V, 0-2.5V (software-selectable)
Out of range capability:	$\pm 10\%$
Accuracy @ 25°C:	0.1% of scale
Resolution:	>14 bits over 0-10V, 0-5V and 1-5V rangings
Temperature drift:	Less than $\pm [100\mu\text{V} + 0.008\% \text{ of reading}]/^\circ\text{C}$ @ 99% confid. (less than $\pm [40\mu\text{V} + 0.004\% \text{ of reading}]/^\circ\text{C}$ 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:	0.01-30kHz, 0.01-3kHz, 0.01-300Hz, 0.01-30Hz (software-selectable)
Over-range capability:	Up to 48kHz
Resolution:	>14 bits
Min. pulse length:	8 $\mu\text{s}$
Response time:	Above 20Hz: 200ms maximum Below 20Hz: Waveform period + 200ms max.
Accuracy:	0.02% of reading
Timebase accuracy:	0.05% over 5 years
Gain drift:	<1ppm/°C
Max. totalisation rate:	1kHz — with simultaneous frequency measurement (LoFloTot set to TRUE) 48kHz — without simultaneous frequency measurement (HiFloTot set to TRUE)

### Process output

Channels:	1
Output range:	0-20mA 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 (5 $\mu\text{A}$ )
Temperature drift:	Less than $\pm [0.4\mu\text{A} + 0.008\% \text{ of reading}]/^\circ\text{C}$ @ 99% confid (less than $\pm [0.2\mu\text{A} + 0.004\% \text{ of reading}]/^\circ\text{C}$ typically)
Output drive capability:	0 to 1k $\Omega$
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:	0-10V 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 $\pm [160\mu\text{V} + 0.009\% \text{ of reading}]/^\circ\text{C}$ @ 99% confid. (less than $\pm [60\mu\text{V} + 0.004\% \text{ of reading}]/^\circ\text{C}$ 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. $\pm 40\text{V}$
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

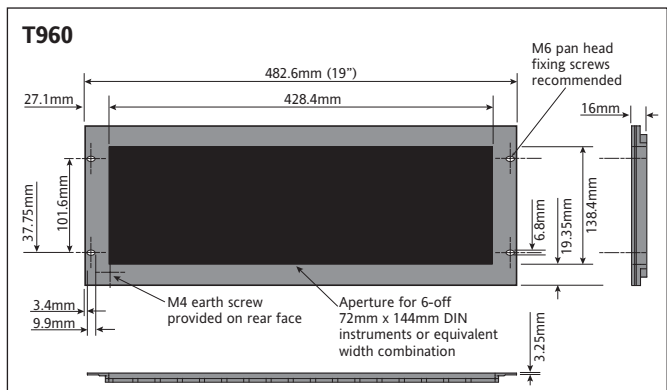
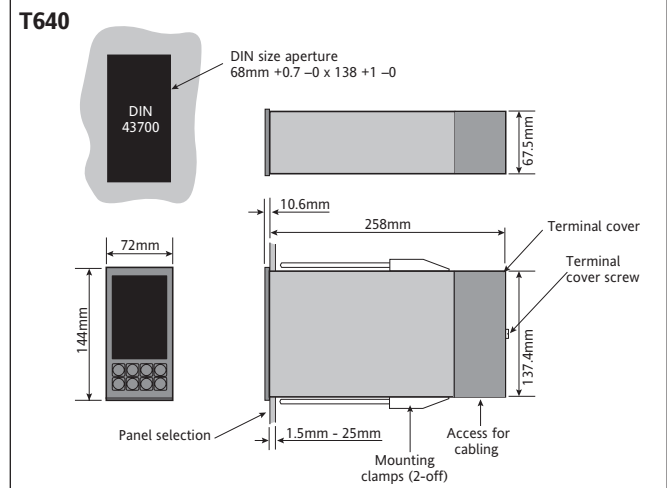
### Digital outputs

Channels:	3 (non-isolated)
Output levels:	software-selectable between: 24V internal or external pull-up (open-drain) 21.5-24.6V through 3.6k $\Omega$ 60V absolute maximum
Internal pull-up:	120mA maximum, <1V drop at 40mA
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 —appendix A

## INSTALLATION



## ORDER CODE

### T640 Loop Controller

1	2	3	4	5	6	7	8	9	10	11	12
T640								-			

#### 1 Basic Product

T640 Multi-function process controller

#### 2 Power Supply

MAINS Universal mains 90V to 265V ac RMS  
DC 19V-55V dc

#### 3 Serial Communications

422 RS422 Bi-Synch serial communications  
485 RS485 communications  
— Serial communications not required

#### 4 First I/O Board (Hi-Level I/O Board)

HI 0-5V or 0-10V input range automatically selected by database  
HG Jumpers set for 0-1.25V fixed input and output range  
HIB As HI but with internal burden resistors fitted  
HGB As HG but with internal burden resistors fitted  
TC Thermocouple I/O board  
— No board fitted in Site 1

#### 5 Second I/O Board (Hi-Level I/O Expansion Board)

HI Expands board specified in Site 1, with no burden resistor  
HG Jumpers set for 0-1.25V fixed input and output range  
HIB As HI but with internal burden resistors fitted  
HGB As HG but with internal burden resistors fitted  
TC TC thermocouple I/O board  
— No board fitted in Site 2

#### 6 Function

M001 2-loop  
M002 4-loop  
M004 4-loop plus SFC  
M006 Fixed function (includes T555 software and manual)  
M007 4-loop plus SFC + advanced function  
— No memory fitted

#### 7 Sleeve

T710 Supplied in a sleeve  
T750 T640/7950 adapter sleeve (dc power only)  
— No sleeve supplied

#### 8 Calibration Certificate

CERT Certificate required  
— No certificate required

#### 9 Factory Configured

— —

#### 10 Labels

EN English  
FR French  
GE German  
IT Italian  
SW Swedish  
SP Spanish

#### 11 Colour

GREEN Green  
BLACK Black

#### 12 Technical Support Charge

TS1 1 Hour Tech Support (default)  
TS2 2 Hour Tech Support  
TS4 4 Hour Tech Support  
TS8 8 Hour Tech Support

*Note Thermocouple board in slot 1 and high level board in slot 2 is not a valid combination*

### T640 Loop Controller used for 6360 emulation

1	2	3	4	5	6	7	8	9	10	11
T640								-		

#### 1 Basic Product

T640 Multi-function process controller

#### 2 Power Supply

MAINS Universal mains 90V to 265V ac RMS  
DC 19V-55V dc

#### 3 Serial Communications

422 RS422 Bi-Synch serial communications  
— Serial communications not required

#### 4 First I/O Board (Hi-Level I/O Board)

HI 0-5V or 0-10V input range automatically selected by database

#### 5 Second I/O Board (Hi-Level I/O Expansion Board)

HI Expands board specified in Site 1, with no burden resistor

#### 6 Function

M101 6360 emulation  
— No memory fitted

#### 7 Sleeve

T710 Supplied in a sleeve  
T750 T640/7950 adapter sleeve (dc power only)  
— No sleeve supplied

#### 8 Calibration Certificate

CERT Certificate required  
— No certificate required

#### 9 Factory Configured

— —

#### 10 Labels

EN English  
FR French  
GE German  
IT Italian  
SW Swedish  
SP Spanish

#### 11 Colour

GREEN Green  
BLACK Black

*Note When a T750 is required which enables T640 to function on the original 6360 slot in a 7950 rack the power supply must be ordered as DC.*

### T950 Security Key

1	2	3
T950		

#### 1 Basic Product

T950 Infrared security key

#### 2 Access

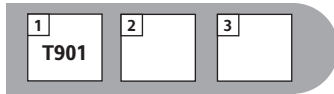
FULL Full access to all parameters provided  
PARTIAL Partial access to parameters provided

#### 3 Area

AREAn Key operates only instruments with area code 'n' or specify as 1 to 8  
— Key operates only instruments with '0' area code

## ORDER CODE (continued)

### T901 Memory Board (when ordered separately)



<b>1</b>	<b>Basic Product</b>
<b>T901</b>	Memory Board

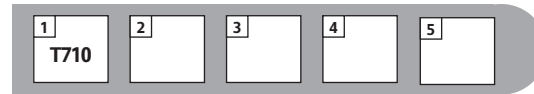
<b>2</b>	<b>Function</b>
<b>M001</b>	2-loop
<b>M002</b>	4-loop
<b>M004</b>	4-loop plus SFC
<b>M006</b>	Fixed function
<b>M007</b>	4-loop plus SFC + advanced function
—	No memory fitted

<b>3</b>	<b>Labels</b>
<b>EN</b>	English
<b>FR</b>	French
<b>GE</b>	German
<b>IT</b>	Italian
<b>SW</b>	Swedish
<b>SP</b>	Spanish

### T750 Adapter Sleeve

<b>T750</b>	T640/7950 Adapter sleeve
-------------	--------------------------

### T710 Sleeve for T640 (when ordered separately)



<b>1</b>	<b>Basic Product</b>
<b>T710</b>	DIN sleeve for T640

<b>2</b>	<b>Power Supply</b>
<b>DC</b>	19V-55V dc
<b>MAINS</b>	Universal mains 90V to 265V ac RMS

<b>3</b>	<b>Site 1 Connection Assembly</b>
<b>H</b>	High-level I/O
<b>D</b>	Direct plat I/O

<b>4</b>	<b>Site 2 Connection Assembly</b>
<b>H</b>	High-level I/O (only if H specified in Site 1)
<b>D</b>	Direct plant I/O
—	No board fitted in Site 2

<b>5</b>	<b>Labels</b>
<b>EN</b>	English
<b>FR</b>	French
<b>GE</b>	German
<b>IT</b>	Italian
<b>SW</b>	Swedish
<b>SP</b>	Spanish

## Panel Mounting Accessories

<b>T960</b>	19" x 7" rack frame
<b>T961</b>	Blanking plate (T730)
<b>T962</b>	IP65 Blanking plate (T730)
<b>T710B/Black</b>	Blank Fascia to fit T710/T720 sleeve Black
<b>T710B/Green</b>	Blank Fascia to fit T710/T720 sleeve Green

## ALIN Terminators

<b>LA082586U002</b>	100R terminating resistor plug-in terminal mounted for T640
---------------------	---

## High-Level mA Kits

<b>LA082728</b>	4-off double 250 ohm burden resistors plus 2-off burden diode plug-in modules for T640
-----------------	--



Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.



**UK Office**

**Keison Products,**

**P.O. Box 2124, Chelmsford, Essex, CM1 3UP, England.**

**Tel: +44 (0)1245 600560**

**Fax: +44 (0)1245 600030**

**Email: [sales@keison.co.uk](mailto:sales@keison.co.uk)**

Please note - Product designs and specifications are subject to change without notice. The user is responsible for determining the suitability of this product.